

Fruit and Vegetable Summit Proceedings



May 27-30, 2008 - Unesco, Paris

Presented by EGEA – IFAVA
Co-sponsored by the World Health Organization (WHO)
With the participation of the European Commission
With the support of the French Ministry of Agriculture
With the technical cooperation of the Food and Agriculture organization of the United Nations (FAO)

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EGEA – IFAVA



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SESSION 1

OFFICIAL WELCOME OPENING

S. Barnat, R. Lemaire, E. Riboli and S. Hercberg

KEYNOTE LECTURES

- The Role of Fruits and Vegetables in the Genesis of Noncommunicable Diseases. **A. Schatzkin**
- Riding Pillion with the Marlboro Cowboy. **G. Hastings** and **Gareth Broughton**

Ouverture

Saida BARNAT

Coordinator of the Fruit and Vegetable Summit, Head of the scientific department of APRIFEL, France

Mesdames, Messieurs, Chers Collègues, Chers Amis, bonsoir.

En tant que coordinatrice scientifique de ce 1^{er} sommet international des fruits et légumes, je suis très heureuse de vous souhaiter la bienvenue ce soir, à l'Unesco, symbole de la diversité des cultures mondiales et du maintien de nos héritages culturels et peut-être demain garant de nos gastronomies et cultures culinaires.

Il y a 7 ans déjà, Aprifel, l'agence française pour la recherche et l'information en fruits et légumes lançait une série de colloques scientifiques internationaux sur les bénéfices santé d'une alimentation riche en fruits et légumes.

L'objectif était de réunir les plus grands experts du domaine pour échanger, débattre et trouver des consensus scientifiques sur le rôle des fruits et légumes au regard de la prévention des maladies non transmissibles, tels que les cancers, les MCV, le diabète, l'obésité...

Depuis, les Etats, l'Union Européenne mais aussi l'OMS, ont défini des recommandations pour une consommation quotidienne minimale de fruits et légumes : 5 par jour, 6 par jour, 5 à 10 par jour selon les pays et au moins 400g d'après l'Organisation Mondiale de la Santé.

Parallèlement, de nombreux Etats à travers le monde ont mis en place des politiques nutritionnelles de santé publique encourageant la consommation journalière de fruits et légumes.

Néanmoins si chacun sait qu'il est nécessaire d'augmenter sa consommation de fruits et légumes, le passage à l'acte semble difficile. La connaissance ne suffit donc pas. La consommation ne suit pas et les comportements alimentaires en matière de fruits et légumes n'évoluent pas.

Ainsi, l'enjeu fondamental aujourd'hui n'est plus uniquement de savoir si les fruits et légumes sont bénéfiques pour la santé, l'enjeu est de parvenir à changer les comportements de nos concitoyens, et ceci au niveau mondial, régional, national, et même local.

C'est pourquoi ce premier sommet des fruits et légumes ne réunit pas uniquement des nutritionnistes, mais rassemble des chercheurs de santé publique, des spécialistes du marketing, de la communication, des sociologues et psychologues, des économistes et des politiques, des producteurs et des distributeurs, des élus... car l'enjeu est multi dimensionnel, la problématique est transversale :

Changer les comportements et l'environnement demande un travail collectif.

Tel est l'objectif de notre sommet...

Et nous sommes fiers d'avoir pu réunir aujourd'hui des représentants de toutes les parties prenantes liées à la consommation des fruits et légumes, représentant ainsi des secteurs complémentaires et des horizons si différents.

L'urgence d'une action concertée à l'échelle mondiale s'exprime également au travers du soutien que nous accorde les instances internationales FAO et OMS.

Et je tiens particulièrement à remercier le Bureau Régional pour l'Europe de Copenhague, le département des Maladies Chroniques et Promotion de la Santé et l'équipe de la Stratégie Mondiale d'alimentation, activité physique et santé de Genève. Mes remerciements vont aussi au groupe Récolte horticole, division de la production végétale et protection des plantes de la FAO.

De même je remercie, au nom des organisateurs, la Délégation permanente de la France auprès de l'UNESCO et en particulier Son Excellence Mme Bourgois, pour nous avoir permis de nous retrouver ici, dans ces locaux prestigieux des Nations Unies, pour affronter ensemble un problème de l'obésité qui affecte et menace toutes les cultures du monde.

L'année dernière lors de notre Conférence nutrition EGEA 2007 qui s'est tenue au siège bruxellois de la Commission Européenne sur le thème du « rôle des fruits et légumes dans la lutte contre l'obésité », de nombreuses solutions novatrices avaient été identifiées pour accroître de manière significative la consommation de fruits et légumes. Parmi l'ensemble de ces solutions, la priorité avait été donnée à trois domaines d'intervention principaux dont 2 seront particulièrement débattus au cours de ces prochains jours. Ces deux axes sont :

D'abord, favoriser l'accessibilité et la disponibilité des fruits et légumes à l'école : Ce sujet sera largement débattu le 29 mai et Lars Hoelgaard, directeur général adjoint à la DG Agriculture nous présentera les différentes possibilités à l'échelle communautaire. Nous traiterons également de l'accessibilité des F&L sur le lieu de travail. Le monde économique joue un rôle important dans l'aménagement d'un environnement plus favorable à la santé, en facilitant l'accès et la disponibilité des F&L. Vous trouverez dans vos malles une fiche traitant du sujet et qui émane d'un partenariat entre les pouvoirs publics et les différentes organisations du secteur des fruits et légumes. D'ailleurs, la proposition de la mise en place de ce partenariat émane de l'édition Egea 2004 qui s'était tenue à Perpignan.

Le 2^{ème} axe d'action défini à Egea 2007 concerne la réduction des inégalités sociales en matière de consommation de fruits et légumes : Nous y consacrons la journée du 30 mai, qui a été conçue afin de répondre à des questions aussi centrales que celle des modes d'intervention réellement efficaces (faut-il intervenir sur les subventions, les prix, la publicité, le marketing, les allégations nutritionnelles) que celle du rôle des responsables politiques, ainsi que de nombreuses autres questions qui j'en suis sûre, seront l'objet d'un débat passionnant, le 30 mai.

Quant' à la journée de demain, elle sera consacrée au thème de l'impact de la consommation de fruits et légumes sur notre bien être, sur la prévention de la prise de poids indésirable ainsi sur la prévention des maladies non transmissibles. Nous étudierons à cette occasion les possibilités de modifier un environnement dit « obésogène ».

Clairement, nous savons aujourd'hui qu'il ne peut y avoir d'alimentation saine sans fruits et légumes, qu'il ne peut exister d'équilibre alimentaire sans fruits et légumes et que la diversité alimentaire passe par la diversité des fruits et légumes. Encourager leur consommation constitue donc un véritable enjeu de santé publique.

Et je suis très heureuse de pouvoir ce soir remercier celui qui est à l'origine de la politique française appelée Programme National Nutrition-Santé, le Pr. Serge Hercberg, qui a accepté de coprésider le Sommet fruits et légumes. Je laisserai le soin au Prof Elio Riboli de nous présenter Serge Hercberg.

Je tiens à remercier tous les intervenants des 23 sessions de ce sommet pour leur engagement et leur collaboration et pour avoir répondu présents dès que nous les avons sollicités.

Mais s'il y en a un que je tiens à remercier tout particulièrement c'est le Pr Elio Riboli, qui a depuis 7 ans toujours été à nos côtés, présidé nos colloques et est de nouveau parmi nous ce soir en tant que co-président de ce Sommet.

Je tiens à souligner en outre que l'organisation de ce sommet mondial est le fruit d'une coordination étroite entre différentes associations nationales de plusieurs pays réunis depuis plus de 5 ans au sein de l'Alliance internationale pour les fruits et légumes : IFAVA, dont je tiens à saluer le travail remarquable et remercier ses membres.

En effet, la dimension mondiale du problème de l'obésité et de la sous consommation de fruits et légumes, nous ont amené à unir nos efforts et à créer une organisation internationale, dont le président est Ron Lemaire qui vient du Canada, que j'invite à la tribune. Merci de bien vouloir l'accueillir.

Introduction

Ron LEMAIRE

Canadian Produce Marketing Association, Ottawa, Canada

Good evening, welcome everyone. I'm going to be very brief in my comments. I would like to move on to hear some of our other speakers this evening, and to get the summit off to a wonderful start.

I would like to reiterate some of the comments that Saïda had made during her presentation on the importance of partnership. We could not have pulled together this event without the partners that Saïda had mentioned in her presentation, as well as members of the Organizing Committee, and the members of IFAVA. I'd like to thank you all again for your support, and the partners for enabling us to reach our goals in pulling together this event, and enabling you to come to Paris and enjoy the next 3 days of information.

The International Fruit and Vegetable Alliance is a fairly new organization, and I quickly wanted to just bring you through what we've done in the last few years. Launched in 2005, the IFAVA Group, the International Fruit and Vegetable Alliance, was basically created to do one core objective. A mission that was focused on the encouragement and fostering of efforts to increase the consumption of fruit and vegetables globally for better health, by supporting national initiatives, promoting efficiencies, and facilitating collaboration on shared aims and providing global leadership. This Summit is one of those core tactics to achieving the aims of global leadership and bringing together collaborative efforts to understand how we can increase consumption.

Beyond that, we've been very active on a yearly basis running specific programs that can support the consumption of fruits and vegetables for our members and the global marketplace.

After we launched in 2005, we began creating a monthly newsletter, a scientific newsletter, that goes out to a network of, right now with our media exposure in different markets, over a million through media, definitely within straight distribution in North America, we are looking at approximately 200,000-300,000 in total distribution. And beyond that in other markets, as well, through Europe. We are very proud of the newsletter, and Saïda is our scientific lead on that publication that supports our membership in their core activities around the science of fruit and vegetables.

As well, we created our scientific overview, which is a short document that outlines the scientific benefits of eating fruits and vegetables around pulmonary health and other areas. We've also had an international summit in 2006, similar to this event that brought together world leaders to discuss and focus on efforts to increase

consumption and the science behind it. We've been very fortunate to host a workshop in Brussels just last year focusing on policy and school snack programs, school fruit programs, and how we can try and move the agenda forward to have more national governments focused on supporting fruit in schools, or vegetables.

And this Friday, we will be launching a new tool, a practical toolkit, for countries that are looking at how they can develop 5-a-day type programs. It's something that has been a good year in development and it will be an online tool that you will see more on Friday during the midday session.

It's interesting; our membership has grown since that launch in 2005. Current national representation within IFAVA included Canada, United States, France, Denmark, New Zealand, Australia, South Africa, Peru, Japan, China, Argentina, and Chile. We are a member-driven organization. And I would encourage any organization or group that's here during the summit, to consider joining IFAVA and being a part of our international group. It's through the network and shared collaboration that we see the greatest strength.

An interesting comment was brought up earlier. When we have a tendency--being in Paris, unfortunately, with the weather, we don't get a chance to see the stars. But individually, looking up at the sky, we see many of the same things. Everyone looks up, we see the stars. As an individual, you interpret those stars in a very unique way. As a group, we have an opportunity to discuss what that interpretation is, and what those stars mean to you, and how those stars impact how you live.

Similar to this Summit, I'd like to take that approach of looking at the stars. Looking at the stars in isolation won't do us any good. As a collaborative group here, together, looking at the issue around fruit and vegetables, it's key that we do it together as a group and find solutions as a group. So again, as a group, I encourage us to work during the remainder of the week to find solutions towards how we can increase consumption of fruit and vegetable, globally. Thank you.

Saida BARNAT

Merci Ron,

Je voudrais maintenant vous présenter celui qu'il n'est en réalité plus nécessaire de présenter : Le professeur Elio Riboli.

Depuis 2005, Elio est Professeur d'épidémiologie du cancer au collège Impérial de Londres où il dirige le département d'épidémiologie de santé publique et premiers soins.

C'est en 1983 qu'Elio avait intégré le Centre international de recherche sur le cancer de l'OMS à Lyon où ses travaux de recherche se sont concentrés sur la relation entre nutrition, statut nutritionnel et cancer. C'est ainsi qu'en 1989 Elio a initié et coordonné la plus grande cohorte européenne EPIC, qui comprend 500,000 sujets venant de 26 centres appartenant à 10 pays européens.

EPIC fut initialement conçue pour étudier la relation nutrition/cancer. A présent, EPIC a évolué et élargi son domaine d'investigation aux maladies cardiovasculaires, à l'obésité et au vieillissement. Dans ce contexte, le passage d'Elio et de la coordination d'EPIC à la Faculté de médecine du Collège Impérial à Londres représente une évolution naturelle qui facilite cette nouvelle phase d'EPIC, dédiée à la recherche sur toutes les maladies chroniques les plus répandues

Elio je te cède la parole, merci à tous de bien vouloir l'accueillir.

Elio RIBOLI

Division of Epidemiology, Public Health and Primary Care, Imperial College London, UK

I would like to start by saying that if you are here once again in this new edition of EGEA, first of all it's because of Saïda's determination in keeping us all together in building up, I think, a very good scientific program. And I think the demonstration that you are here in participation prove the interest of this new edition. So Saïda, thank you for all your efforts.

And I would also say thank you to Aprifel that has, once more, supported this conference. I must say that I've been really delighted to see how Aprifel has provided all the support for us to get together to meet, to discuss, with complete and total independence, and how this can be cited as a fantastic example of sponsoring research, science, discussion about policy, in complete independence of the outcomes.

Again, I think EGEA has a particular role in the many meetings that there are around the world on nutrition and health. And one of the specificities is that from the very beginning - and this is thanks to Saïda and to Laurent Damien who have been organizing these meetings until last year - we have brought together researchers on the link between nutrition and health, cancer, cardiovascular diseases, but also policymakers, and the researcher's interest in the translation of research into public health. And this link between research, public health, and policymaking is extremely important.

And that helps me to introduce Serge Hercberg who, besides being a very good friend, is someone who has really been at the intersection of research with public health in an extremely effective way, he is recognized as being the father, and the mother of the National Program on Nutrition and Health that has been adopted officially in France, and is one of the models that are around, at least in Europe, on how public health can be translated into policy at the national level. Serge will, I think, address the audience in a moment.

I take advantage of being here to introduce the first of the two speakers, the keynote lecturer, Arthur Schatzkin. Arthur is the Director of the Nutrition Epidemiology Branch of the National Cancer Institute, United States. Arthur has attended a few of the previous EGEA meetings, and just a word to say that when Saïda said that EPIC is the largest prospective cohort study on nutrition and cancer, and she said in Europe, she was right. Because, in fact, Arthur has been working in this field for a long time, is leading what is now the largest worldwide prospective cohort study on nutrition and cancer that is based on the American Association of Retired Persons. If I am right, I think it includes 650,000 people. So we've been beaten by about 100,000 people by the AARP and NIH study which is a major project that has provided fantastic results in top journals over the past few years. So that says that when we started EPIC 15 years ago, and we aimed at collecting data from [...] subjects, we

knew that that was just the beginning. In fact, we need this very large study to have a better understanding of the links, complex links, between nutrition and health. And fruit and vegetables play a key role on this link. And the understanding of the relationship is not always easy. I would say on the contrary, it's rather complex. And these very large studies play a key role.

I would like to conclude by thanking all the organizers for making it possible for us to be here, and thank you for your presence. I look forward, as usual, with EGEA, to interesting presentations, with interesting discussion, and the final day, an in-depth discussion on how research results can be translated into public health. And I give the floor to Serge now.

Have we done the first hour of the meeting? Is it Serge or Arthur? It's Arthur. Okay, so it's Arthur, sorry.

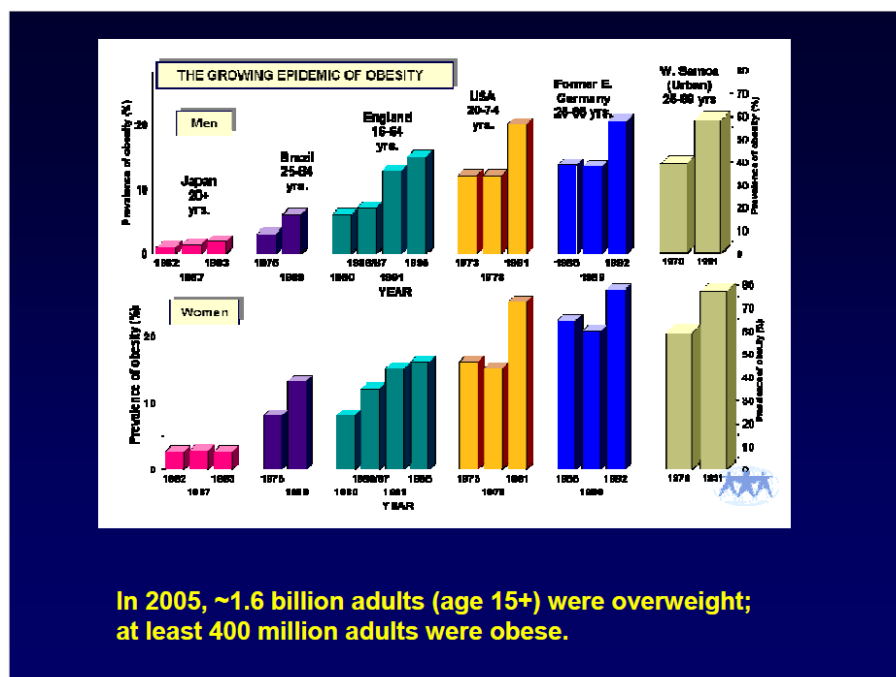
The role of fruits and vegetables in the development of chronic diseases

Arthur SCHATZKIN

National Cancer Institute, Division of Cancer Epidemiology and Genetics, Maryland, USA

What I'd like to do first is just say a little bit about why this is important. I'm going to show just a couple of slides from the World Health Organization, which gives an idea of the magnitude of some of these non-communicable/chronic diseases. And what you see here at the bottom is that over 7 and half million people died from coronary heart disease in 2005. More than 60% of the global burden of heart disease occurs in developing countries. With regard to strokes, over 5 and a half million people died a couple of years ago from stroke, and if you add coronary heart disease and strokes together, it adds up to 30% of the deaths around the world. And the stroke burden, as you see in the circle, is projecting a more than 50% increase in disability due to strokes worldwide. Over 7 and a half million people would have died from cancer in 2005. You see some of the leading anatomical sites, cancers of the lung, stomach, and colon. And again, with regard to the distribution in the world, more than 70% of all the cancer deaths in 2005 occurred in low and middle income countries. And finally, over a million people died of diabetes in 2005. And over 170 million people in the world have diabetes and the numbers are increasing. So that's some evidence on the global burden of chronic disease to which I am now going to try and relate fruits and vegetables.

Now, I can't talk about the global burden of disease without saying something about the obesity epidemic which you are going to hear more about tomorrow morning in the early session.



This slide depicts the epidemic of obesity, throughout the world, which is not simply restricted to developed countries. 1.6 billion adults 15 and over were overweight in

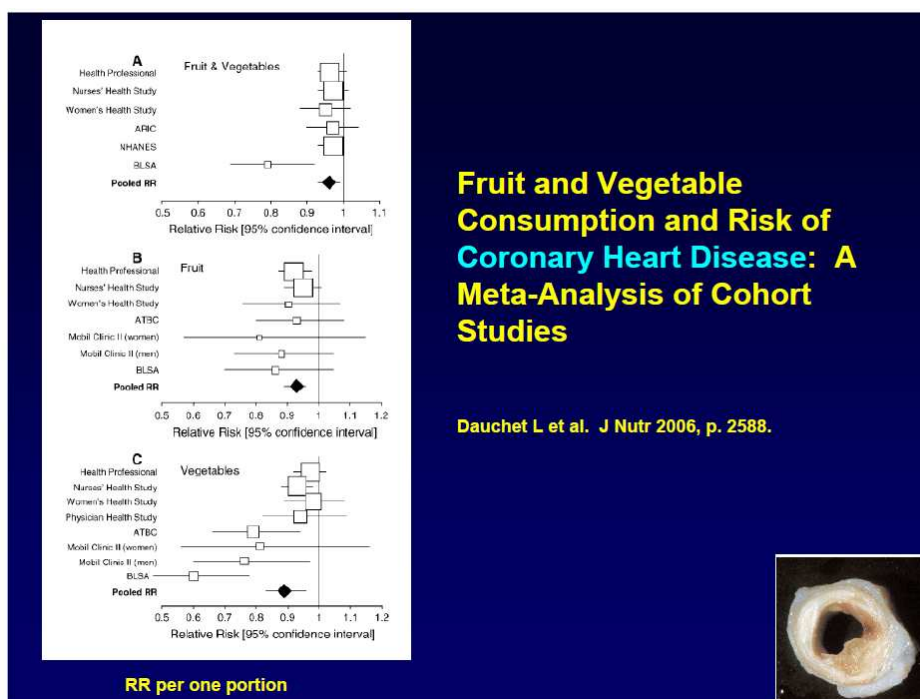
2005, and at least 400 million adults were classified as obese.

Now, this slide (of Moses-like figure carrying two tables, with onlookers asking,) *'what does it say about fruits and vegetables?'* There has been historical interest in the role of fruits and vegetables in preventing chronic/non-communicable diseases for some time. Now a key question is how do we know for a fact that fruits and vegetables do any good with regard to chronic non-communicable diseases. And there are all kinds of public relations commercial claims made, as you see here from a commercial for Lycopene or a book that I got out of my local drugstore about the foods that combat cancer. So, *how do we know, definitively, whether fruits and vegetables help prevent these diseases?*

Now, when one talks about fruits and vegetables, you can look at it at several levels. You can think about the specific nutrient biochemical components of fruits and vegetables. Here you see folic acid as an example. You can talk about particular vegetables or particular fruits, garlic as an example. You can talk about classes of fruits or classes of vegetables, say, cruciferi. And finally you can talk about fruits and vegetables in total, or fruits and vegetables. Now I'm going to focus my remarks in this short talk just on total fruits and vegetables. You'll hear more throughout the meeting on these other dimensions of the fruit and vegetable question.

Now, animal studies have been informative and continue to be. Ecologic data where, for example, you look at the correlation between the international distribution of diseases and rates of consumption or disappearance of foods, are also informative. But the strongest evidence on this question really comes from the individual-level epidemiologic studies. Either observational studies, particularly prospective cohort studies which are not subject to the recall bias effective retrospective case-control studies, or in some cases, intervention studies, randomized controlled trials in people.

Now I am going to show you a couple of slides that reflect recent meta-analyses that have been done from prospective cohort studies, individual level epidemiologic studies that had information on human diet. And first is a meta-analysis that recently appeared on fruit and vegetable consumption and risk of coronary heart disease.



And what you see here for fruits and vegetables total, then for fruits, and then for vegetables, you notice the black diamond is off to the left of the line that represents 1, which is a relative risk of 1, or no effect. This black diamond means that in summing up all these cohort studies, taken in the aggregate, there is a statistically significant protective association for fruits and vegetables, and fruits and vegetables considered separately, in these prospective cohort studies. And although the relative risk here doesn't look enormous, this is for 1 increment serving. So if we are talking about several increment servings, then the relative risk protection would be that much greater.

Here is a similar slide for another recent meta-analysis on stroke. And again, you see here the white diamond by and large, shows a protective association for fruits, not quite as strong for vegetables, and also for total fruits and vegetables, with respect to cerebral vascular disease, stroke.

There was a recent meta-analysis for diabetes. Here the evidence is not quite so strong or impressive. And the diamonds here are closer to the line representing no change in risk. And the confidence interval clearly includes 1. So for diabetes, in these prospective cohort studies, we don't yet have clear-cut evidence that fruits and vegetables are protective. And an interesting thing from one study that's recently come out (not a meta-analysis) is that for fruit juices there is actually an increased risk in diabetes, which is something I think you'll hear more about tomorrow.

Now, with regard to cancer, here, things are quite complicated, but quite important. You are going to hear tomorrow, in the cancer session, more detail about the recent report that came out from the World Cancer Research Fund/ American Institute of Cancer Research on diet, nutrition, physical activity, and cancer. This is the recommendation on plant foods, and this recommendation was based, not only on

cancer, but also on other non-communicable diseases: adults should consume a minimum amount of fruits and vegetables, 600 grams at the population level per day, and for individuals, at least 400 grams. But if you look at the report, what it says is that the evidence that diets high in vegetables and fruits protect against cancer is overall less compelling than in the mid-1990's, when most of the evidence was coming from retrospective case-control studies. Now, a number of the prospective cohort studies have provided data on this, and on balance, the data were less impressive. However, the scientific panel--and there are a number of people here who were a part of that group--did conclude that although the evidence was not convincing that vegetables and fruits protected against malignant disease, it was deemed sufficiently high enough to rate "probable," which was the minimum level for setting recommendations.

The essence of this slide is that when looking at vegetables across a number of cancer sites, the evidence from the cohort studies, in particular, but also from some case-control studies, was deemed probable. This goes for total vegetable in relation to cancers of the mouth, pharynx, larynx, oesophagus, and stomach; allium vegetables for stomach cancer; and total fruits for cancers of the mouth, pharynx, larynx, oesophagus, and lung. Here are the meta-analysis data showing the relation between vegetables and stomach cancer. Again, most of the data here that were most convincing were from the case-control studies, not from the cohort studies, which is a little troubling because of the potential for recall bias in the case-control investigations.

Let's look at the relation between fruits and lung cancer. There has been a consistent association between fruit intake and lung cancer, and we are even beginning to see that now in prospective studies among never-smokers, although the data there are very sparse. The problem with lung cancer is, as you might suspect, residual confounding with smoking. People who smoke tend to eat less fruits than people who don't smoke, and if you have even a little failure to properly control for smoking, then what you could be picking up as fruit protection could really be the smoking effect, which is clearly a much more potent risk factor than diet. And for colo-rectum, which was long thought to be kind of the key site in cancer that was going to be related to fruits and vegetables, the data were deemed limited or limited-suggestive for vegetables, fruits, and foods containing folate.

Now this is a slide I got from Walter Willett, a wonderful slide. It says, *"I can't remember anything anymore. I can't even remember what I had for lunch. I can't even remember what I had for supper. And I had dog food."* The clear message from this slide is, it is not easy to measure fruits and vegetables, what people eat in general, or fruits and vegetables in particular. And the error that comes from the typical instrument that's used in our epidemiological studies, the food frequency questionnaire, that error will, on balance, tend to dilute or attenuate true associations. So a true relative risk of 2, a doubling of risk for those in the highest level as opposed to the lowest level of fruit and vegetable intake, might be knocked down to a 1.2 or lower which

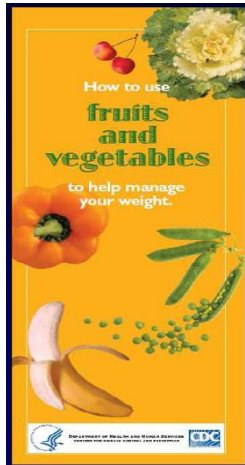
makes it very tough to detect that association with statistical significance. In addition, most of the instruments that are used for assessing diet have very little about preparation of fruits and vegetables, and very little on early life consumption of fruits and vegetables. And that plays a potential role in cancer prevention effects, and we don't have much data on that.

You are going to hear tomorrow from Mazda Jenab and his colleagues from EPIC tomorrow a very interesting study that recently came out on vitamin C and gastric cancer. When they looked at dietary vitamin C in the lower row there, measured from our typical questionnaire food frequency questionnaire, there was no association. You see the relative risk around 1, nothing going on there. But when they looked at blood levels of vitamin C, plasma vitamin C, there was a clear inverse protective association. And where is vitamin C coming from? It's coming from fruits and vegetables. And it suggests, perhaps, that our standard instruments are not measuring fruits and vegetables as well as we would like.

Now this is "Star Trek the Next Generation." And there has been a lot of discussion among epidemiologists around the world as to what the next generation of studies might look like, particularly to deal with this problem of dietary measurement error. And this is one example of an instrument that we're developing at NCI. It's an automated internet-based 24-hour recall. 24-hour recalls are generally considered to be superior measures of dietary intake, particularly if they are administered multiple times over the course of a year. The problem has been simply that they are way too expensive to use on an interviewer administered basis. There is also a similar effort that Dr. Hercberg is involved here in France, and perhaps in some other places around the world. This has real potential. And the beauty of these things is that aside from being very inexpensive to administer over the internet, you can have many, many more foods built into this instrument with a hierarchical list. So here you see cereals and energy bars. The participant then presses this and goes down to the bran flakes that you see there in blue. The respondent is then prompted to select foods, such as milk or fruit that has been added to the bran flakes. You can have, again, many thousands of foods and, many thousands of pictures on the internet that can be used to get a better handle on portion size, which is a potential contributor to the error in assessing fruit and vegetable intake. So we'll see if in the next generation, the coming years, whether these instruments can be incorporated in our prospective cohort studies, and whether it will make a difference in the level of evidence.

Now, a little bit more on obesity here. Obesity is clearly a strong risk factor for cardiovascular disease, for diabetes, and for cancer. And with regard to cancer, one of the things that came out from that World Cancer Research Fund, the American Institute of Cancer research report was: *the really potentially important role of obesity in the genesis of malignant disease.* And the conclusion was that the evidence that overweight and obesity increase the risk of a number of cancers is now even more impressive than it was in the earlier edition of that report in the 1990's. Since that time, rates of overweight and obesity in adults, as well as children, have increased in

most countries, as you've seen. And the evidence, just to give you a couple of examples: this is colorectal cancer. And down below there in pink is a little diamond that shows obesity, even overweight, increases the risk of colorectal cancer. The same thing for post-menopausal breast cancer. The meta-analysis was quite clear that obesity increases the risk of post-menopausal breast cancer. And even less frequently occurring, less common cancers like pancreatic cancer, are now being shown to be obesity-related malignancies.

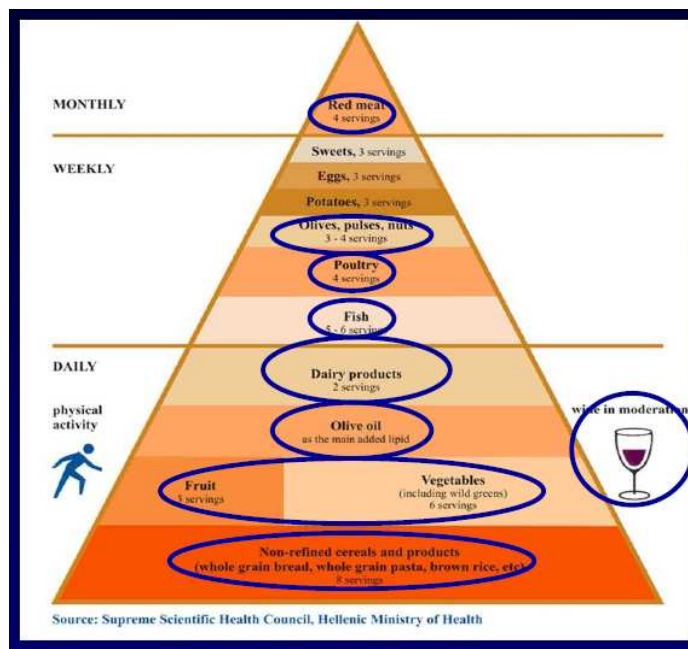


And the point of all this with the obesity element here, with reference to fruit and vegetable intake, is that fruits and vegetables can be an important aspect to weight control and weight management. And this is just the cover from a U.S. Centers for Disease Control pamphlet, it's called: How to Use Fruits and Vegetables to Help Manage Your Weight. And they have little pictures like this where they show that on the left is a bowl of corn chips, and on the right are 3 fruits and vegetables, and simply eating one or 2 of these is equal in energy intake to the chips, but can be just as satisfying, and this implies a role for fruits and vegetables in obesity, which is clearly related to cancer.

And finally, on dietary patterns. There have been some interesting studies that have appeared over the last several years where investigators, either in an intervention setting in a randomized control trial or in observational studies, have looked at overall eating plans or dietary patterns, of which fruits and vegetables played a major role. This is the DASH study, Dietary Approaches to Stopping Hypertension. And what you see is the fruit and vegetable diet down below along with the combination diet, which added low fat foods, made a substantial significant contribution to lowering hypertension which, of course, would have its impact in stroke and coronary heart disease. And here is the DASH eating plan which you can find on the web site derived from that trial, and you see here the specific recommendations for vegetables and fruits.

The Diabetes Prevention program, if you have not heard it, was a spectacular trial which showed that lifestyle interventions, particularly involving weight control and physical activity, but there was also a dietary component, and that dietary component did involve fruits and vegetables intake to reduce caloric intake. This lifestyle intervention reduced diabetes as you see in the survival curves on the right, compared to a drug regimen, and compared to placebo. The differences here are all statistically significant.

And finally, you've heard about the Mediterranean diet, and an element of the Mediterranean diet down near the bottom, is fruits and vegetables intake. Epidemiologists have created indices of the Mediterranean diet to be applied in different settings, and have related this in observational contexts to various non-communicable/chronic diseases. These are some data from the AARP study that Elio mentioned, looking at the Mediterranean diet and total mortality, all causes, cancer, cardiovascular disease, and other causes. And you see a protective association between people who consumed a Mediterranean diet with a high index, as opposed to those with a low index.



There is evidence that I don't have time to go into for other chronic diseases. Fruits and vegetables have been shown to have some protection for cataracts, for diverticular disease of the colon, and even for chronic obstructive pulmonary disease, particularly asthma.

Now, having shown evidence that makes the association, or in some cases, even shows effects in randomized controlled trials: *are there plausible pathophysiologic processes, mechanisms, to explain causal links between fruit and vegetable consumption and non-communicable diseases?* And the answer to that is clearly, yes. Among the many mechanisms that have been suggested for how fruits and vegetables could be protecting against chronic diseases are the antioxidants activity of a number of components of fruits and vegetables, prevention of nitrosamine formation, modulation of metabolizing enzymes that could be involved in the detoxification of carcinogens, a direct role in cell-proliferation and programmed cell death or apoptosis, and direct effects, potentially, on immune function.

There are mechanisms involving the fiber content of fruits and vegetables; insulin sensitization has been proposed as a fiber-related mechanism for fruits and vegetables. Several effects related to gastrointestinal physiology, including stool bulking with decreased carcinogen contact via the dilution, and possibly even increased motility. The direct binding of mutagens and carcinogens by fiber, and then the fermentation of certain kinds of fiber leading to short chain fatty acid production has been shown to have anti-carcinogenic effects. And fruits and vegetables may have anti-obesity effects and the anti-hypertensive effects, perhaps, also via calcium and other minerals.

So in summary, there is reasonably strong evidence, and that evidence may get stronger in the coming years, particularly as we incorporate new dietary assessment tools in our epidemiologic studies, that fruits and vegetables prevent chronic disease. And that you should eat your greens, even your yellows, and your reds that go along with that, so that you can eat right, live long, and prosper. Thank you very much.

Ceux qui ont organisé cette manifestation ont tout prévu pour que nous ayons des jours de grand intérêt sur un plan scientifique ; ils ont même commandé la pluie pour être sûrs que vous n'ayez aucune frustration pour ceux qui viennent de loin de faire du tourisme pendant ces jours-ci.

Je voudrais surtout remercier tous les organisateurs IFAVA, APRIFEL et l'ensemble des partenaires pour avoir organisé cette grande manifestation et je voudrais surtout rendre hommage au Comité Scientifique et surtout à la coordinatrice scientifique, Saïda Barnat, dont l'enthousiasme, la motivation, la ténacité, le pouvoir de conviction et le pouvoir de persuasion a permis de rassembler pendant ces trois jours, les grands experts mondiaux du domaine et nous a permis de mettre sur pied un programme de grand intérêt qui, je pense, répondra aux attentes de tous ceux qui sont aujourd'hui présents.

Je crois que ce programme scientifique qui nous attend est exemplaire à plusieurs niveaux. Il est exemplaire d'abord, parce qu'il est global. Il passe en revue les différentes approches et les tranches disciplinaires multi-dimensionnelles et s'en fait une grande richesse.

Il est *exemplaire* également parce qu'il est universel. On va aborder à la fois les problématiques des pays industrialisés, mais également des pays en voie de développement ; *universel*, par le fait que l'on va également s'intéresser aux problématiques à l'intérieur de ces deux contextes de toutes les populations : les enfants, les populations les plus défavorisées, les groupes à risque, les malades, etc.

Et enfin, je crois que ce programme est *exemplaire* parce qu'au-delà de la problématique spécifique des fruits et légumes qui fait l'objet de ce sommet, on retrouve ici tous les ingrédients de la démarche nutritionnelle de santé publique qui sert aujourd'hui à l'élaboration de politique nutritionnelle de santé publique.

On va, en effet, retrouver et ceci a été illustré par le merveilleux exposé d'Arthur Schatzkin, l'importance des connaissances, de l'état des connaissances issues de la recherche. Nous avons besoin aujourd'hui de recherches de qualité, d'expertises collectives, qui permettent de fonder les bases scientifiques sur des preuves suffisantes pour à la fois fournir des éléments d'objectifs nutritionnels de santé publique pour les décideurs en santé publique au niveau de populations et servir également de base pour les recommandations nutritionnelles qui elles, sont applicables au niveau des individus. Donc, je pense que l'on va largement revenir dans les sessions qui viennent sur ces aspects scientifiques, sur l'importance et la qualité des recherches qui sont aujourd'hui disponibles dans ce domaine et qui permettent donc, à la fois, de fixer des objectifs et des recommandations nutritionnelles.

Bien évidemment, il ne suffit plus en terme de santé publique de considérer que l'on a terminé le travail une fois que l'on a fixé des objectifs de santé publique, que l'on a défini des recommandations nutritionnelles, encore faut-il mettre en œuvre les moyens nécessaires pour faire tendre les populations vers ces objectifs ou tendre des individus vers ces recommandations nutritionnelles.

Ceci est complexe, bien évidemment – je n'apprends rien à personne – il faut mettre en place de véritables politiques qui associent des actions, des mesures, des régulations, voire des réglementations ou des lois sachant qu'il n'y a aucune action universelle dans le domaine des fruits et légumes comme dans d'autres qui soit seule efficace ; faire une campagne de promotion des fruits et légumes à elle seule n'est sûrement pas suffisante, interdire comme nous l'avons fait en France les distributeurs de produits de « snacking » dans les enceintes scolaires n'est sûrement pas efficace à elle seule, distribuer des coupons fruits et légumes à des populations défavorisées ne résout pas l'ensemble des problèmes ; bref, aucune action n'est efficace à elle seule, mais c'est la cohérence, la synergie et la complémentarité de l'ensemble de ces actions qui peut permettre de tendre vers les objectifs de santé publique, amener les populations à suivre les recommandations nutritionnelles. C'est bien évidemment sur la base de la compréhension, les déterminants des comportements nutritionnels alimentaires de l'état nutritionnel, de l'état de santé, que l'on peut bâtir ces politiques nutritionnelles, ceci veut dire que comprendre nécessite d'avoir des approches qui ne sont pas que celles du domaine biomédical, nous avons besoin de faire appel à d'autres approches, notamment celles des sciences humaines et sociales pour à la fois mieux communiquer auprès de la population, mieux informer, mieux former, former les professions relais, les professionnels de santé, d'éducation, de la recherche ou du monde social ; agir également sur l'environnement alimentaire, c'est-à-dire à la fois l'offre alimentaire qui est faite auprès de nos concitoyens, ce qui touche le domaine de la production, la régulation économique des filières, etc. Il faut également, donc, pouvoir faire appel à des approches qui touchent celles du domaine de la science du comportement, et je crois qu'à l'intérieur des journées qui nous attendent, on va retrouver cet équilibre entre les sciences biomédicales qui fournissent les recherches, qui permettent d'évaluer les actions elles-mêmes et de servir de support à nos actions et puis tout ce qui permet de mieux comprendre les déterminant sociologiques, culturels, économiques, psychologiques, et toutes les applications que ceci veut dire en terme de politique nutritionnelle de santé publique.

Pour introduire la deuxième partie de cette séance inaugurale, et notre collègue Gérard Hastings, je voudrais rappeler que « Marketing social » fait partie justement de cette dimension qui vient contribuer à faciliter l'orientation des décideurs en santé publique pour comprendre ce qui peut intervenir, ce qui peut conditionner, réguler, les comportements alimentaires de nos concitoyens.

Je crois que l'on va voir aujourd'hui à travers l'exposé de Gérard Hastings une démonstration de l'intérêt du « Marketing social » ; le mot « Marketing » a souvent une connotation négative auprès du monde scientifique. Le « Marketing social » c'est

bien sûr une dimension beaucoup plus positive qui aide à l'action de santé publique et donc, j'ai le grand plaisir et le grand honneur d'annoncer la conférence de Gérard Hastings.

Tout ceux qui font de la santé publique, que ce soit dans le champ du tabac, de l'alcool, des médicaments ou de l'alimentation connaissent bien Gérard Hastings. On connaît les « Rapports Hastings » ; d'ailleurs, en France, on connaît surtout « Rapport Hastings », ce qui fait que pendant très longtemps un certain nombre de personnes pensait que Gérard Hastings, son prénom, c'était « Rapport » parce que l'on utilise en permanence ses extraordinaires rapports qui ont été faits sur les déterminants d'un certain nombre de phénomènes qui induisent les comportements de nos concitoyens. Nous sommes actuellement en France au niveau du Ministère de la Santé dans une situation de débats très complexes avec le monde des opérateurs économiques pour la régulation, voire l'interdiction de la publicité télévisuelle destinée aux enfants et l'on a beaucoup travaillé en s'appuyant sur le remarquable travail, un rapport qu'a fait Gérard Hastings pour la FSA en 2003.

Donc, j'ai beaucoup de joie de présenter Gérard Hastings qui est Professeur de « Marketing social », il nous a dit qu'il était écossais et qu'il reconnaissait dans le temps parisien certains éléments du contexte qu'il connaît bien outre-manche. Gérard Hastings est surtout Professeur de « Marketing social » à l'Université de Stirling, il a de nombreuses fonctions, il a travaillé pour la Chambre des Communes et pour énormément de structures nationales britanniques, mais également internationales au niveau de l'Organisation Mondiale de la Santé et d'autres instances internationales, les travaux qu'il a conduits, qu'il a coordonnés, les synthèses des travaux qu'il a réalisées sont donc de merveilleux outils pour l'ensemble des chercheurs en santé publique et de nutrition de santé publique et je suis tout à fait ravi qu'il ait choisi pour cet exposé introductif de montrer le « Marketing social » sous un angle qui ne soit pas d'ailleurs directement celui de l'alimentation, même si le lien avec l'alimentation sera rapide, puisqu'il a décidé de prendre l'exemple du tabac : quelles leçons peut-on tirer de la promotion du tabac ? On a toujours intérêt à aller regarder ailleurs ce qui fonctionne et l'on sait que dans ce domaine, l'industrie du tabac a développé des méthodes extrêmement efficaces et il y a eu d'ailleurs d'autres méthodes efficaces qui sont aujourd'hui développées.

Je vais immédiatement passer la parole à Gérard Hastings en le remerciant pour cette introduction et d'être parmi nous pendant ces trois jours. Je vous demande comme le veut la tradition demandée par Saïda de l'applaudir bien fort. Je vous remercie.

Riding Pillion with the Marlboro Cowboy

Gerard HASTINGS

Institute for Social Marketing Stirling and the Open University Stirling, Los Angeles, USA

Bonjour Mesdames et Messieurs.

J'ai beaucoup de plaisir à être ici à Paris et de m'adresser à cette conférence très importante. D'abord, il faut remercier les organisateurs pour avoir donné ce temps typique d'Ecosse. C'est la même pluie, mais un peu plus chaude, peut-être. Cet après-midi, je vais dire quelque chose sur le marketing ; de temps en temps, on pense que le « Marketing » est un problème, mais aussi peut-être qu'il peut nous aider. J'en ai terminé avec le français. Maintenant, je vais parler en anglais.

The organizers asked me to look at tobacco and the lessons we can learn from tobacco, both in terms of how tobacco, itself, has been promoted, but how public health can use similar techniques to benefit people's lives and well being. And no better role model to take in the promotion of tobacco than the Marlboro cowboy. So I suggest that we saddle up and enjoy the ride.

A couple of introductory thoughts. I hardly need to say this, but obesity is clearly a major threat to public health. A threat to which we have to respond. We have to reach out to people to gain their trust, to help them to change their behavior. The question then follows, *who has succeeded in doing this? Who can we learn from, who can we turn to who has made progress in gaining people's confidence?* I think we know the sorts of people who have succeeded. Food companies, the alcohol companies, the tobacco companies, all the companies that sell the brands that have such a powerful hold on people's lives. A hold, indeed, that becomes particularly great if your life is otherwise lacking in excitement or hope, particularly if you live in poor and disadvantaged communities.



These are the people who have influenced key health behaviors, their smoking, their drinking, and their diet. And we know they have done this because we have done the research, we, in public health, have shown that their activities do influence people's health behaviors. And it's crucial to recognize that these are all voluntary behaviors. Nobody is compelled to smoke, nobody is compelled to drink, and nobody is compelled to eat energy-dense food. They are encouraged, but not forced. And their decisions and the lifestyles they then lead have a massive impact on their quality of life. So there is a great deal, potentially, we can learn from this.

I don't know whether people have seen the film, "Thank You for Smoking." But there is a scene in that where the hero of the film, anti-hero perhaps, who is here on

the right, who is a spokesman for the tobacco industry, is having lunch with 2 colleagues, one from the alcohol industry and one from the armaments industry. And they are showing off about who has the most lethal product. And the armaments manufacturer goes first and says he kills 100,000 people a week. And the alcohol company goes second and says, nothing compared to us, we can do 200,000 a week. But the tobacco man laughs at them both and says that they kill billions. Beat that. So yeah, the tobacco industry is the best at this. So it's them we should turn to for advice.

The question then becomes, *how should they do it?* And that was my brief, I was asked to look at how the tobacco industry does this. And I thought hard about preparing the presentation, and it occurred to me that I'm not really the best person to give this. What we need is somebody who works in tobacco to talk to us, because they know what they are doing. We, in public health [had] [to assess] a lot of documents that have been uncovered, so we do have some good ideas. But best of all with the people would be the people who actually do it.

Now I'm delighted to say that I've been able to persuade the chief executive of a tobacco company, New Way Tobacco, Gareth Broughton, to address this Conference. At first he was a little reluctant because he thought at a public health gathering, you might not be very sympathetic to him. But then I pointed out that it was a fruit and vegetable summit, and tobacco is, after all, a vegetable /// [chuckles] /// and at that point he succumbed and he agreed to come along. So ladies and gentlemen, I'd like you to give a polite welcome to Mr. Gareth Broughton, the Chief Executive Officer of New Way Tobacco.

Gareth BROUGHTON

Chief Executive Officer of New Way Tobacco

Good afternoon ladies and gentlemen, it's a pleasure to be here in Paris, it's a pleasure to be addressing this Conference. Three things I want to talk to you about. I want to talk about our successes, I want to talk to you about our methods, how we achieved this phenomenal success, and I want to talk about your weaknesses, your failures.

First of all, our successes: these are our company results for just last year. Cigarette volumes up 7%, net revenue up 4%, to just over three thousand million pounds, profits from operations up 9%, earnings per share up 12%. If you want a good pension fund, invest in our company. Dividends per share, up 12%. And if you don't believe our figures, consult any financial advisor you like. Every one will emphasize what a fantastic investment tobacco is. And it's a fantastic investment because we are so damned good at our job. Just one quote here: "In the long run, in our opinion, the economics of tobacco remain extremely attractive." Not my words, but those of the [...] group investment specialists.

So we are succeeding. *And how are we getting this success?* It's about marketing. And marketing, in turn, is about your consumer, understanding them, seeing the world as they see it. For us, there are 2 key groups in the U.K. Low income groups because poor people tend to smoke more than rich people, and young people. I'm going to concentrate just on one of these, on young people.

Why are young people so important to us? They are vital to our future success. 80% of smokers start before the age of 18. On average, they will do a pack a day for 25 years. That's worth just less than 50,000 pounds to us, 60,000 Euros, if you prefer. And we succeed in getting in touch with these people and doing business with these people because we recognize the importance of consumer-orientation of empathizing with their needs. And to do that, we have to do market research. We have to do it well, we have to do it using many methodologies, and we have to do it all the time.

Crucially, what we are trying to uncover is their needs. Particularly, *what do they want from smoking, what concerns, anxieties, hopes, do they have? And how can tobacco contribute to the fulfillment of those?* And if you talk to people about their smoking, particularly young people, it's very clear that this is about a rite of passage. To smoke Marlboro Lights represents having passed a rite of passage; it's not something done by immature smokers. It's about reassurance. Young adult smokers are looking for reassurance that they are doing the right thing. The cigarette is no exception. Young adult smokers are also searching for an identity. Cigarettes have a key role to play as an ever present statement of identity. So we have a complex of needs here which are about psychosocial and emotional needs. It's about coping with life. Something I submit to you, ladies and gentlemen, that you in public health understand very poorly, indeed. I will come back to that.

And we cater to these needs using not just advertising, as people tend to think, but a selection of tools. Yes, promotion is important. But also distribution, pricing, and product development, itself, of course.

So advertising, then. This is a quote about one of our campaigns for a brand



of ours called Lamberton and Butler, L&B in this slide. This will be the result of the current image-building campaign. This brand needs an infusion of style, coolness, and aspiration. So what you see, ladies and gentlemen, when we talk about communications, very often what we mean is association, imagery, the linking of feelings with particular products. Advertising, of course, takes in various forms of communication, in this case, sponsorship. I stress, this is not an advertisement, and this is a piece of editorial in a youth magazine from the U.K.

Place, distribution, terribly important. Being at the point of sale, being obvious at the

point of sale, especially for the independent retailer, sometimes called colloquially in English, “the corner shop.” It’s important to us because 80% of fewer than 16s buy the cigarettes from here.

Price is also important. Smoking cigarettes for young people is all about image and brand. They want premium brands. But premium brands are expensive. So one way they can square that circle is to buy smaller packs. Ten-packs. As this quote from one of our market research agencies shows, “As the lay-down price of cigarettes have increased, the youngest adult smokers may have traded down to a ten-pack of a premium brand, or chosen to buy a premium ten-pack when they entered the market.

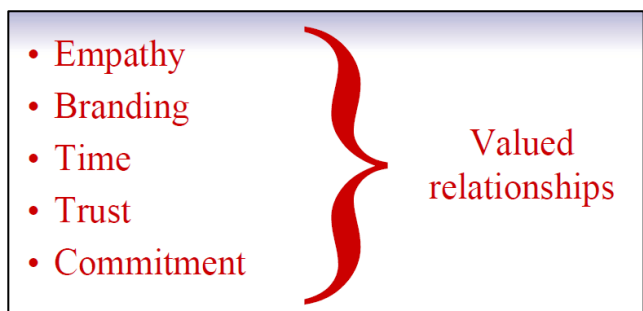
Product, itself, product design, is terribly important. In this case, we were thinking about a cigarette aimed at young men. The opportunity exists there for a male targeted brand, perhaps co-branded with Loaded, a young man’s magazine in the U.K., or with scantily clad women on the cigarette paper. The potential to target just the product, itself.

So these 4 strands, the promotion, the place, the price, the product, pull together into building evocative brands. The brand of cigarettes does not convey much in the way of image values, the way of well-being, and so many little reasons for the young adult smoker to persist with or adopt the brand. And building such brands takes time. You can see from the state of this man’s portable telephone that it’s an old, old advert. But the brand is perfectly recognizable. 50 years on, everyone in this room will recognize that brand.

And that speaks to a fundamental change that came about in marketing several decades ago now: the move from transactions, towards building relationships. The emphasis in marketing has moved from doing transactions and doing things to people, to building relationships with and doing things with people. Commitment and trust is central to successful relationship marketing. This is about being in it for the long game, being on your customer’s side, and doing for them the things that will make their lives better. It’s about empathy, it’s about brandings, it’s about time, it’s about trust, it’s about commitment, and it’s about building valued relationships. Furthermore, I focused for the moment on young people, but we need to think way beyond that, as well. All sorts of groups in society that we, as a tobacco company, need to build relationships with.

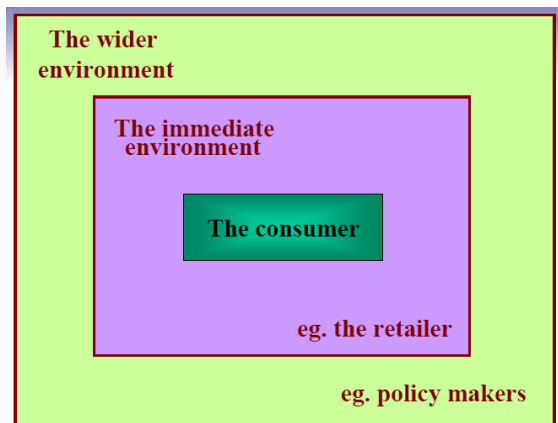
So the retail sector, we already touched on, very important, not that we are just in those shops, but that we build good, solid relationships with the retailers, themselves. So again, some of our market research,

[Carition], our market research company, has conducted research among



independent retailers in order to inform the development of communications with independent retailers. The global objective of this research is to aid the optimization of these communications as a step towards maximizing sales through the independent sector. So we need to curry favor with potential allies, shopkeepers, the hospitality trade, and the advertising industry. All of these industries have some interest in common with ours, and because we have interests in common, there is a potential for us to build relationships with them.

We also look beyond that immediate environment to the wider environment, the



social milieu, society as a whole. People like policymakers. We know our reputation matters; we know we have been the subject of much, much vilification and criticism in recent years. So we have put enormous effort and resources into corporate social responsibility, getting ourselves in projects that no one could possibly criticize. And this is important because we want to maintain and build our reputation. We want opinion leaders to like us, we want

policymakers to like us, we want the media to like us, and we want politicians to like us. We'll even go higher than that in our aim to build relationships with the rich and the powerful.

Let me finish by turning to your weaknesses, which are many and various. Two, I will focus on: marketing remains a complete mystery to you. Secondly, you have no plan.

Marketing, first of all. As I have said, it's about empathy; it's about feeling for people. With the consumer, for example, what do you do? You hector and you patronize. You've no sense of perspective. You've forgotten what pleasure is. That life is difficult, dysfunctional, and dysfunctional coping strategies have their place, that people have lives, not just inconvenient behaviors.

The stakeholder you've forgotten, too, that they have other priorities. For them life, too, can be difficult. That deals and compromises are needed, that there isn't one true path.

The business sector, you forget that it is them who create the wealth. Without the business sector, there is no wealth, there are no taxes! And for most of the people who work in the public sector, or the third sector in this room, they pay our wages. Your wages.

Ladies and gentlemen, you are zealots. What is more, you have no plan. No vision. What link is there between your present, your identity now, and 10 years ago? Where are your brands? I don't think you have a clue about where you want to be in 5, let alone 25 years time. You have all the coherence of strategic vision of American

foreign policy.

Finally, ladies and gentlemen, we are successful. Marketing drives our success. This remains a complete mystery to you. Thank you for listening.

Gerard HASTINGS

I'll return to my former self, which is a relief. A couple of points. First of all, clearly food is not tobacco. In an ideal world, tobacco will be a thing of the past. Clearly, that is not true of food. Nor would I say we are the fools Gareth Broughton says that we are. Nonetheless, I think what he said in this presentation; there are some key lessons for us.

First of all, that one about consumer orientation, we do need to understand the world from the point of view of the people we want to influence, we want to do business with, and we want to link up with. We need to understand their needs, and we need to understand that sometimes their needs are not just literal ones for better health or for long life, but emotional, complex psychological needs. That sometimes doing unhealthy things satisfies needs that public health is, perhaps, a little remiss in not recognizing.

We need to think well beyond communication. We, too, have a marketing mix. We need to think about products, we need to think about distribution, we need to think about pricing. We need to think about our brands. We need to think about linking up with people and building relationships. What is absolutely for sure, whatever the solution to the obesity crisis is, it is a long term solution. There are no quick fixes here, no transactions that are going to solve this. The only way we are going to do it is by building relationships, both with customers and stakeholders, and getting in there for the long haul.

And stakeholders are vital. The context in which people make their decisions have a crucial influence on the success or failure of those decisions. If people want to eat fruits and vegetables and they can't get it in the local shop, they are not likely to succeed. If they can't afford what's in the local shop, they are not likely to succeed. If they go in the local shop and the fruits and vegetables are tucked away in the back and all the chocolates in the front, they are less likely to succeed. And so on and so forth. So the context is vital.

We do need to engage in competitive analysis. Tobacco is not food, Nestlé is not Phillip Morris, but nonetheless, we need to look at what the food industry is doing, and we need to comment on it, we need to critique it, and if necessary, we need to regulate it. Above all, we need to think about strategic planning. We need goals, we need objectives, we need to be able to measure and track our progress towards a successful fulfillment of those objectives and a successful achievement of our goals. That is all about thinking through what we intend to do over the next few years, and

setting clear markers and milestones so we can map our progress towards it.

Finally, then, ladies and gentlemen, marketing has made New Way Tobacco very rich. It can help us to keep thin. Once again, thank you for listening.

Conclusion

Saida BARNAT

Founder of EGEA, Scientific director of APRIFEL, France

Ces interventions introductives nous ont permis de **saisir l'enjeu et les objectifs des travaux de nos 3 jours à venir**. J'ai déjà le sentiment que la réflexion sera riche et que nous allons proposer des idées nouvelles d'action pour le futur.

Mais avant de nous quitter permettez-moi de remercier tous les membres du comité scientifique qui ont travaillé efficacement à la relecture des résumés de posters que nous leur avons soumis.

Merci à toutes les personnes qui ont soumis un poster et qui sont parmi nous ce soir. Je salue également ceux dont le travail a été approuvé mais qui n'ont pas pu se joindre à nous et leur présente toutes mes excuses pour ne pas avoir pu les aider à trouver les fonds nécessaires à leur présence.

Merci à tous nos partenaires qui nous ont fait confiance et accordé leur soutien à ce Sommet International des Fruits et Légumes, qui je l'espère, sera à la hauteur de vos attentes.

Encore un mot pour demain matin, notre première session plénière commence à 8h45. Je vous remercie d'avance pour votre ponctualité et votre prévoyance : qq minutes d'avance seront nécessaires pour le passage de la sécurité à l'entrée. Et surtout n'oubliez pas que votre badge permettra pendant les 3 jours l'accès à l'Unesco et demain à la mairie.

Merci encore à vous tous d'être là ce soir!

Je vous invite à présent à prendre l'ascenseur, ou mieux encore les escaliers car l'activité physique est une autre recommandation nutritionnelle à suivre. Nous sommes attendus au 7^{ème} étage où vous pourrez apprécier un cocktail de bienvenue...

SESSION 2

F&V CONSUMPTION TO REDUCE OBESITY: GLOBAL PROSPECTIVE

Chairs: **Ph. James** and **B. Rolls**

- Introduction. **Ph. James**
- The impact of F&V on public health. **C. van Rossum**
- Diet quality/lifestyle and low energy density. **H. Schroder**

Strategies to enhance satiety with F&V: implications for weight management. **B. Rolls**

Introduction

Philip JAMES

LSHTM & IOTF/IASO, London, UK

This first session is all about fruit and vegetable consumption to reduce obesity. I thought that perhaps I would talk about things that do not normally interest people in Europe but are now an enormous significance.

The ten leading causes of death in Low and Middle / High income countries

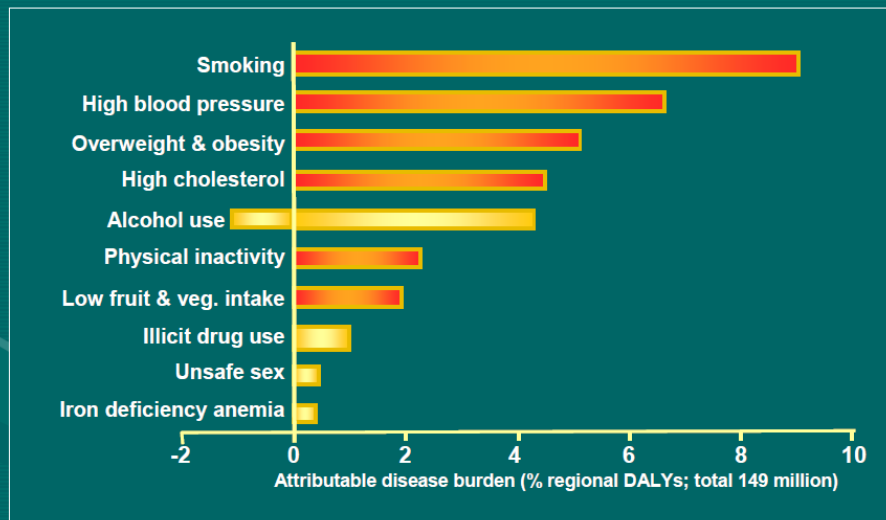
Low- and Middle-income countries				High-income countries		
	Cause	Deaths (millions)	% total deaths	Cause	Deaths (millions)	% total deaths
1.	Ischemic heart disease	5.70	11.8	Ischemic heart disease	1.36	17.3
2.	Cerebrovascular disease	4.61	9.5	Cerebrovascular disease	0.76	9.9
3.	Lower respiratory infections	3.41	7.0	Trachea, bronchus & lung cancers	0.46	5.8
4.	HIV/AIDS	2.55	5.3	Lower respiratory infections	0.34	4.4
5.	Perinatal conditions	2.49	5.1	Chronic obstructive pulmonary disease	0.30	3.8
6.	Chronic obstructive pulmonary disease	2.38	4.9	Colon and rectal cancers	0.26	3.3
7.	Diarrhoeal diseases	1.78	3.7	Alzheimer's & other dementias	0.21	2.6
8.	Tuberculosis	1.59	3.3	Diabetes mellitus	0.20	2.6
9.	Malaria	1.21	2.5	Breast cancer	0.16	2.0
10.	Road traffic accidents	1.07	2.2	Stomach cancer	0.15	1.9

Amplified by excess weight

WHO / World Bank. *Global Burden of Disease*. Lopez et al., 2006

If you look at the causes of death in the world, on the right at the top, you have the affluent world i.e. Europe and North America where the primary causes of death are heart disease and stroke. On the left are the causes of death in the poorest countries of the world and it is heart disease and stroke again at the top. If you look in detail at that first column you will see that 4-5 times as many people die of cardiovascular diseases in the poorer countries as in the affluent west and if you go down we have a series of problems on the right relating to cancers and diabetes. Those in orange are amplified by the risk of obesity which is the subject of this morning's session.

The top risk factors underlying the disease burden of high income countries (all preventable)



WHO / World Bank. Global Burden of Disease. Lopez et al., 2006.

If you take the latest data from the World Bank overweight as a cause of all the diseases of the affluent world is now number 3 in the order of risk factors. Five years ago it was number 6 so the whole issue is escalating.

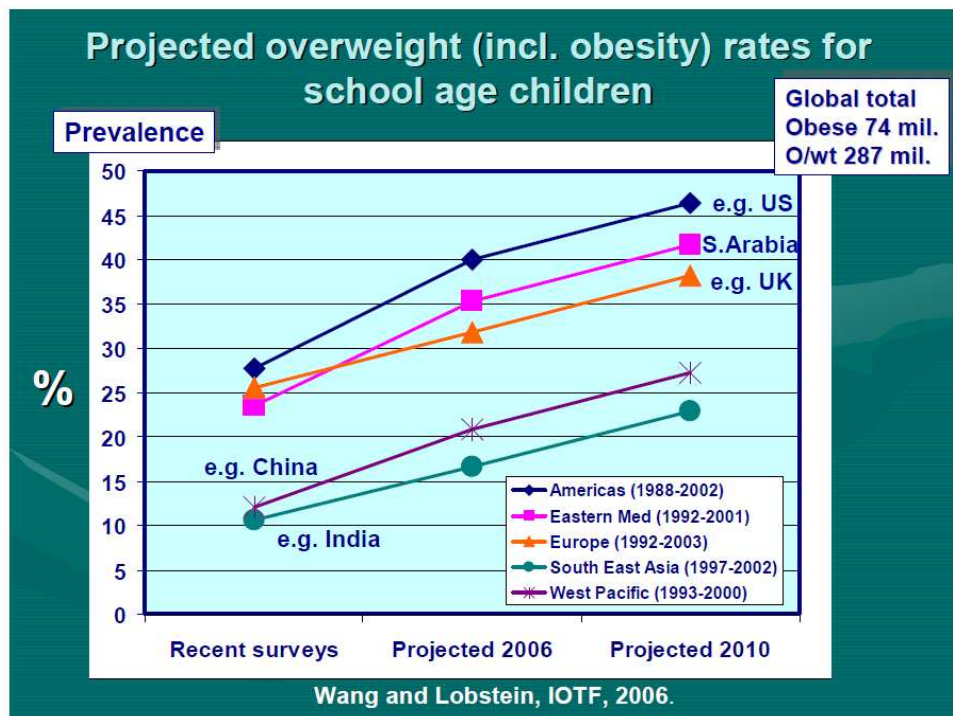
Here is an overview of the latest, one month old, adult overweight and obesity data in different global regions, with the age related rates going up into old age. You will see in red the obesity rates go up remarkably in early adult life wherever you are. We talk about children's obesity which is also important but then consider the age of onset of heart diseases and strokes in the fifty and sixty year olds. In practice the development of those diseases is well on the way throughout adult life as weight goes up so we are dealing with a massive public health problem. Everybody knows that North America is the worst region in the world for many things, actually for women in the Middle East obesity is a bigger problem and Latin America is catching up. Please note that the total overweight and obese involve over 60% and up to 80% of the population. In other words, the majority of the middle age population of the world is too heavy, whether we are talking about the data from women or men. It is quite extraordinary that we do not have a true perspective on what is happening in the world.

The data on adults are clear but Tim Lobstein and Rachel Leach also put together about five years ago data on children using the International classification where in effect 10% of the world's children were then classified as overweight or obese.

Now, however there are astonishing increases, the highest on, for example, is Bahrain in the Middle East. In fact Spain, Portugal and Latin American countries as well as the Caribbean, are really trying to beat the United States children's obesity rates. The latest data now show that children in most regions have rates above the average 10% global value of 5 years ago. Only Africa is just below 10% whereas

Africa previously was almost not on the map at all. So we are dealing with a speed of obesity development which is truly astonishing.

You will hear later about the higher obesity rates in the poorest people, but this is also true for children at least in affluent societies. When we then consider the time of onset of the obesity epidemic the only data we have across a century are from Australia with over 100 years of analyses revealing that the obesity rate goes up in the 1980's. So something astonishing has been going on in front of our eyes and we have not actually got a grip on it. And in fact, throughout the World - in America, in the Middle East, China, India or Europe, you see the same phenomenon.



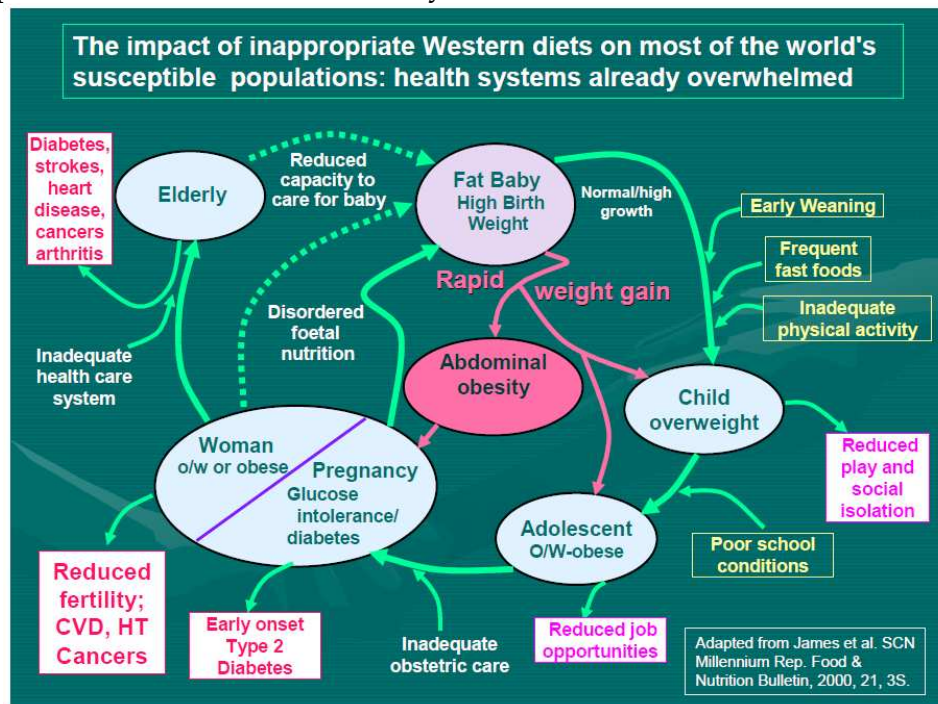
Now, the problem is that obesity is classified in the usual way as a BMI of 30+ and in terms of risks with weight gain these go up extremely early so a BMI of 30+ is an extreme value. We are all happy to be less than 25, when actually the optimum average value for the whole population is about 21 and the risk of diabetes, heart diseases, colon cancer and high blood pressure go right up well within the so-called normal weight range. Indeed, the Asian are in even bigger trouble.

Abdominal obesity in particular is a better predictor of heart disease than BMI and we are now beginning to recognize that we misunderstood this problem in most of the world; the world is in a worst state than we are in Europe. The slide shows that Asian immigrants in Europe have a 2 to 5 times increased risk of diabetes and everybody assumes this is a genetic difference. We now know it is not genetic but there are marked differences between the ethnic groups. This photograph is of two famous endocrinologists John Yudkin from London and Ranjan Yaznik from Pune in India. They have the same BMI but totally different body fats: Asian children are born with more fat and they maintain more fat at the same body weight throughout

life. We are now beginning to realize increasingly that this difference is acquired during the process of development in the uterus.

If you are talking about the value of fruit and vegetables, everybody knows that the place to go for a vegetarian society is India. In practice this is wrong because the health profile in India is a complete disaster and India is the centre of type 2 diabetes in the world. We can now look at the problem of weight gain in a new way. Most of the World, for thousand of years has been in a state where small babies are born and they develop into short children, stunted adolescents and thin short adults who are all part of a cycle of chronic malnutrition and only recently have we realized that there is a cycle of metabolic programming and organisation of the body when it develops so we are traditionally born expecting future semi starvation. If we are confronted with a different world then we have different problems. In India a mother's intake of green leafy vegetables is critical in affecting the size of babies at birth and indeed they affect the size and organisation of the body's organs: the higher the frequency of fruit and vegetables the bigger the baby. We have known for many years since a simple study 38 years ago in black South African women that they have lots of small babies below 2.5 kilos. If you give them iron you do nothing for the baby's size but if you give them folic acid or folic acid and vitamin B12 you eliminate that low birth weight to a remarkable extent. So fruit and vegetables are important and now the latest evidence shows that vitamin B12, is critical for the organisation of the body during pregnancy and affects the baby's body fat, insulin resistance and the later propensity to diabetes. India has actually a very poor intake of fresh fruit and vegetables but in addition there is pandemic vitamin B12 deficiency because they are vegetarians and this with their poor protein intake seems to explain their sensitivity to a greater body fat and propensity to diabetes now they are exposed to Western diets with more fat and sugar.

We have a different perspective now: the world is bringing up children badly and also young adults inappropriately. In association with this we have a galaxy of medical problems which are now totally unsustainable on a societal basis.



Thus in Kerala, a poor state in India just published is the finding that between 40 and 50% of adults in middle age already have diabetes. This is a complete catastrophe and it is going to get very much worse. Our confirmation, published just a few weeks ago, from analyses of hundreds of thousands of adults confirms that Asian men and women are indeed at a very high risk of diabetes.

In conclusion, we have not yet estimated the magnitude of the problem we are confronting. The global transition in diet and physical activity over the last 25 years is catastrophic. Some of the top financial advisers as well as Prime Ministers and financial ministers throughout the world are now saying that the predicted economic burden is completely unsustainable. And if you are going to do something about this we have to first recognize the magnitude of the problem, second, make appropriate plans for dietary and activity changes and thirdly, really embark on these radical solutions.

The impact of F&V on public health

Caroline VAN ROSSUM

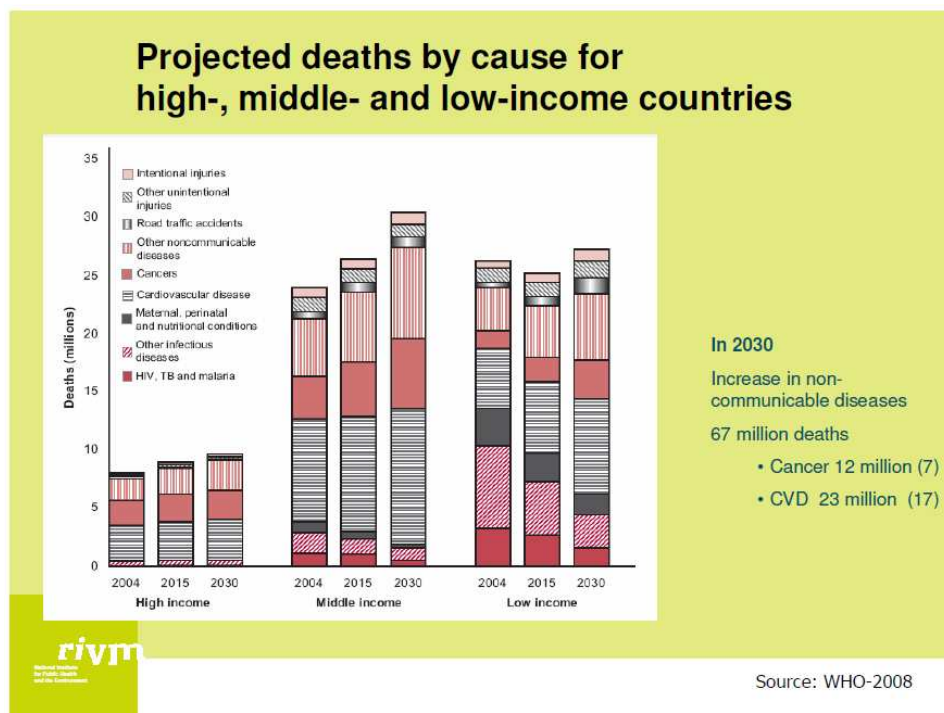
National Institute for Public Health and the Environment, Bilthoven, The Netherlands

My presentation is about the impact of fruit and vegetables on public health, not only on obesity but more in general on chronic diseases. I divided my presentation in two parts, first I want to say something about the relation about fruit and vegetables and chronic diseases. Secondly, I want to show you methods how we estimated long term effects on public health. These methods are used for nutritional policy in the Netherlands.

If you go many years ago, to the prehistoric times we know that fruit and vegetables were already an important part of the diet. But did they know the importance of fruit and vegetables for their health?

Since then many things have changed, our genes have changed, the diet has changed and even the human genome has maybe changed due to the diet. Fruit and vegetables consumption is very low; it is not anymore the main part of the diet.

At the moment, chronic diseases are the main cause of death, if you look at the projections for 2030, the communicable diseases increase more and more; more than 50% is due to these causes of death. From these diseases, cancer is the most important one with about 67 millions death and cardiovascular diseases would be responsible for 33 millions of death.



But what are the causes then of those diseases? In fact I have summarise here the diet related risk factors, factors like high salt are important, fatty acid composition of the diet are important, the blood pressure cholesterol, obesity, but also the low fruit and

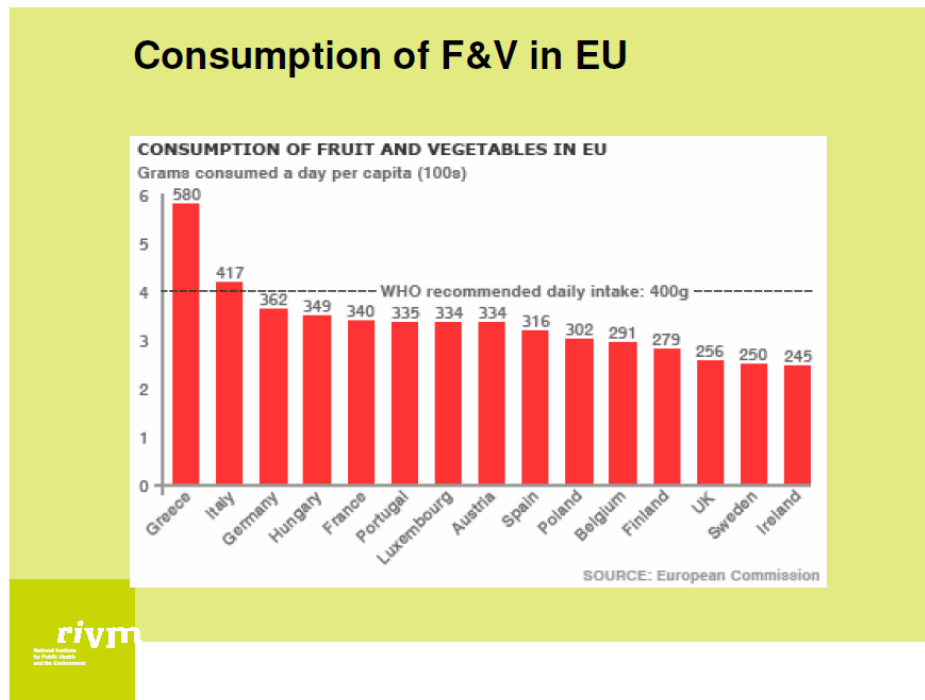
vegetables consumption. But what is the beneficial effect then of fruit and vegetables? Is it the fibre? Is it the antioxidants, the vitamins, other components of fruit and vegetables which come for the protective effect on the chronic diseases? Or is it that these products are low in energy density or low in fatty acids or low in sodium? In fact most evidence is for the total effect of fruit and vegetables, while for some components like antioxidants, the evidence are sometimes a little bit conflicting. So it is better to look at vegetable or fruit instead of certain components of it.

I want to show some examples of the associations between fruit and vegetables with chronic diseases, for example, for cardiovascular diseases and cancer and also obesity. You can see the association of fruit and vegetables consumption and risk on coronary heart diseases. In fact with the increase of the vegetable and fruit consumption, the risk on coronary heart disease decrease with 4%. The authors conclude that there is protective effect of the consumption of fruit and vegetables on coronary heart diseases.

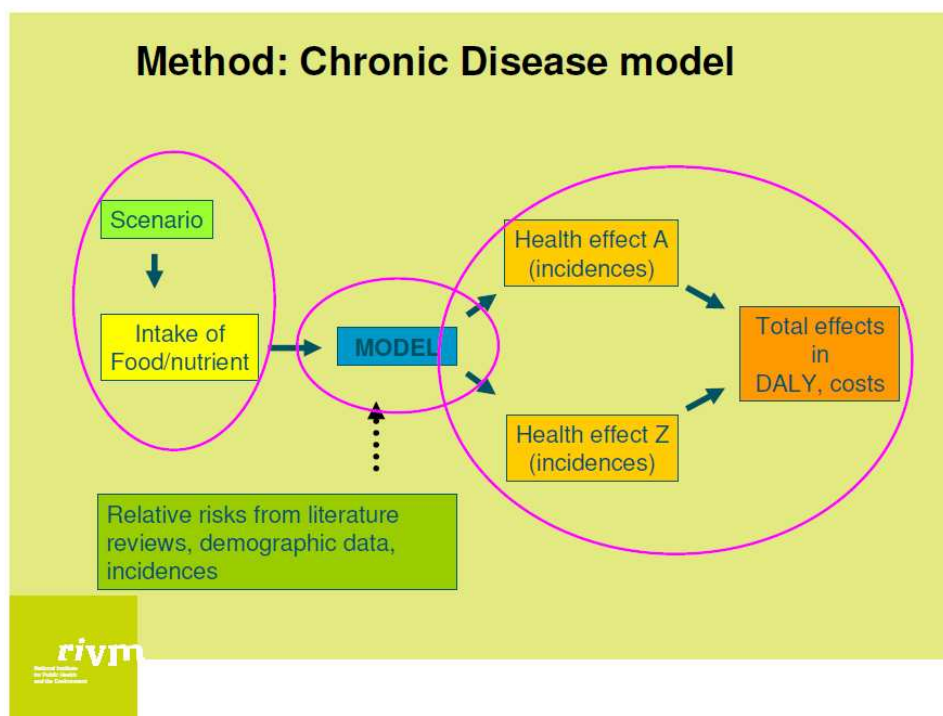
For the association between fruit and vegetables and cancer, I want to refer to the excellent work of the World Cancer Research Fund, they made an overview of the evidence for the association between fruit and vegetables and cancer, and the summed up all the literature for each association. They did a meta-analysis and if possible dose-response functions were estimated, and they came up with a summary that in fact there is not a convincing effect for the association between fruit and vegetables and the risks on cancer. But they showed that long fruit and vegetables, and non-starchy vegetables have probably an association with several kinds of cancer. In other words, due to the most recent studies the evidence for the association between fruit and vegetables and cancer has become less impressive.

Then an example for fruit and vegetables and obesity: you can see an example bases on a Spanish Study with a follow-up of 10 years. In the table the relative risks for obesity and by quartiles of intake of fruit and vegetables are shown. There was a trend observed between fruit and vegetables and weight gain.

We all know that WHO said that we have to eat more fruit and vegetables and the minimum we have to eat is about 400 grams of fruit and vegetables or 5 portions a day and most countries adapt those recommendations in their own food based intake guidelines. Sometimes it is mentioned in portion sizes, sometimes it is mentioned in grams but it is adapted by most countries now. However, the consumption, for example in Europe, is far below this recommendation although it differs per country.



The second part of my presentation is about the methods to estimating long term health effects of fruit and vegetables. In the Netherlands also the fruit and vegetables consumption is very low. From a recent study among young adults we know that almost everybody do not eat enough fruit and vegetables. Therefore the Dutch policy makers asked us: how much health loss is due to this low of fruit and vegetables? What are the economical consequences of that? And the second question they asked us is how much health gain would be achieve if everybody is following the recommendation of optimal consumption of fruit and vegetables? But in which way can these questions be answered? We are thinking: should we do a prospective study in a controlled group and an intervention group. Then, you have to wait for the incident cases, that takes very long while the policy makers want to know the answer now. So, what we did is a model simulation.



We used the so-called chronic diseases model in which we estimated long term effects of dietary interventions. How is it working?

You start with the intake distribution in the country, in our case in the Dutch population and you put that information into the model. The model is based on the evidence for the association between the intake and the chronic diseases and is based on the demographic data, on incidence data and all that kind of information. And then, like a in a black box it calculates the health effect for several diseases. Finally you can combine these different effects into measuring the Dalys or in health care costs.

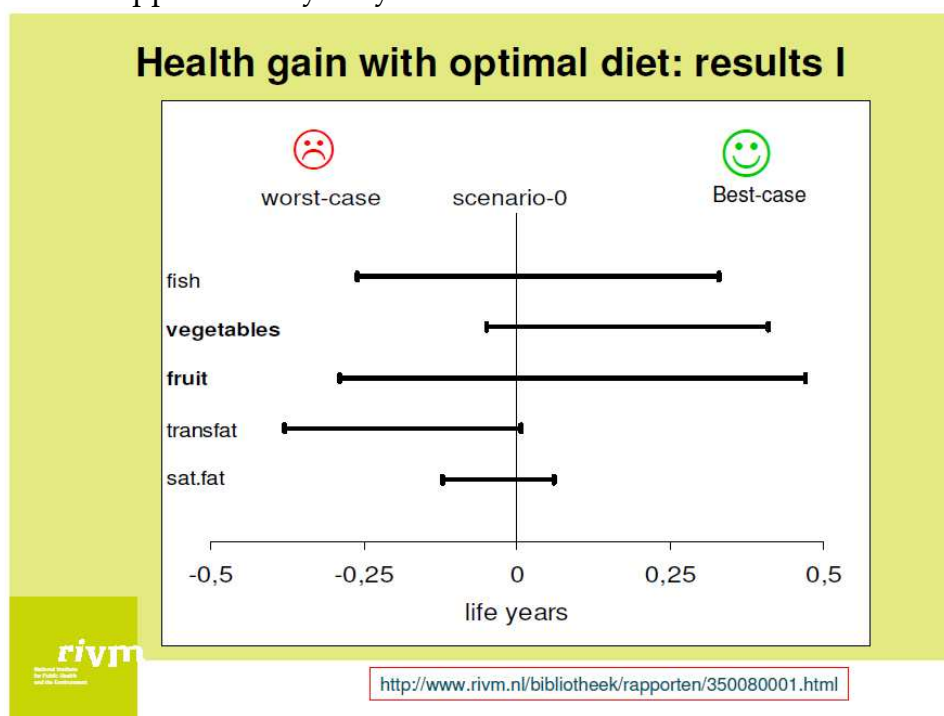
And how is the model built? The model is based on the available literature on the association between risk factors and diseases. At the moment we have 28 diseases in the model for which cancer and coronary diseases is the most important chronic diseases. At the moment we have 12 risk factors from which 6 are related to the diet, from which consumption of fruit and vegetables are the most important. The model is also based on the incidences, the demographic data in the Netherlands.

And how does it work? The model is a multistate transition model (for the experts they are now thinking AH). In fact it calculates each year the number of diseases based on the risk factors. And then you have to define what is the consumption of fruit and vegetable in the scenario you want to calculate, and you have to define a reference scenario, for example, the current situation, but also taking trends into account. And then you have to define the intervention scenario, for example for each risk factor you have to define the distribution, the frequency distribution in the country. Let's say that the current frequency distribution for vegetable consumption is in each of the 5 classes 20% of the population. Then you assume a scenario that everybody needs for recommendations, in fact the best case scenario that 100% is in the highest category with more than 200 grams of vegetables. Or you have a scenario where everybody is in the lowest category and nobody eats vegetables; the worst

cases scenario. These are just theoretical situations. And then you can compare the results of these scenarios by comparing the best case with the reference. Finally you attribute the differences in these findings to the intervention.

The model gives many kinds of results. One example is the incidences. Here you can see the reduction in incidences due to the different risk factors associated with diet. In the maximum (best-cases) scenario about 15 000 incidences would be protected due to a sufficient vegetable and fruit consumption. The nice thing is that you can compare the situation for the different risk factors like fruit, vegetables, fatty acids or fish intake or with each other. You can put all the risk factors on a balance.

Another kind of result is the life expectancy, what is the gain in life expectancy or the loss in life expectancy due to a specific intervention? You can see the life expectancy for fish or for vegetables or for fruit or for trans-fatty-acid or for saturated trans-fatty-acid; what will happen if everybody meets the recommendations?



The life expectancy will increase with about 0.4 years if everyone consumes enough vegetables, and for fruit it is even more. Based on this kind of results, we advised the policy makers to focus more on fruit and vegetables instead of the fat consumption, the health gain are already achieved.

Furthermore, also some cost effects are shown. In fact, the estimate decrease in costs of health care for the current 20 years to fruit and vegetables is 1.9 and 0.5 milliard € respectively. Maybe these amounts are about 1 to 2% of the health care costs in the Netherlands, so these are enormous amounts of money.

I presented till now two more theoretical situations but we can use those methods also for specific interventions. We did it for an example on an intervention with fruit and vegetables; the intervention is called *“SchoolGruiten”*. Fruit and vegetables are supplied at school twice a week. We had results from a pilot and we saw that the increase in fruit consumption was about 50 gram a day. Then the question was how much health gain would be achieved if the intervention would be nationally implemented? So we had to define the intake distribution for the scenario based on

the pilot research and then compare that with a reference scenario. We came up with the results that the life expectancy will increase for children with about 0.4 years. Of course, an intervention like this costs money but it saves health care costs, the net costs were 95 € per child. Per life year it costs about 256€. These kinds of estimations can help policy makers in their decision where they should put their money on? Of course those results are mainly depending on the made assumptions. For example how far are we looking in the future? If we look to the total costs in the coming 100 years, you can see that in the first decades health care costs are saved by this intervention, but later on the costs would be even higher. There are some discussion points with these methods; such as the dependence on the quality of the necessary data. We are estimating very long term effects, but what will happen in the future? Are the costs similar in the future? Or are the treatment changed? And the calculations are depending on that assumption. The main thing is that one should aware that these kinds of calculations are always a simplification that gives indications and not facts.

I want to conclude that there is sufficient evidence for associations between fruit and vegetables and chronic diseases and we have a method to estimate the long term effects of the health impact of fruit and vegetables which can be used to underpin the nutritional policy. It is now our task to translate this into daily practices.

Q&A

PUBLIC (Lorelei DISOGRA from the United States): You have wonderful results. How are you using these wonderful results with your governments for policy purposes to expand the fruit and vegetables snack program to get additional funding and how to expand it to more children?

C VAN ROSSUM: In fact we are helping policy makers, what will happen if you do this, what would happen if you do that. It is not our task to say you have to go that way or that way this is the task of policy makers themselves. But, based on our reports they are more focusing on fruit and vegetables and the next is that they are going on an organisation in the Netherlands, maybe we have too many organisations in the Netherlands but they have got a task. Fruit and vegetables, you have to do something about, the goal must be to increase. It is their task to know what to do. For example for the schools of the organisation of the farmers are involved in that. I am not sure about the day I am getting money; I am looking to someone who is here in that organisation, but it is our job to get funding. I think it takes time, it is rare and you save money if you are promoted.

PUBLIC (Mariano WINOGRAD from Argentina): The question is for Mr James. We have been in Ottawa for the IFAVA Congress; Steven KASH from Alberta University told us that one of the reasons for the nutrition transition was the policies viewed to promote cereals and fats productions all over the agricultural policies during the last 50 years. Now when cereals and fats are increasing their goals because of the

international situation do you think it would be important (...)? What will be the future when cereals and fats are becoming more expensive in relation with oil and to what is happening all over the world?

P JAMES: I think that the food crisis is going to amplify the problems of fruit and vegetables status. We have been telling prime ministers and governments for 30 years that the strategy was based on pre-war experiments which identify fat, meat, sugar and butter and milk as particularly good for stunted children and that is dominating agricultural policy throughout the world. The current food crisis is so severe that there is a meeting shortly in Roma in FAO in a week or two. Also, in Latin America, I should be going to Rio in ten days time for a meeting of Ministers of Agriculture and Health conjointly, this is a huge issue and the strategies on fruit and vegetable globally have never been worked out except the United States. They did, when I made a life difficult twenty years ago, they will show that if they followed the recommendation of 400 gram then all of the agricultural pattern of the United States would alter with a big question arising over the water supply in the Mid West.

PUBLIC: I wonder if people really understand this how many business or how many Euros it cost to get an extra quality of life. I mean, you had a number, I think it is 356.

P JAMES: Let me just say that in medical treatment it seems that you actually have relatively good medical treatment if it costs 30 000€ per quality of life. She is talking about 350. You get up to about 60 or 70 000€ and the British government starts wondering whether it is worth paying but you have got a fantastic medical treatment and it only cost 3 000€ per quality. Now what she is coming through with is a ridiculous number, it is so small. I just said something outrageous...

Elisabeth PIVONKA: No, it is not outrageous, I just wondered if you had your model published in a scientific literature anywhere?

C VAN ROSSUM: There are some publications about the chronic disease model in general. The most recent results on fruit and vegetables are published in a Dutch paper and not yet in a journal. Maybe I can go back to my presentation: this slide with the number of incident cases of diseases is published in a report 'Our food, our health'; a report in which an overview of for the dietary habits and its consequences in the Netherlands is given. The EFSA was also involved in the publication of this report.

P JAMES: And just stop at that because that comparison is really quite extraordinary, look at the example of fruit versus vegetable, I was quite intrigued by that. I guess that the fish come in terms of second death in cardiovascular diseases and the fats though, is it actually related to cardiovascular diseases as well?

C VAN ROSSUM: I think so yeah.

P JAMES: Probably?

C VAN ROSSUM: In fact, those are results from already a couple of years ago so the most recent literature is not taken into account. The input of the model should therefore be updated.

P JAMES: The big question is whether your model matches, what you see in the changes epidemiologically in the diseases pattern (...) you can do all this modelling and then you have a completely different way of checking on reality, when you says as example "in Finland there has been an incredible reduction in heart diseases and stroke" and it is actually 85 to 95% to what it was and the question is would you model fit that development? Have you done any other external checks to see how it matches up?

C VAN ROSSUM: More and more work is done on that topic.

P JAMES: Ok. I mean this is a very novel this that has been done in many different parts of the world. It is actually the way the response is coming from governments they always want to say, how much it is going to cost and so on. Thank you very much indeed for a very valuable input.

Diet quality/lifestyle and low energy density

Helmut SCHRÖDER

Institut Municipal d'Investigació Mèdica, Madrid, Spain

Reduction in dietary energy improve food intake pattern and lead to weight loss during six month in pre-appetencies in adults. Low energy density diets were associated with a lower BMI in women. In contrast, an energy dense, low fibre, high fat diet was associated with higher fatness in children aged from 5 to 9 years old. And, dietary energy density was directly associated with body mass index and fasting insulin in US adults.

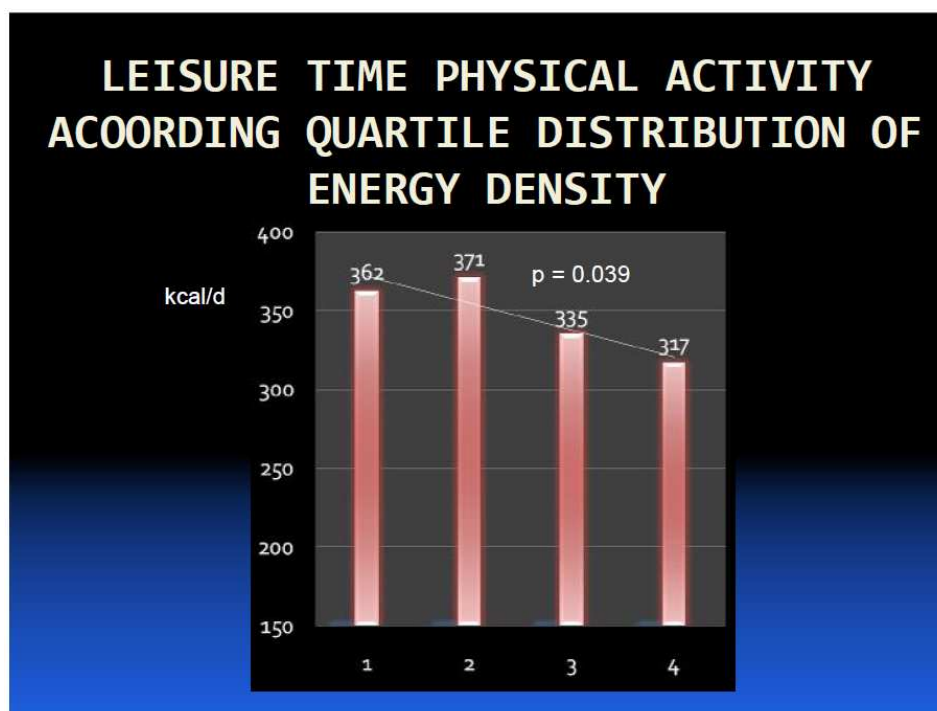
What food comprises a low energy density diet? There are many different kinds of foods that can be consumed to achieve low energy density diet and the choice of food in low energy density diet is depending on cultural food norms and personal preferences.



The average dietary energy density can be very different among populations; this fact represents different food choices and different underlined dietary patterns among populations. In this slide you can see that the average dietary energy density of the United States is remarkably higher than the one found in France and in Spain.

I will present you now, data from the *REGICOR* study which is population-based that means a representative study of men and women between 25 and 74. The *REGICOR* cohort is located in the North East of Spain. These findings are published in the *European Journal of Clinical Nutrition* and the *Journal of Nutrition*. We were interested in the association of energy density with lifestyle, variables and with socioeconomic levels in this population. We recorded smoking, alcohol consumption, and leisure time physical activity with a validated questionnaire adapted to Spanish population and educational level. What we find was that age was strongly and mostly associated with energy density, men and women following high energy density diet are younger than those following a low energy density diet, for these reasons we adjusted further analysis for age. The prevalence of smoking increase with higher energy density diets in our population, this trend was significant also, alcohol consumption increase in this population across quartile distribution of

energy density and leisure time physical activity decrease across quartiles of energy density distribution. In contrast the prevalence of secondary lifestyle defined as less 30 minutes of leisure time physical activity during a day increase with energy density.



Educational level seems to be directly associated with energy density in our population defined as university degree but it is an age problem when adjusted for age then the linear trend is not significant. Low energy density diets of the Spanish population were associated with a healthier lifestyle. They were also interested in the analyses of the association between energy density and diet quality. There are different ways to measure diet quality; you can measure diet quality through the distribution of food group, single foods and of nutrients across different decrease of energy density. Calculation of proportion of the population meeting recommended intakes for nutrients and of foods according to different decrease of dietary energy density and creation of different dietary indices in which separated different elements are combined into a single score.

As expected, energy intake increase with energy density in our population and the water intake from food decrease with energy density in our population. The proportion of the population meeting dietary recommendations according to the Spanish society of community nutrition for vegetables and fruits, you see that people following low energy density diets have higher prevalence of meeting these recommendations than people following high energy density diets and the difference is remarkable. The same was seen for carbohydrates, total fat and saturated fat, interestingly about 40% of people following low energy density diet meet recommendation for total fat but 60% meet it for saturated fat and we found the same for fibre, folate and calcium.

In conclusion, a greater proportion of the population following low energy density diets met recommended dietary intakes for essential foods and micronutrients compare to the peers with higher energy density diets. These results are in line with published papers from the United States and from several European countries.

We were also interested in the analysis of energy density diet in the elderly as the age of the world population increases. It has been estimated that by 2050 the medium age in Spain would be higher than 51 years old and 44% of Spanish will be over 60. Sustaining good health about the elderly is a major challenge to Public Health; nutrition plays a major role in protecting health and slowing the diseases progression. Ageing is accompanied by physiological changes such as the lost of appetite and taste sensitivity that can influence nutritional status therefore it is not surprising to say that old adults are generally at greater risks for nutrition deficiencies than younger adults. We analysed the association between lifestyle variables and energy density and the segment of the population can be found quite similar association as for the old population, direct association with prevalence of current smoking, direct association with alcohol consumption and direct association with leisure time physical activity but in this segment of the population a direct association of educational level with energy density. Low energy density diets of the present elderly Spanish population were associated with healthier lifestyle. And we were also interested in the association of diet quality with energy density.

We computed two indices the Mediterranean diet score and the nutrient adequacy score to calculate overall diet quality. The general characteristics of the Mediterranean diet are high consumption of fruit and vegetable, nuts, cereals and olive oil, frequent consumption of fish, low consumption of meat and sausages, low consumption of dairy products and moderate consumption of wine, in particular red wine. The concept of the Mediterranean diet was developed by Keys in the 50's to describe food habits observed in the Mediterranean area. The Mediterranean diet does not stand for homogenous and exclusive model among the Mediterranean population but rather represents a set of healthy dietary habits. How can we make this holistic approach of the Mediterranean pattern operatives for statistic analysis? We computed the Mediterranean diets according to the quartile distribution of food consumption.

MEDITERRANEAN DIET SCORE				
TERTILE DISTRIBUTION OF FOOD CONSUMPTION				
	Low	Medium	High	Score range
Cereals	1	2	3	1-3
Vegetables	1	2	3	1-3
Fruits	1	2	3	1-3
Fish	1	2	3	1-3
Nuts	1	2	3	1-3
Legumes	1	2	3	1-3
Olive oil	1	2	3	1-3
Meat	3	2	1	1-3
Dairy	3	2	1	1-3
Total score				9-27

The lowest quartile was coded as 1, medium as 2, highest as 3 for t... vegetable, fruits, fish, nuts, legume, olive oil and inversely the lowest quartile was coded for 3, medium 2 and highest for 1 for meat and dairy products. The resulting score range from 10 to 30 that mean that 30 is the highest adhering to this dietary pattern and 10 as the lowest. The nutrient adequacy score (NAS) that we found is the average daily intake of nutrients divided by age and sex specifically recommended intake of that nutrient. 19 nutrients were included in the NAS. The nutrient adequacy ratio of each nutrient included in the NAS was expressed 0.01 the final score range from 0 to 19. And in the results, we can see a direct association of dietary energy density with the nutrient adequacy score and with the Mediterranean diet score; this model was adjusted for sex, age, leisure time physical activity, educational level, and alcohol consumption, and smoking. In other words as lower is the energy density of a diet as higher is the overall quality of the diet. Low energy density diet were associated with a higher overall diet adequacy as compared with high energy density diets, specifically a greater proportion of the elderly population following low energy density diet met dietary recommended intakes for essential macronutrients compare to the peers with a high energy density diet.

Some words about the monetary costs of foods and energy density. We were also interested to see and analyse the association between monetary costs of food and energy density. It is interesting that the contribution of total food cost of vegetable and fruits are remarkably high in percentage in our population. When we analysed these data in a multivariate analysis we found that the Mediterranean diet was directly associated with monetary costs, in other words, this dietary score is more expensive. And, the energy density was inversely associated with monetary cost of the diet. Again this model stands for the entire population and for the elderly. We calculated that the subjects who highly adhered to the Mediterranean diet score have to pay 1.2€ more per day than people with a low adherence to this dietary pattern.

This cost difference is of considerable magnitude for the families' annual household budget.

Q&A

B ROLLS: It is quite difficult to assess energy density; there are no universal rules about what to do with beverages for example. I am not sure what you did with beverages and I suspect when you were comparing the energy density across the different countries that data had different inclusion or exclusion of beverages. The point is if you include beverages in your calculation they have a very disproportion on energy density because they have such high water content. So one of the thing we need to do if we thing energy density as important is we need to really get uniform assessments of energy density and into our national data set.

H SCHRÖDER: The data presented were data on energy density related by food only and the slide I presented was also the average energy density by food only. We did this analysis including energy contained in beverages and we did not find any significant differences between both analyses. Maybe because in our population the consumption of energy containing beverages like soft drinks, and fruit juices is not as high as the United States.

PUBLIC (Anne GAULTIER from the French Ministry of Agriculture): Je voudrais savoir si vous avez eu des contacts avec le gouvernement espagnol et si votre travail a été utilisé pour la mise en place de politiques nutritionnelles ou de recommandations parce qu'il est vrai que le concept de densité énergétique n'est pas aussi médiatisé que les 5 fruits et légumes par jour en France par exemple.

H SCHRÖDER: We have no support by the government and this analysis or the study of this cohort was not created with the primary objective to give recommendations to the Spanish government.

PUBLIC (Adam DREWNOWSKI): If you look at the food pattern, here you got a beautiful analysis of the energy density but I remember 20, 30 years ago seeing the most incredible graphs of food intakes changing in Spain with an amazing North South gradients. When the South ate loads of fruits and vegetables and they had a much higher fat intake as you went further North with much more meats and fats pattern it was getting horribly like the British diet, I suddenly realise you are doing studies in the North East. Does this gradient still apply? Or has the North of Spain now become like Northern Europe?

H SCHRÖDER: I am not sure because there is no evidence. I assume that those differences seen a lot of time ago are not so big nowadays because during these times, the differences in food consumption represent also a difference in income between South and North. Fruit and vegetables during this time were not expensive but high energy density foods like meat were expensive.

B ROLLS: It is interesting your comment that eating a low energy density diet is more expensive and I am sure Adam DREWNOWSKI is going to have some comment to make about that. If you're factoring nutrient density along with energy density then the economic picture shift a bit because fruit and vegetables, low energy density diets in term of nutrients are good bargains, if you looking at energy not such a good bargain.

H SCHRÖDER: Yes it is true.

PUBLIC (Adam DREWNOWSKI): Can I come back then on Spain? You are presumably talking about people always buying their fruits and vegetables. I mean how much is home grown? Again, in the old days, there were a lot of people that had their own garden, and particularly in Spain I understand there was a lot of local, certainly it is true of Portugal and I think of Spain, it seemed that fruit and vegetables almost cost nothing. It is part of the problem now that people are always relying on the shops or is that irrelevant?

H SCHRÖDER: Yes I think it is part of the reasons because we still have this local distribution of food once a week where you can get fruit relatively cheap in comparison to supermarkets. But, it is difficult for a great part of the population to access these local markets because they are working.

PUBLIC (Mariano WINOGRAD from Argentina): About this difference of 2000 and something Euros per year per family between the low density and the high density, I think it is photography of the actual situation. But really during the last 5, 6 years after the bio energy crops and now the high inflation, maybe this situation will not be in the future because sugar and fats are increasing their costs and I think it is something interesting maybe to take this study again and to continue because these differences may be a picture of the past but maybe not probably the film of the future.

P JAMES: He is bringing up a difficult question because he lives in the bio fuel world and this is one of the most intensely controversial aspects and the proposition is that if the costs of cereals, sugars and so on goes up people will have to buy more fruit and vegetables, is that true?

H SCHRÖDER: I really do not know (...) but I can make a comment. The increase of costs of fruit and vegetables and the increase of many of the basic stuff in the Spanish society coincidences with the change of Pesetas to Euro.

PUBLIC (Ellen MUEHLHOFF from FAO): I just liked to respond to the issue posed by Philip JAMES in regard to changing consumption patterns at the global level. Within the context of soaring food prices we have some evidence to indicate that people are actually reducing the dietary quality as a result of rising cereals prices and

rise of fat and sugar and that mean that people are purchasing less fruit and vegetables, that seems to be the anecdote of evidence that we have. And I was wondering also to what extent that actually applies within the European context because we are experiencing a similar rise in food prices? And what are some of the implications? And are indeed people going back to growing their own food, own gardening etc? In, Italy for example we see that quite a lot people are keeping their own little garden primarily in the rural areas to grow fruit and vegetables.

P JAMES: She is talking about price elasticity. It is quite surprising that the human brain always wants calories and does not distinguish folic acids and all these other funny nutrients. So, in fact if the price of food goes up you still have to go for the cheapest option and therefore your fruit and vegetables are still relatively expensive. The question is you do not know whether they are going for gardening, home gardens, in Geneva last week at the World Health Assembly even the British government now noted that the popularity of gardening had suddenly gone up and it was probably associated with the increase in costs and traditionally it is quite often the lower socioeconomic groups that have their local gardens and therefore this is maybe a response in exactly the same way you are suggesting.

Strategies to enhance satiety with fruits and vegetables: implications for weight management

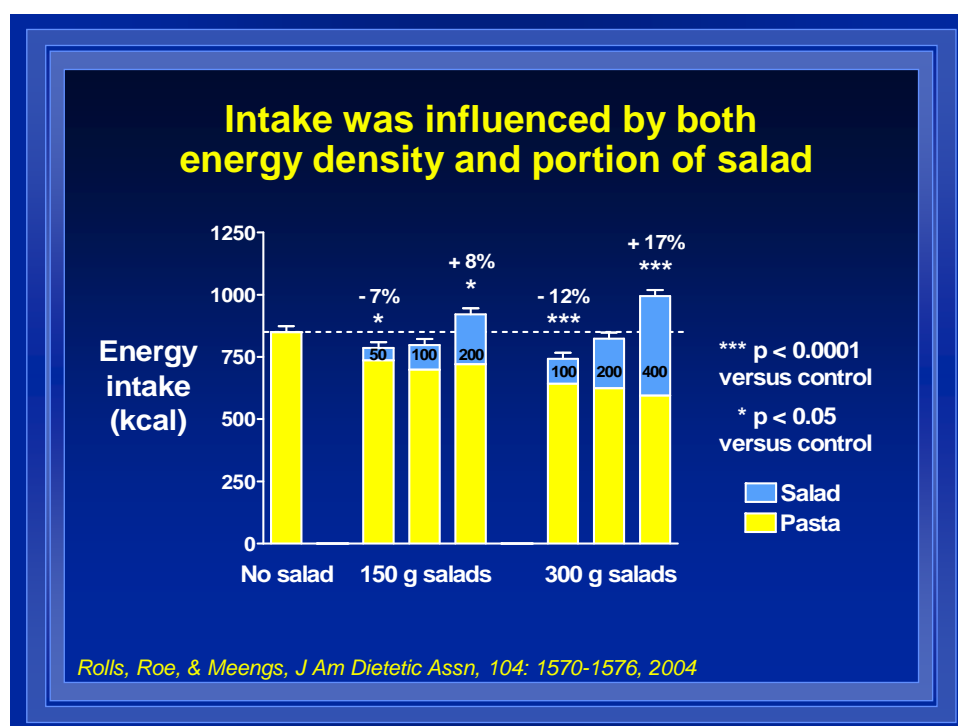
Barbara ROLLS

Department of Nutritional Sciences, The Pennsylvania State University, USA

Much of our research is based on the idea that eating more fruit and vegetables is the most effective way to lower the energy density of the diet. Incorporating them into the diet helps to ensure that the diet is low in energy density since most fruit and vegetables are naturally low in fat, high in fibre, and importantly very high in water content. The water content of most fruit and vegetables is 80 to 95% so adding fruit and vegetables to the diet gives you a lot more food for a given calorie level (Rolls et al, 2004; Ledikwe et al, 2007a).

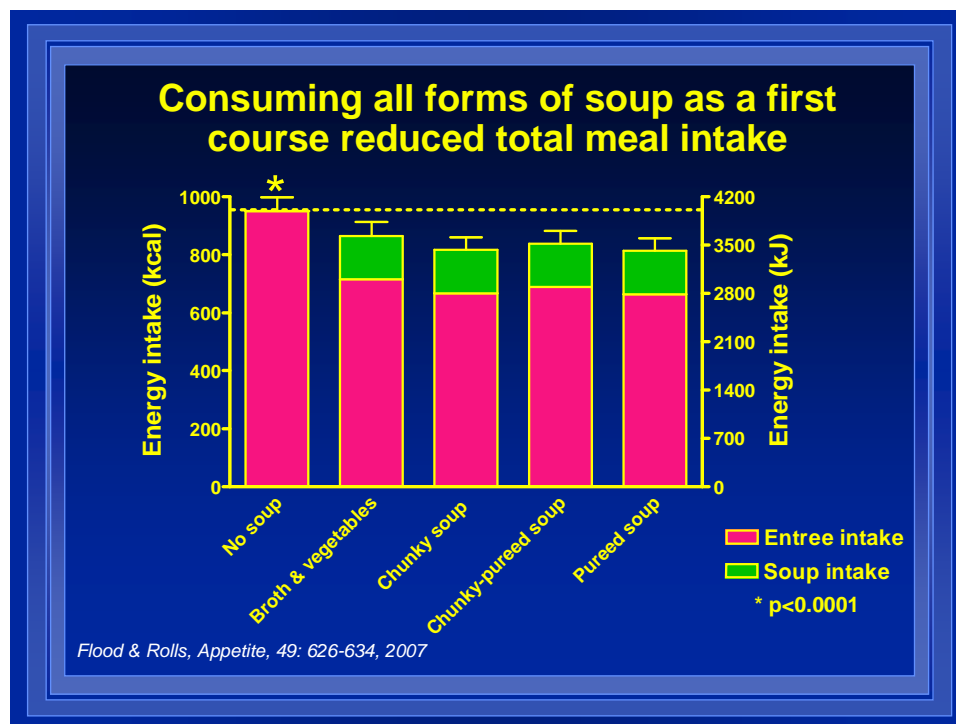
The research that we have been doing with fruit and vegetables is aimed at finding practical strategies to affect energy intake and ultimately body weight. In some of our studies we are looking at whether giving people a first course of fruit or vegetables affects total energy intake in a meal. In this first study, we gave two different portions of salads, some small salads and some bigger salads, and we varied the energy content and the overall energy density. The lower energy density salads had more vegetables and a low fat dressing and less cheese. People had to eat the salads at the start of their meal and then a few minutes after they finished eating the salad they were given a big bowl of pasta to eat. People were tested in every condition as well as in the condition where they had no first course at all; this was our baseline condition. If you have a low calorie salad, particularly a low calorie big salad at the start of the meal it fills you up and you finally end up consuming fewer calories at the meal. Advising people to eat a large, low-calorie salad at the beginning of the meal gives them an extra course, gives them more food, and helps them to eat less energy (Rolls et al, 2004).

We
done a



have

number of studies on soup and satiety. Eating soup is a good way to fill up because it is very low in energy density. There is some data that indicated that chunky vegetable soups were more effective in filling people up than smooth soups. To further investigate this suggestion we tested the effects of vegetable soup in four different forms. We served cooked vegetables and broth separately, we mixed the broth and vegetables together to make a chunky soup, or we blended half the mixture or all of the mixture to make smooth soups. The form of the soup did not affect the response. When eating vegetable soup in any form, people ended up eating 20% fewer calories at the meal; yet they were getting an extra course, more food, and more vegetables (Flood and Rolls, 2007).

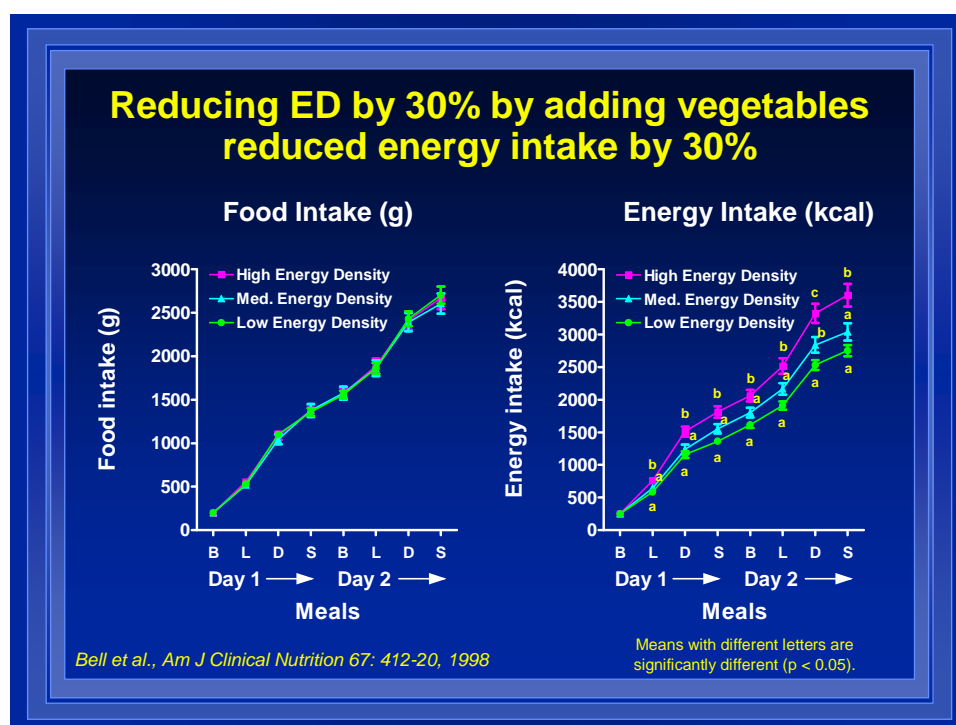


What about fruit? There is data suggesting that fruit in its whole form is more satiating than liquid fruit juice, but these studies have not controlled for differences in energy density and fibre content of the different forms. In this study, we served slices of peeled apple at the start of the meal, apple sauce, or two forms of juice (one with fibre to match the fibre content of the fruit or one which is a typical commercial apple juice with little or no fibre). You can see that having the apple at the start of the meal very effectively reduced total energy intake at the meal by 15%, almost 200 calories. Apple sauce also reduced intake, but not as effectively as the whole fruit. The whole fruit and applesauce reduced meal calorie intake more than the juices. Surprisingly, adding fibre to the juice did not affect satiety.

You can use this strategy of having a low energy density first course of vegetables (salads or soups) or of whole fruits to help people to eat less and also to increase their consumption of fruit and vegetables. It is a strategy we need to convey to the public more often. We are now doing some studies looking at the strategy in preschool children; such tests have never been done.

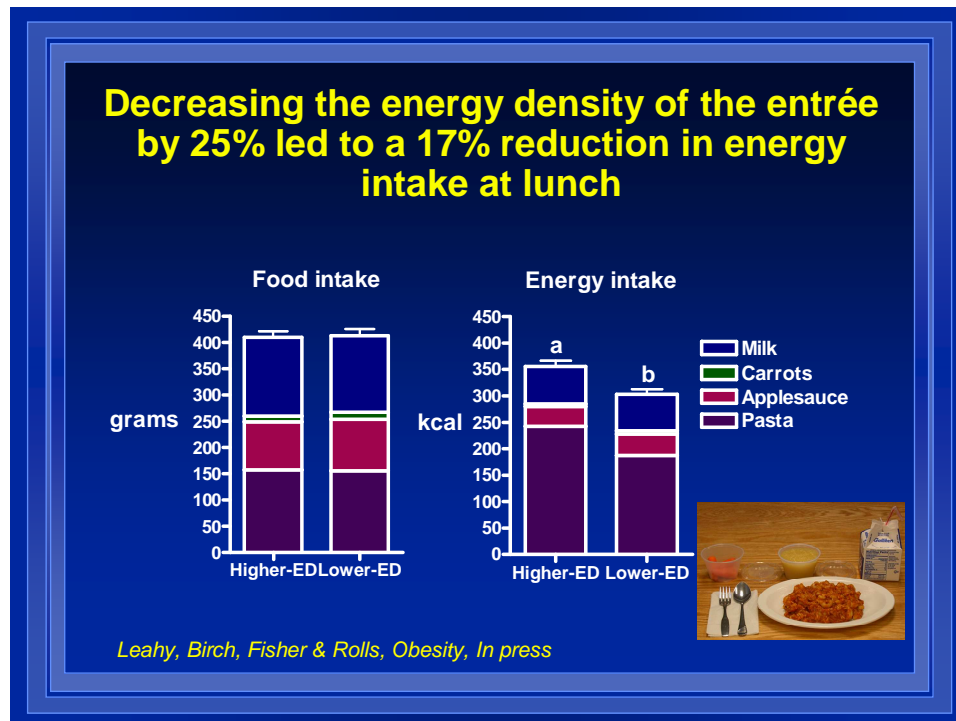
Another strategy that is promoted to increase vegetable intake is to simply increase the amount served on the plate. This strategy has not been tested previously, and we do not know if adding more vegetables to the plate affects vegetable consumption. In a recent study, we changed the proportion of vegetables on the plate from 25% up to 50%. We substituted the vegetables for the other meal components (meat and rice) and we had two different energy densities of broccoli. We found that increasing the proportion of vegetables increased vegetable intake. When the vegetables were low in energy density, energy intake during the meal was decreased. Serving an increased proportion of low energy density vegetables on the plate helps people to increase vegetable consumption and reduce energy intake in the meal.

We have shown in several studies that adding extra vegetables to mixed dishes such as pasta or rice lowers the energy density, increases intake of vegetables, and lowers energy intake during a meal. What people do when offered a dish that has more vegetables is they tend to eat a consistent weight of food. Thus, when the extra vegetables lower the energy density of the dish, energy intake is reduced. If you are given the food and you do not know what the energy content is, you will tend to eat an amount of food that you have learned is appropriate. If the energy density was lowered by adding vegetables, you will eat fewer calories. Here when we lowered the energy density by 30%, the people ate 30% fewer calories over these meals for two days with no signs that they were getting hungrier (Bell et al, 1998).



We recently started to do similar studies in preschool children; we have been studying children 3 to 5 years of age. We go into their preschool and we alter their typical meals. In this study, we lowered the energy density of a pasta dish by adding extra blended cooked broccoli and cauliflower to the tomato sauce. What we found was that the children tended to eat a consistent weight of food—similar to our

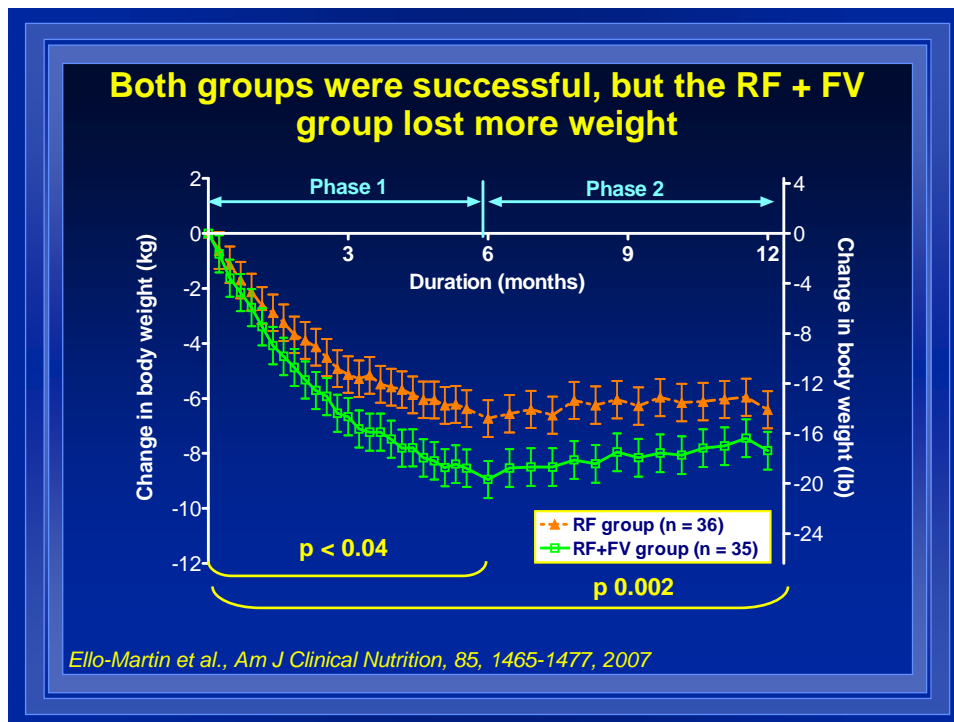
findings in adults. Since we had lowered the energy density of this pasta dish by 25%, we observed a 25% reduction in energy intake from the pasta. An exciting finding was that when we added the vegetables to the pasta, the children ate significantly more vegetables—and they liked the dish as well as the dish with fewer vegetables (Leahy et al, 2008).



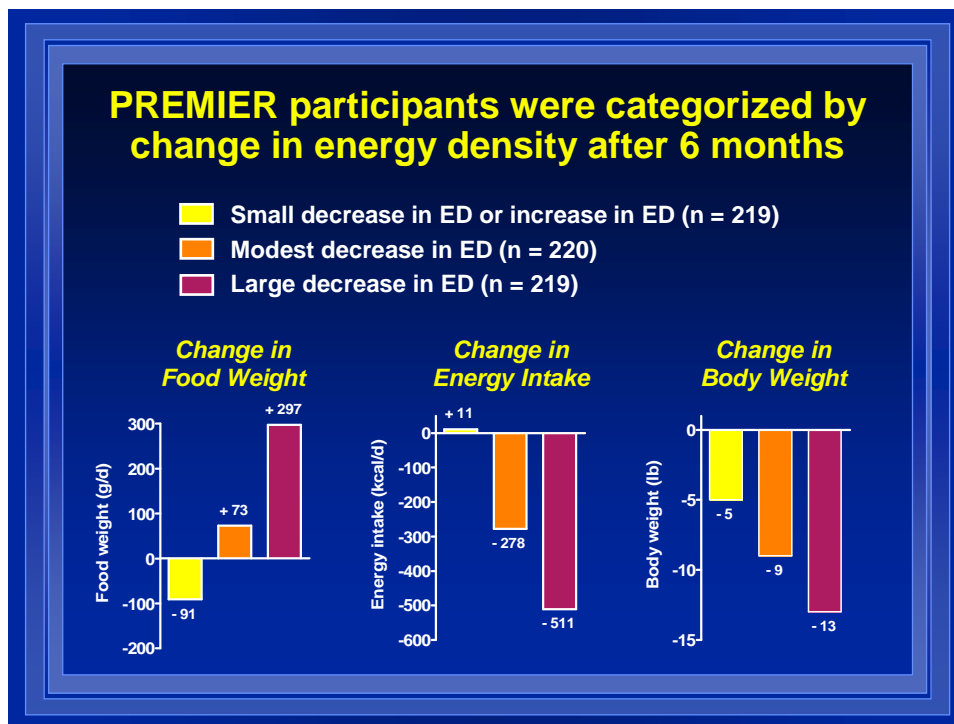
Thus, lowering the energy density by increasing the proportion of vegetables in mixed dishes or on the plate increases vegetable intake and helps to decrease energy intake at a meal.

What about using these strategies for weight management? Would the effect of lowering the energy density persist over a longer term? You can reduce the energy density of the diet by decreasing the fat content which has been the standard way to approach weight management for years. Thus, we compared a reduced-fat weight management diet with one where we gave people the same advice for fat reduction but also urged them to eat lower energy density fruit, vegetables, and broth-based soups. This was positive messaging where we were emphasising what people can eat rather than what they should not eat. We did not give them calorie goals, or fat gram goals. This was a year long clinical trial with 97 women over a year. We found that both groups significantly reduced the energy density of their diets, but eating more fruit and vegetables caused a greater decrease. Both groups lost a significant amount of weight. The reduced-fat group lost about 15 pounds over the first 6 months. During this same period the group that was urged to eat more fruit and vegetables lost significantly more weight. They lost about 20 pounds and this difference between the groups persisted through the next six months. This was an intensive program where participants met regularly with dietitians. We need to develop programs that are less intensive and that people can do more on their own or through physician's offices. This study showed that the people who lost more weight

reported eating more fruit and vegetables and eating a greater weight of food, and they reported less hunger over the year of the trial (Ello-Martin et al, 2007).



While data examining the relationship between dietary energy density and body weight are still limited, analysis of data from the multi-center trial PREMIER indicates that over the first 6 months the change in body weight was related to the change in dietary energy density. This trial included over 600 participants divided into 3 treatment groups that received different amounts and types of dietary advice. Because changes in energy density were reported by participants in each treatment group, analyses were conducted by stratifying them by change in energy density (ED) tertile over the 6 months of treatment. Participants in the highest tertile (ie, largest ED reduction) lost more weight (5.9 kg) than those in the middle (4.0 kg) or lowest (2.4 kg) tertile. Participants in the highest and middle tertiles increased the weight of food consumed (300 and 80 g/day respectively) but decreased their energy intake (500 and 250 kcal/day). The highest and middle tertiles had favorable changes in fruit, vegetable, vitamin, and mineral intakes.



These data suggest that lowering the energy density of the diet facilitates weight loss and improves diet quality (Ledikwe et al, 2007b).

In conclusion, we find that in both short term studies and longer terms studies that eating more fruit and vegetables can reduce the energy density of a variety of dietary patterns. A benefit of using energy density reduction is that there are many different patterns that people can adopt to fit with their own preferences and that will improve diet quality and facilitate weight loss (Ledikwe et al, 2006 a and b). We have shown that some relatively simple strategies can help people to eat more fruits and vegetables, while decreasing their energy intake. These strategies can give people additional reasons to consume more fruit and vegetables at the start of the meal, add them to recipes, and increase the proportion on the plate.

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Q&A

P JAMES: Lots of the questions to the earlier speakers were specifically asking how your work influenced government policy. You come from the most sophisticated country in the world, how have your studies affected the government?

B ROLLS: Actually it is interesting to see what happens in terms of recommendations about dietary energy density and fruits and vegetables in relation to weight management with the next US Dietary Guidelines. They are putting the Committee together now; in the US the Guidelines are redone every five years. For the last Dietary Guidelines it was not thought that there was enough evidence for a strong recommendation that either reducing energy density or increasing fruit and vegetable intake would help body weight management. Clearly, we need to keep doing studies that clarify the role that fruit and vegetables play in weight management.

PUBLIC (John MILNER): I know this is all about energy density but do you find any differences depending on the fruits or the vegetables that you introduce? Are they some variations or not?

B ROLLS: That is a good question, but we do not know the answer now. We need more research on how different types of fruits and vegetables as well as the preparation method affect energy intake.

PUBLIC (John MILNER): So the principle of change that you are introducing, I think of peas and broccoli and a few things like that is that correct?

B ROLLS: When we are incorporating vegetables into mixed dishes we are usually going for ones that are low in energy density so it would be broccoli, cauliflower...

PUBLIC (John MILNER): So you have no indication about cruciferous vegetables compared to other types? I think that there are some unique compounds that are in some of these foods that could modify ingestive behaviour. There are changes in the epigenetic processes that may be shown to be signals for eating behaviour down the road.

B ROLLS: Following up on that, I think we need a lot more people working in this area because there are so many good questions that have not been asked and essentially nothing mechanistic. We usually do not assess biological markers in these kinds of studies at this early stage of knowledge. None of those studies has been done in young children, for example, apart from the few I have shown you.

PUBLIC (John MILNER): Do you have any information about changes that occur in inflammatory processes in individuals? Certainly this is one of the mechanisms that I would think about with fruit and vegetables that might be modifying our health?

B ROLLS: We are hoping to get some data like that.

PUBLIC (from Liverpool): I wanted to ask you a question about policy questions again. The evidence you are giving about fruit and vegetables reducing energy density is brilliant but what about the cost implications, particularly for people with low income because we heard from the previous speakers that fruit and vegetables can be more expensive? And also is the population in America equipped to make these changes? Do they have the cooking skills to prepare their fruit and vegetables and cook meals from scratch because if they are eating processed food then these sorts of recommendations might not make any sense to them?

B ROLLS: She is asking about how we make people do this in terms of costs and about the fact that people do not cook anymore. I think there are a lot of ways to do this relatively inexpensively, soups are very inexpensive for example, and canned and frozen vegetables can be inexpensive. We need to leverage approaches so they are not just for the privileged who can afford to do them. In terms of cooking I think we need to have more foods available that make it much easier for us to eat more fruit and vegetables. For example, we need to have more mixed dishes with a greater proportion of fruits and vegetables. Unless it is made easier many of us will not make the effort to do it.

PUBLIC (Christina POLLARD from Australia): The message seems relatively simple, eating a salad before you start a meal, having a soup with a meal. How did the participants take to their dietary patterns? Was it a big change for people?

B ROLLS: It would depend. Obviously when we do studies we would ask participants if they typically consume the food we are going to feed. We would not want people that are going to find that what we are doing is completely novel. But I think the most interesting question is whether people will persist with such recommendations. Such data need to be collected.

PUBLIC (Philippe COMOLET-TIRMAN from Interfel-Aprifel): Barbara Rolls a montré que l'une des façons d'augmenter la consommation des fruits et légumes frais c'est d'augmenter la proportion des fruits et légumes dans l'assiette. Je voulais simplement souligner que nous, en France, dans le cadre des campagnes de communication de la Filière Fruits et Légumes pour augmenter la consommation des fruits et légumes, nous nous appuyons depuis 2 ans sur cette approche, à la fois psychologique et physiologique, à savoir que notre message de communication c'est « la moitié de ce que vous mangez, la moitié de l'assiette plus précisément c'est des fruits et des légumes frais, donc c'est un message de communication qu'on estime être beaucoup plus facile à comprendre pour le consommateur et qui rejoint les résultats que vous nous avez montré.

B ROLLS: That is really interesting but in the study I showed you we substituted vegetables for the other meal components and in American policy that is what the CDC and others will say: "When you are eating more vegetables substitute them for other components". We are doing a study now where we are adding more vegetables to the plate keeping the other components the same to see if vegetables can compete against that.

PUBLIC (Vanessa CANDEIAS from the World Health Organisation in Geneva): Thank you for your very clear and very informative presentation. I have one question. If these studies had to be duplicated in a low and middle income setting, what considerations would you think about in terms of food insecurity? Have you ever thought about how this could be addressed? In terms of policy, to have a bowl of salad before your meal, how would you translate that if food security would be a preoccupation in that setting?

P JAMES: The reason why she is asking that is that for example in India the average fruit and vegetables intake is 130 grams and in the rural parts of India, 70 to 80% of women eat no fruits at all from the beginning to the end of the month.

B ROLLS: I understand that there are economic issues; I am a basic scientist doing proof of principle research. At this point we have very little idea of whether eating more fruit and vegetables would affect overall energy consumption and body weight. That is our starting point. I am not an economist. I do not know how you do this, but obviously it has to be culturally sensitive and we have to figure out how to make it affordable, but that is not what I do. That is what policy makers have to figure out once we give them the science to show that it could have some potential to increase consumption of fruit and vegetables and to help moderate energy intake.

SESSION 10

F&V SCHOOL SCHEME

Chair: **D. Barling**

- The European School Fruit Scheme: public policy and supply challenges. **D. Barling**
- Towards an European School Fruit Scheme. **L. Hoelgaard**
- Evaluation of diet and health trends considerations on study design. **E. Riboli**

The European School Fruit Scheme: public policy and supply challenges

David BARLING

Centre for food policy, city university London, UK

This talk is aim to give some context to the European School Fruit Scheme and what I want to do is consider 4 dimensions which seems to not be closely linked but in my analysis are all very important dimensions which need to be considering. First is that we, the scheme, we have the opportunity of linking production to consumption in agriculture and food terms for public health benefits. A key element of this is going to be the public procurement as a policy instrument and some experiences that we have at a ground level particularly drawing on projects in the UK that are important to these and that come quite significant in the supply chain particularly at the school level. Thirdly I just want to introduce as well and reflect on the environmental dimensions of any projects of this kind. And in a broader vision linking public health with environment has important dimensions of any food policy. And finally I would suggest wider policy dimensions at the European level particularly over the future direction of the CAP.

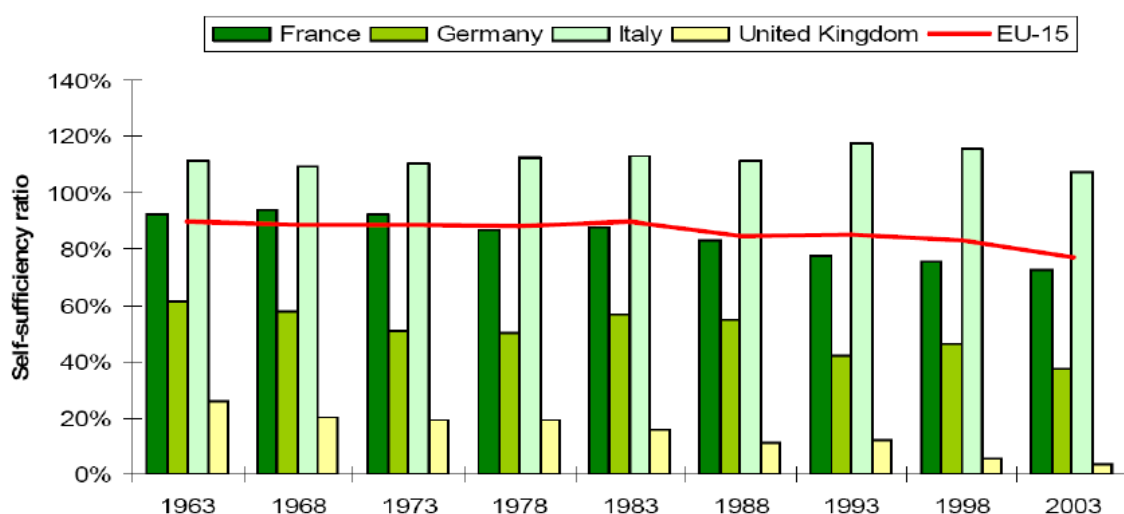
In terms of the opportunity of linking production to consumption for public health benefits what is the vision for food policy in terms of linking production to consumption? I just want to lay out some very broad points and that is ambitious notions here but clearly the concern in this conference is to achieve public health goals that the food system from production to consumption should be guided with public health goals. Equally important are environmental goals as well and these already have some priority clearly in European Agriculture Policy with the recent reforms. But I am not sure there is enough just to address each of these goals as separate policy areas rather we might ask can we integrate both of these two policy strands together. So our primarily concern in this conference is public health as well as trying to think through some of the environmental dimensions as well. There are other questions I want to ask. How to recast production to meet public health and environmental goals? Because production, the way we produce our food and the way production is being supported by the states through policy has certain directions and that support has not been so clear in the public health oriented foods such as F&V. Also seek shift in consumption patterns and behaviours, moving people towards sustainable consumption that is a rising policy issue notably in the UK with particular concern in the environment to address sustainable consumption and how consumer behaviours patterns can be address in policy and what sort of initiatives are needed. This is clearly a concern for public health but in environment equally it can be a concern. About recasting production to meet public health and environmental goals one example of this which is put by agricultural economists is to take the diet guidelines from the WHO/FAO/Technical Report from 2003 and if you look at the global production change needed they admitted that areas where we

produce very highly in order to meet the dietary goals would have to come down. So globally we will have to reduce:

- ↓ Pig meat DOWN by 5%
- ↓ Butter DOWN by 13%
- ↓ Cream DOWN by 18%
- ↓ Animal fat DOWN by 31%
- ↓ Soybean oil DOWN by 14%
- ↓ Rapeseed oil DOWN by 30-35% (From Irz et al (2003))

The same group of economist ended a further study where they looked at OECD countries and using the basic dietary guidelines desired intake of 400g/day they said what will be needed in terms of change in production, what you will need would be a per capita consumption rise in OECD countries of 23% and this will lead to a rise of 79 million tons of F&V and this based on the 400g a day. That does not take into account the wastage in the system to get to that 400g a day consumption and Tim Lobstein who have made an evaluation of F&V that we would need to reach those levels of consumption which is far higher than this estimate because it takes into

National fruit production self-sufficiency



account the wastage and what is lost along the supply chain.

If you look at these figures across Europe if we go back to the 15 member states we can see that self-sufficiency of food production varies over countries so if we are addressing an European approach to this some countries would need to increase their production to meet the dietary goals quite substantially although in the common market it is not such a concern. But we can see from the columns here that some of the countries are far closer or exceed their own national self-sufficiency needs whereas countries like the UK are far way from such target.

What we have now offered to us with the School Fruit Scheme is a policy window to make these kinds of links between what we produce and what we consume. The

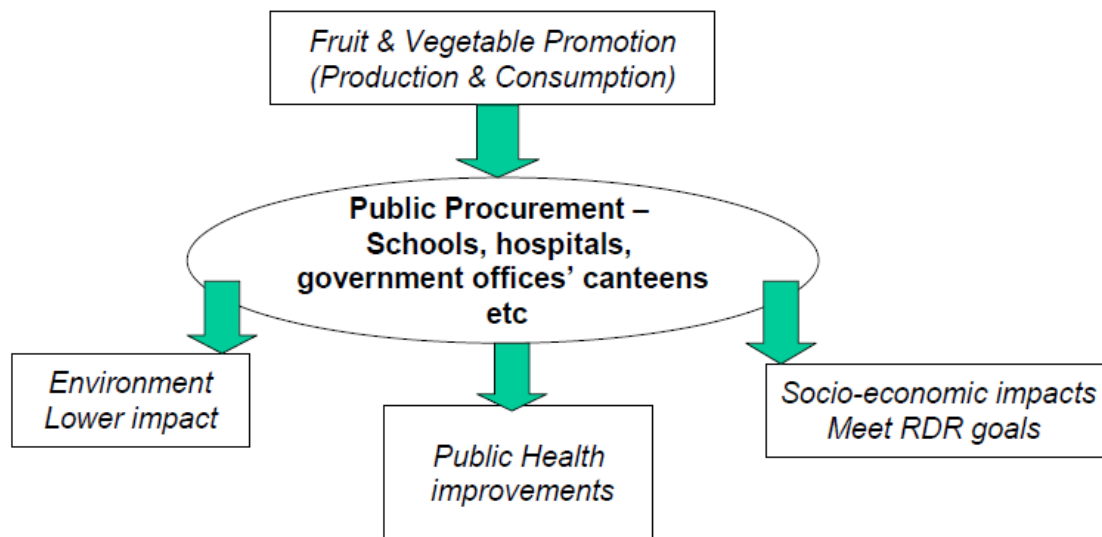
Common Market Organisation has seen a shift from controlling the supply in terms of price controls to shift to create market opportunities or demand for producers (notably through Producer Organisations) and products and the link is now being made with health promotion. The link of the reform for the F&V regime alongside the growing concern at European policy level for the effects of obesity means that we have a policy window clearly opened here last year. This was an issue seen last year in Brussels and we are now seeing moving speedily toward actualisation policy reality. The options that the E. Commission's Inter Service Group put on the table are:

- driving initiatives from the EU level to the national - Commission would co-finance the purchase of F & V for distribution in schools;
- commission co-finance member state designed initiatives (stipulate criteria);
- networking alliance – low key.

The school program means that we will be using public procurement as a policy instrument and the supply chain challenges to achieve the goal of that program. Here it is worth looking policy procurement what we know about this in terms of providing food through public procurement. Broadly it is quite clear this is a rising potential instrument in European policy. Looking at the EU Sustainable Development Strategy for 2006 among the 6 or 7 priority areas are Sustainable Consumption and Production (SCP), Public Health and if you look at that section obesity is the main food related issue there and also conservation and management of natural resources e.g. biodiversity as the environment is a key concern. Within sustainable consumption and production not a lot is put into that document, a key role is ascribed to "green public procurement" which is a vague term but its initial response will be regulated environmentally co-ordinated public procurement, public procurement with a low environmental impact.

In terms of F&V promotion public procurement becomes a policy tool so we are looking to promote consumption but also to support production as well. And we need to link the producers to the areas of consumption and that is the schools, hospitals, government offices' canteens, care homes, etc. The aims of this are to improve public health, to lower environmental impact and also to meet socio-economic goals, RDR goals for F&V producers or producer's organisations.

Public Procurement as a policy tool



Looking to the UK Public Procurement Policy I just want to talk about the context in the UK and then also to give some great brand level examples which I have been involved in. In terms of UK Public Procurement Policy the spend is estimated at £2 billion a year, 50% of this spend is in schools and, per weekday across the public sectors it is estimated that around 3.5 million meals. But within our own procurement policy there is a policy tension between one hand the government desire to use public procurement as a method of getting best value (economic value is the key indicator here) to bring down government costs, to control the departmental budgets, to make them more effective and efficient but at the same time we also have clear initiatives for using procurement as a tool for sustainability goals and sustainable food is one of those elements. So there is a tension between best value and sustainability goals currently within our own policy. I am not sure it is in many European countries. Within our government our Department for the Environment Food and Rural Affairs (Defra) are an advocate and they advocated sustainable procurement for food, sustainable strategy for farming and foods which maps a more integrated strategy for our farming industries but also for a food industry as a whole linking it up to consumption. A major step in this was a setting the Public Sector Food Procurement Initiative (PSFPI) in 2003 and in broader terms the government has produced a Sustainable Procurement Action Plan in 2007. So there is a strong driver of governments towards using public procurement as way of delivering sustainable food from the producer to the consumer.

More specifically around UK School meals, this has become an area of policy contention and has led to response and this is taken 3 major documents which reflect some of the *devolved* nation as also the *devolved* nature of the UK at the moment in terms of governmental administration there have also been a more general policy put forward for Northern Ireland. Scotland were the initiators in addressing school meals with their document 'Hungry for success' (2002) and this has been followed in Wales by 'Appetite for life' and in England in 2005 the School Meals Review Panel Report

produced the report 'Turning the tables' and from that they set up a School Food Trust to take forward the recommendations of that report and one the key areas that has been developed, our nutrition standards for schools introduced in 2006 out of highly contested process from different participants as to what the standards should be and this have been ruled at first at primary schools which is children up to the age of 11 and then the secondary, 12 to 18 year olds due to be ruled out next year. What is missing from these current settings of school food initiatives is the link to the more sustainable procurement initiative in terms of environmental criteria, these are absent.

If we look at a ground level it is generally agreed by those who follow and are involved in public procurement where food is concern in the UK is that the situation is one of "Islands of good practice" which means of course the other side that is usually in the sea, mediocrity. But the "Islands of good practice" are there and I have some insight from this sharing project on behalf of sustain which is our Food & Farming NGO alliance in the UK who runs two projects. One is better hospital food project that has been followed up by the good food public plate project. Both of these have had some funding from both government and *childhood* trusts and the projects, particularly the one God Food on a Public Plate have been about good practice dissemination trying to really act as a sort of dating agency between producers who want supply and public institutions who want to improve their menus and increase their local food supply particularly fresh and seasonal food and this involves hospitals, schools and care homes for the elderly. What we see is that it is a very fragmented procurement process the reality is that procurement is highly fragmented by and within and across its different institutions. Even within education it is highly fragmented. The real theme is trying to find creative ways of helping procurement to be involved in create procurement in order to obtain and utilise more effectively sustainable food. What I mean by this, some examples such as at the school level having training for schools chefs which includes how to draw up seasonal menus which are in accordance and harmonised with more local food supply also in terms of cooking meals that meet nutritional standards and how to use the facilities that they have at the schools because clearly one of the problems is the structure. Many schools have moved their kitchens over the last couple of decades and so there is a need to find to overcome that or to reintroduce the structural factors simply like cookers. Also there is a need to work out how to draw up specification within the legal frameworks provided from EU level. And also, to frame them in such a way that you can meet your local suppliers and attract them. And then there are distribution problems within the project of Sustain share the stakeholders meetings and here we have both catering manages from hospital and schools, we have farmers, we have farmer organisations, we also have distributors people actually involved in logistics and distribution and can reduce costs by integrating the distribution from different farms on the same way across different schools. So there is a whole range of logistical supply matters which need addressing as well as skills and infrastructure supports. At the moment these alliances are still practice so if you are going to rule out european wide scheme to get food through these levels and be

consumed by children then you need to think through some of these challenges levels.

Finally I will talk briefly about environmental dimensions. Obviously, the projects we have been talking about are being concerned about environment as well as nutritional standards. And there is a question about how we can address the supply of the right types of food in environmentally benign ways. How do we seek to deliver fish stocks for example where stocks are depleted? What types of fish do we go for? How do we bare up F&V productivity with other environmental concerns such as pesticide controls, water depletion, water shortages. And how do protect and enhance biodiversity throughout choices of supply? Some of these issues are being covered elsewhere in the conference.

I just want to drive your attention to two current pieces of work which have been done on a interdisciplinary nature in the UK, the Rural Economy Land Use program (RELU). These are designed to be interdisciplinary projects which are trying to address land use challenges. Within this range of projects there are a couple which are focused more particularly on food production for consumption and also have elements of F&V production within this. One example which looks at Public Health and environmental benefits of F&V have focused on soft fruit production how it may be nutritionally directed in a way that there are greater nutritional benefits deriving from the fruit grown, how it is grown and how it is processed. Here they are trying to add another set of priorities. Traditionally standards around F&V and variety choice have been driven by facts such as optimising yield, the appearance to the fruit, shelf-life not necessarily health properties in a *sense more cultivated* may be healthier or have greater benefits than others nutritionally. They have been studying soft fruit strawberries, raspberries, blueberries for example identifying cultivar type, ripeness and harvesting, timing and techniques as e.g. the use of UV regime and UV-transparent polyphene all in attempt to enhance the beneficial properties of polyphenols derives from these soft fruits. This work is still in progress but there is an initial revue of the work available.

There is a report on another project which has been trying to match up the public health/environmental benefits of locally produced F & V compared to air freighted produce. This is in concern about food miles and the potential introduction of air miles or carbon miles as a label which has been put forward by one or two of our large retailers in the UK. Here they are focusing on freshness as a key for health benefits but comparing the two they suggest that practices such as type of processing where/when the *b...* takes place is going to be frozen F&V, the time of delivery to the point of consumer purchase may all play a key role in whether the air-freighted fruit is more environmentally friendly or the local produced, particularly in case of vegetables. For example air freighted vegetables, when they are out of season in the UK they are brought in from sub-Saharan Africa with short delivery span of 24 to 36 hours which retains there freshness enough to make them more environmentally efficient that frozen stored produce out of season being used at the same time in the UK. So these lifecycle analyses are now being developed.

Finally just move on a wider policy debates, the future directions of CAP reform. What we have at the moment is a situation where the environment actually is a part that has being recognised in the CAP support and its reform rewarding public goods provides by multi-functional agriculture. Public health gain is not really explicitly included amongst these public health goods currently. Food safety is there but in terms of nutrition advance that is not there. The supports are de-coupled from production and then moved to rural development and Rural Development funding is a more potentially lever for the promotion of F&V. But, there is current suggestion de-coupled from production support for public goods which environmental landscapes features are at the forefront. We also see a debate happening at the moment thanks actually to the UK presidency of the EU which ask to this to be tabled. At the same time we see this taking place against rising food prices globally where concerns about food surplus which of course are the one overshadowed production regimes of the CAP gave them bad names now being match with the current situation where food scarcity is gloaming at a global level or is this becoming more visible? Of course me always have millions malnourished people in the world, it is not a new problem but, the *ef...* upon scarcity is now becoming the forefront policy debate. Another current de-coupled aid is that land has to be kept in good environmental agricultural condition. So there is an argument being put at the moment about rebuild European national food production but keeping it supported by high standards as food safety and animal welfare. And both the France and German Agriculture Ministries have advocated this in the recent months. On the other hand our UK Treasury is saying that de-coupling is a way forward wants to see complete aiding of supports by 2013. So there is a healthy exchange of views going on from this opportunity for debating re-direction. And of course this would accelerate now as we move towards 2013 in the future of agricultural supports would have to be discussed and decided.

In conclusion, what we have at the moment as illustrate through the European school fruit program as policy window of opportunity which is opened up and this is very well and it is important that it is being taken. But in the longer term we need to think more broadly and deeper about how we link consumption of food to production via public health benefit and lower environmental impact. We also need to think about and this is the RELU project in the UK first attempt to how we link R&D around production of food to consumption needs that we need more about health consumption environmentally present consumption in how we develop and research production of food. The third point is that throughout the supply chain the governance of supply chains and operation has important consideration that need to be integrated into our thinking. And finally, in relationship to that we need to look at policy implementation on the ground and seek promote best practice where we can.

Towards an European School Fruit Scheme

Lars HOELGAARD

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A year ago, I participated in this annual conference on obesity and F&V and I have to say that this was an eye opener for me. Up to that moment I thought, ok, we know about obesity and we know it is a problem, but is it really that bad? And as I was presented with the figures, it came clear to me this is a rather serious problem in our modern societies, it is something which is growing and it is something in fact which might result in huge health expenditure and in that sense it is a serious issue. It is an issue which will be creeping up on the politicians' agenda. If we do not manage to invest in our public health in our ways of living, our diets, we are going to exacerbate the problem into the future. We are going to have a snowball effect. It is now time to address this issue and to stop the snowball from rolling and becoming greater. We need to start doing something serious about it. It is not an easy task. I have been participating in some of the sessions that we have in the Commission regarding the Task Force on obesity. It is a complex issue which involves many different elements. It is not just about consumption of F&V as we know, not just about the question of having physical exercise, not just doing more about it in the curriculum of the schools, not just about the way we live or related to the increase in single parent families, not just about the attitude, it is also about attractiveness, availability, presentation and so many factors involved that all have to be taken into account, and my message is that a possible EU School Fruit Scheme is just one element, which can contribute in the fight against obesity. It is just one element, but an important element, in this complex matrix of different elements playing into the issue of obesity. And, hopefully, an element that could grow, an element that could contribute and provoke a change in our approach, ways of living, in terms of our diets that could have effects that go beyond the simple narrow issue of an European School Fruit Scheme.

The ball started rolling basically last April, when we were right in the middle of the process of reforms of the market organization for F&V. I saw this as an opportunity to use an element here that we had not really thought about. We could already have put a School Fruit Scheme into the proposal and perhaps had it adopted and I would not be doing this presentation. But, better late than never, and this is why we are here after one year of intense discussions which we hope will lead up to a proposal from the Commission that will result in an EU School Fruit Scheme. I am convinced we will have a Scheme, but today I am not sure about the content, about the form, the dimension, but we will have an EU School Fruit Scheme one way or the other.

We went through a process of consultation, the declaration that was put into the Council conclusions on F&V reform said that we would study the issue of a School Fruit Scheme in terms of its practicability, efficiency, justification and see the different options and evaluate these and on that basis present a proposal. We also have the European Parliament which has been active in this discussion. The European Parliament is now waiting impatiently for such a proposal coming forward

and in that way there is already now a sense of urgency which is being built up at certain levels.

Mr Barnier as well has the idea, as we see it in the communication he has delivered just recently, to come forward with a School Fruit Scheme in France which will distribute F&V in schools across France in about a thousand schools based on some of the models that are already in place in some member states. In fact, the communication is a little bit ahead of eventual events because it is referring to an upcoming EU School Fruit Scheme which means that we have to deliver on that, come up with a proposal.

We have done an impact assessment that I was working on with my colleagues just yesterday. We have gone through a process of internal consultations in the Commission, and Felix Mittermayer and his colleagues have been involved in this. Working quite intensely on it and having a number of inter service groups, discussions with stakeholders and internet consultations, we had reactions from 122 stakeholders, and in fact it has been a quite positive experience. We have had quite clear support, not just for a EU scheme which I think by now is a done deal, but also to have an EU scheme with muscles in it with a contribution from the EU budget which will assist in health in promoting and sustaining or introducing and encouraging the introduction of School Fruit Schemes across the EU.

The objectives that we have with the School Fruit Scheme are basically three general objectives which are mutually supportive. First objective is clearly related to the CAP in relation to efficiency, productivity, ensuring the security of supply at a reasonable price to the consumers and ensuring a reasonable income also to the farmers. Second objective: to contribute in the fight against obesity by increasing consumption of fruit and vegetables by influencing children when their eating habits are being formed. Third objective to provide an EU value added and demonstrate the EU cares about the concerns of its citizens.



IV. Conditions for successful implementation of a School Fruit Scheme

- The SFS should be flexible, recognising differences in culture, school food environments and administrative arrangements.
- It should ensure a variety of safe, ready to eat, high quality, culturally acceptable fruit and vegetables and avoid simplistic notions as to what product is "best".
- To ensure equality of access to the scheme, no charge should be made for fruit & vegetables in schools.
- The minimum target of 400g/day should include 150g of fruit and 250g of vegetables; fresh, frozen, chilled, canned and dried produce; no more than 100 ml of pure fruit juice based on clear guidelines regarding eligible products .
- Convenience/processed foods should be eaten in moderation (as they may also contain high fat, sugar, salt).
- The SFS should encourage a broad partnership between education, health and agriculture and involve private, public and civil sectors.
- This partnership would, in particular, be important for the choice of produce, which should be based on nutritional value and pedagogical considerations. The taking into account of environmental and social concerns – based on objective, non-discriminatory criteria - would be a plus.
- Schools participating would present a nutritional strategy explaining how the fruit & vegetable scheme would be integrated into the school's curriculum.
- Fruits and vegetables have to be made available in the schools one way or another.
- Rules and eligibility should be kept simple to encourage participation by Member States, the EU fruit and vegetable sector, government agencies, schools and other relevant stakeholders
- Accompanying measures that reinforce the efficiency of the scheme and its sustainability should be compulsory (e.g. educational material, promotion kits). Produce alone is not sufficient.
- Projects should be set up on a long-term basis, as their benefits will become visible in the long-term.
- The removal of competing foods, in particular in vending machines, in the school environment i.e. savoury and sugary snacks and sweetened drinks is recommended. In turn a replacement with vending machines with fruit and vegetables could be recommended

Evaluation of diet and health trends considerations on study design

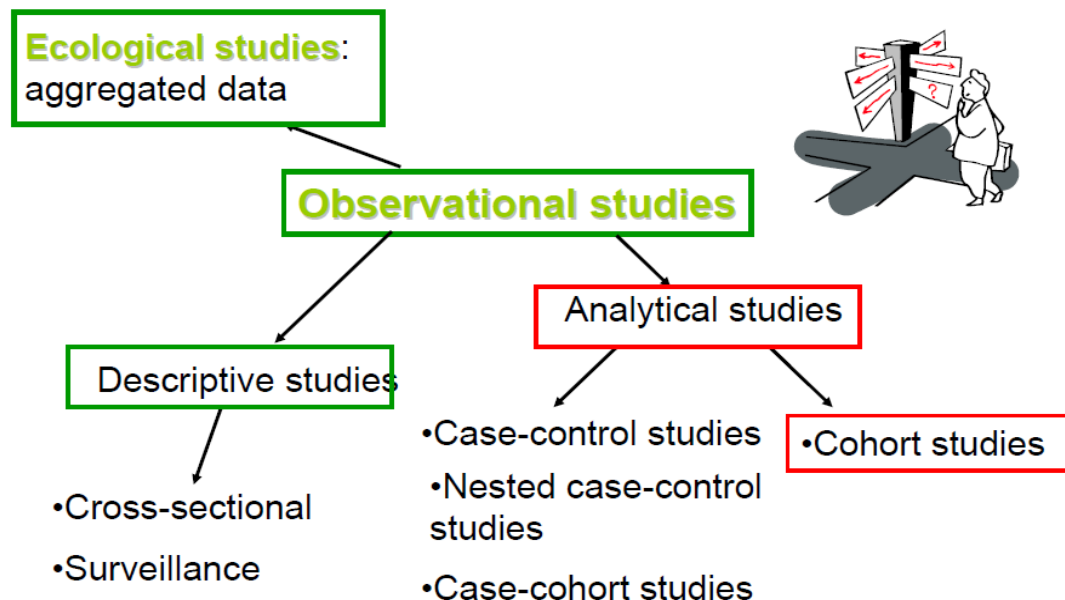
Elio RIBOLI

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Officially Agriculture does not talk about Health and we are very pleased that in practice Health is coming into the agenda. I started 20 years ago a project called EPIC and those days of the prospect investigation on cancer was founded by the European Cancer Program but was created in 1988. In 1988 when the newspaper came out by saying Europe is financially giving putting together 20 million echoes for fighting cancer. Then few days later there were articles saying this is a scandal because the European Commission is giving 1.1 billion to support growth of tobacco and then somebody was saying, tobacco after all is a vegetable! So that was 20 years ago with 1.1 billion support from Agriculture for tobacco and now there is a support for F&V. I think we came a long way and for European enthusiastic this is very important.

I will try to draw you attention and the attention of all those involved in promoting F&V consumption on the importance when this is done in a structural way of building an evaluation. From a point of view of the epidemiologists on working on nutrition and chronic diseases there are many ways in which we can investigate changes in diet, how is diet changing, the impact on diet changes in health.

Options Study Designs



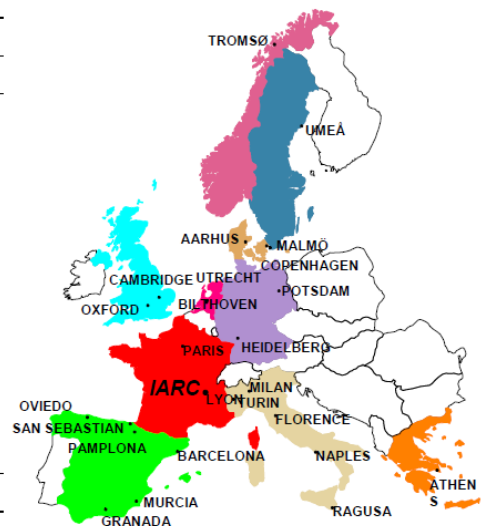
The traditional way is that we do what we call observational studies, do not pay too much attention to the forest that is there, there are many ways of how to get things. One can look from aggregate data in the population; can look more at the individual data and so on. Now what is the opposite way of what is called the hard science is the experiment to give a treatment, to give placebo or have a control group and then

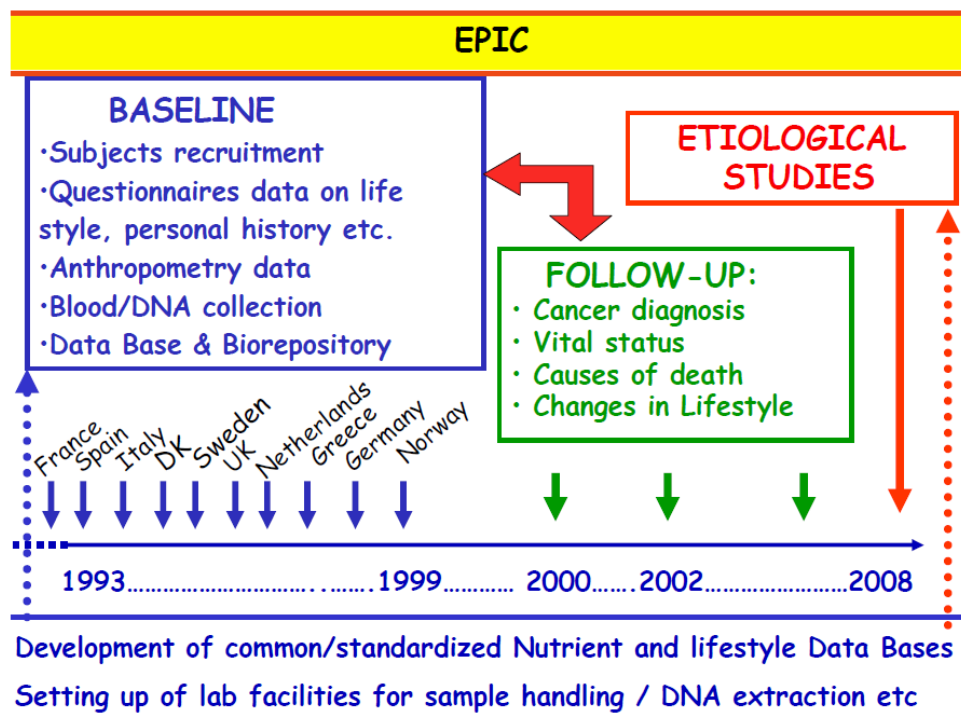
if it is a disease then you may compare those that are cured to the not cured and see what the treatment was. So one hand we have the observation where you not intervene on whether people take a drug or eat on apple and then on the other hand you have the extreme that is the randomized clinical trials. Now clearly when we talk about nutrition in populations we are very far from the randomized clinical trials and we tend to be much closer to the observational studies. So, the usual way of seeing the evaluation of what happens from a nutrition point of view is to observe. One way of observing the study I just mentioned is building up prospective studies in the population at large and this is the European Prospective Investigation on Cancer and chronic diseases that was originally founded from the early 1990's by the DG Public Health that is now called the DG SANCO. Thanks to the European support, thanks the nations support we collected very detailed data on diet, obesity, physical activity, lifestyles and smoking, drinking and that entire half and middle subjects from over 400'000 of this subject also collected blood samples that are stored have been used very actively for studies on bio-markers of diet. The reason I am setting this study is because it is probably the largest example existing in the world over studies focused on nutrition with the in depth data resentments and with collection of blood samples for bio markers. We can learn a lot from this experience from all these countries to see how to evaluate what happens when F&V are proposed to children in schools.

EPIC

Collaborating Centres and Participating Subjects

	Participating Subjects	
	Questionnaire	Q+ Blood
France	74 524	28 053
Italy	47 749	47 725
Spain	41 440	39 579
U.K.	87 942	43 141
Netherlands	40 072	36 318
Greece	28 555	28 483
Germany	53 091	50 678
Sweden	53 826	53 781
Denmark	57 054	56 131
Norway	37 215	31 000
Total	521 468	414 889

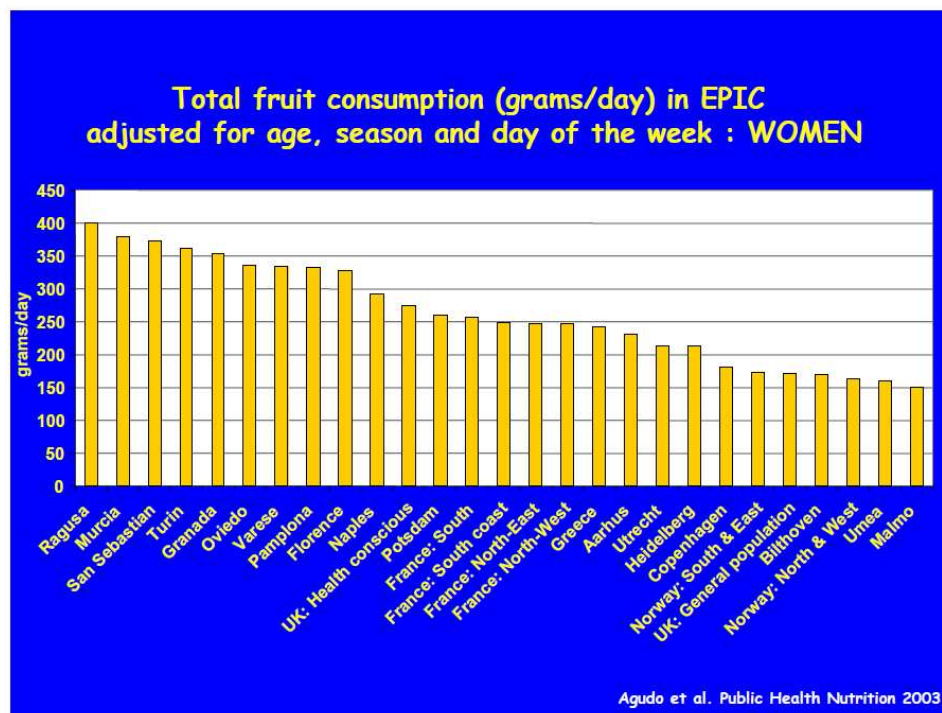




In two words a prospective study means to collect a lot of data at baseline and that will come back to the concept of baseline for us was diet, physical activity, lifestyles and these are all the countries where this was done at the size of about 50 000 subjects per country. Then you build up a follow-up you want to see how diet changes, how people evolve, people who are going to give smoking, drinking, changes in weight by the way the European Commission has just found the project beginning to look and determine weight changes that is called Panasia and then eventually you can try to link all these health events with the baseline and this is what is happening because 40 to 50 papers per weeks now are linking diet and different health outcomes.

The big problem about diet is this is difficult as it has been said at this conference. It is one of the fundamental difficulties we have whenever we want to investigate nutrition and health. In EPIC, there has been a major experience in standardized ways of collecting data in 10 different languages, 10 different countries and now this has been expand also to collaborations with additional non original EPIC centers and on key element was to develop computerized interview that exist in 10 languages and that are standardizing methods. But, the flexibility of adapting to the local diet that is called Epic Soft. We got 38 thousand subjects answering to these methods in addition to the traditional questionnaires. It is a very well structured highly guided way of collecting data on what people eat studying from the morning to when they go to bed. It can be done on children; it can be done with middle age people and so on. Similar methods are now being developed in the US and in other countries and can be translated into a web based method as it has been done to make it cheap and friendly. This is one way in which you ask what they took for breakfast, ask details in a structured way with windows that open automatically and so on. The interviewer is driven or the subject is driven in a standardized way to provide information that becomes then comparable between subjects and between countries. Comparability is a key method if we want to understand what happens so for example if there are standard units. There are standard recipes, whenever a subject want to eat this

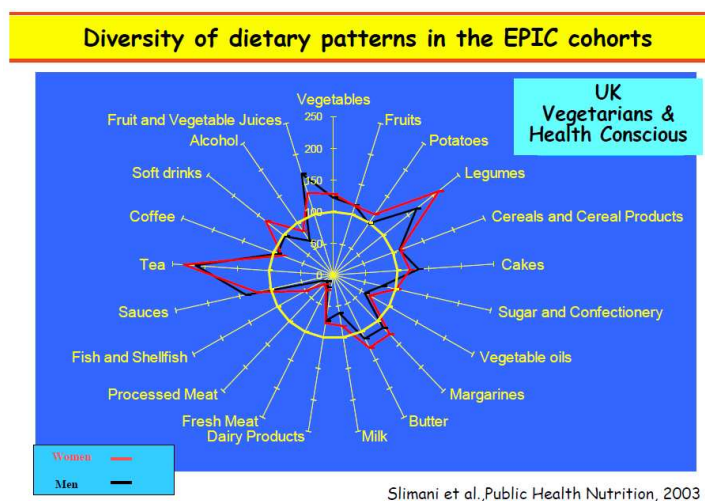
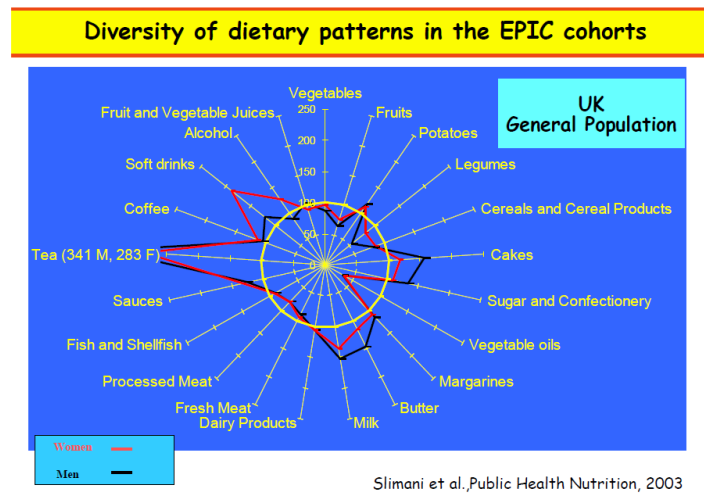
particular food, there is particular recipe that comes up and can be modified or adapted. There are standard portions; photos that refer to none perceive weight of what is in the plate for foods that are linked electronically to the questionnaire. As an anecdote, when we started with this tomato slice portion, the smallest portion was introduced before extending the study in Sweden and then we had to introduce smaller portions of the smallest portion because the smallest portion of everywhere was too large for Sweden. So, what is small and what is large is not standard. And, the questionnaires just for the nutritionists give at the end a check up of whether what has been collected reasonable in terms of proteins, carbohydrates, lipids, alcohol, whether there is something strange so that the interviewer can go back. This is not a test to be done this was but just to say that there are 24 centers around Europe that have been working with these instruments in a standardized way of the past 15 years.



Now what you get out of this is some interesting data for example you see that one of the high priority region identified in the program for fruit at school is Sicily and the first on the left is Ragusa has a great name for a city in Sicily. Then the highest consumption of fruit in our 24 regions are in Mursia, San Sebastian and so one and down you have Malmö in Sweden and the Uma in north Sweden. It goes from 250grams/day to 400grams/day. These are adults older than 35 so it might be than in Sicily you need to push children now to eat fruits. But the baseline is not the same. It is the obvious consideration. If you want to evaluate, keep in mind that the starting point varies from simple to the double. For vegetables it is about the same, going from 100grams/day to 250grams/day. Now these figures are obviously different and this is what you find in FAO statistics. Because people eat is not what people buy which makes a huge difference. We know that a lot goes to garbage, a lot goes to the dog and the cat so this is really what comes into the plate and from the plate goes to the mouth that has been obviously measured. Now do we eat all the same in Europe? Obviously we do not eat all the same in Europe.

Now I am going to show you graphs that show the messages whenever there is a European program we really need to take into account the European diversity which is beyond imagination in diet.

The yellow circle is the European consumption average for that particular food within EPIC. The spikes red and black are the matching percent of that particular population diverted from the European average. So, you can see that thanks to European commission and thanks to this study we discovered British people drink tea and drink tea so much that it goes out of the scale. But more seriously you can see



that consumption of fruit is quite low and is actually 20 or 30% below average consumption. Soft drinks are exceptionally high and consumption of vegetables is just about where it should be. And consumption of vegetable oils is desperately low. Now we have 35 000 vegetarians from UK in our study and we can see western style consumption of vegetarians tend to avoid meat

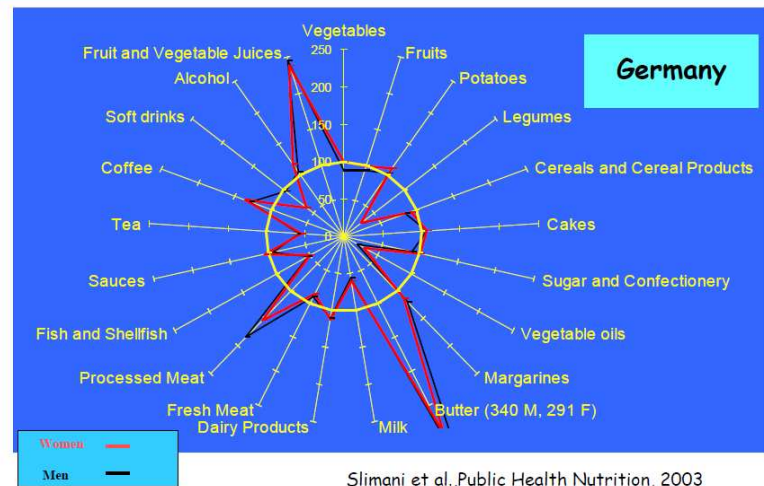
but unfortunately to consume soft drinks, to consume sugar, cakes and to have a quite modest consumption of F&V.

You go to Germany and again you make the big discovery that butter is a huge weight and that fruit juices have a huge weight in Germany. I particularly found it difficult to find any healthy arguments in favor of fruit juices. There are no studies that have ever found that fruit juices are associated with a reduced risk of cardiovascular diseases, there is no protection cancer, there is no protection on colorectal cancer, not on stomach cancer, and there is a clear association of fruit juices with obesity. The consumption of juices increased by 2 to 3% that the past 15 years. I think this is something we have to monitor very carefully and I am glad it has been put in the European program.

Diversity of dietary patterns in the EPIC cohorts

Now it is a completely different pattern when you go to Italy and Spain. You see that fruit is 100% higher than the average and that correspond also to the very high production. You see that meat for example, that sugar, soft drinks is trivial and so on, these at least in adult peoples.

In Spain you find the very well known specificity of very high consumption of red meat, very high consumption of fresh fish, high consumption vegetable oils, high consumption of F&V and so on.



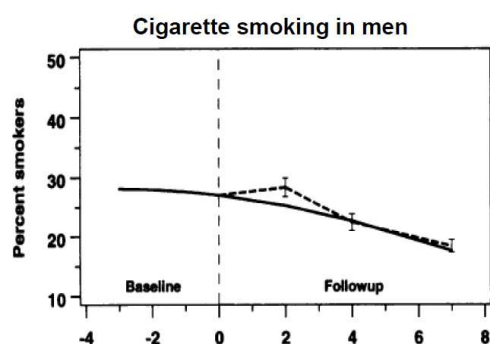
So you can see how different we are and that one size does not fit all and that we need to be very careful.

When we go to intervention I will just drive quickly on this. We have, my message is we should not postpone evaluation after intervention. We should have a baseline before dietary intervention otherwise we will be in the usual mess of not knowing how it was before, of looking of what it was because obviously there are different evaluations that is the evaluation from the efficiency point of view of whether the program works. Is the food brought into the school? Is it properly cooked? Is it eaten by the children? Yes, but we want to do whether there is changes in dietary habits. So back to our plan of quasi experiment design ideally, the closest I can propose based on experience, not mine but those of epidemiologists is the community controlled trials. The closest we go to the concept of a community controlled trial in implementing this program, the better it is.

What is community controlled trials? It is called different ways but is whenever you go to the whole population and you try to change something, you may do it in this way. When you want to try to see , to do, to set up in a way that you compare communities whether this is done or not done or done in a method A versus a method B but you want to plan it from the beginning. This particularly apply to mass education when you want to change people's knowledge and attitudes and when you want to finally have an evaluation of the efficacy of what you have done. It is a very simple concept. You go to the schools with the F&V, schools with a program, schools without a program, a baseline and then after intervention diet and see what has happened. To do it obviously it is much more sophisticated than that but I am just saying that conceptually it is simple. Now you can also modulate this in two ways. You can think at the unit of observation, important concept in epidemiology and sociology. The unit of observation can be the individual child or can be the school. You can simply say on average where intervention has been done in one school is in

that school the children 5 years later are consuming more F&V. Or you can say John Smith is 4 years older consuming more F&V? It is a very important complex issue that cannot be solved in two minutes because we are talking about children. They grow in weight, in height, in calories consumption. So, you will probably have to integrate individuals with institutions because you want to compare what happened to children of 6 years old but with other children will be 6 years old four years later and you want to see what a child of 6 years old age will be consuming when he will be ten actually been exposed to the problem. Complex story can not be solved in ten minutes but has to be thought before it is happening.

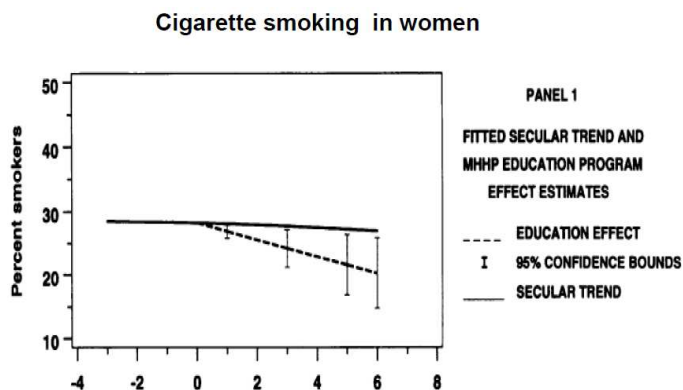
To conclude I just give you an example. It was a very fantastically planned health intervention program done in Minnesota. Among many things they wanted to change cigarette smoking, decrease it. This is what you see in men at the baseline and



after. The solid line is the secular trend and the dotted line is what the people in the intervention did. If you only had the dotted line you would say that is fantastic that these men reduce cigarette smoking. But, the solid line tells you that they did exactly the same that the non intervention group because of the secular trend.

In women you would say fantastic there was a reduction of tobacco use and you would be right because the secular trend was that women would not decrease tobacco consumption in that period in Minnesota.

Without the comparison of the non intervention group there is no way to learn anything about what happens.



This is feasible in the population is somewhat similar to a core study much more similar to a randomized clinical trial. It can be done in real work conditions, it can assess the factors that affect the implementation obviously care should be taken in picking up communities or schools that are representative. And, we have facilitated not giving drug, we do not really any inform consent for giving apples and the point of view on a safe ground.

Q&A

PUBLIC (Mariano VINOGRAD from Argentina): As I am a foreigner probably I could not understand some details because the discussion was very Europe oriented. Anyway we are discussing about the school schemes in European community and the question is for Mister Hoelgaard. You congratulated the Farm Bill and its schools implications. I agree. But here I might decide it is Mister ... from Norway. I can not understand exactly and maybe you can help me why the situation is so different in school systems in Norway where there have a lot of money and operational aspects and why it is so difficult to go on in Europe? Excuse my ignorance but in South America is consider Norway and Europe as something very similar and I see in this way that the differences are really very big.

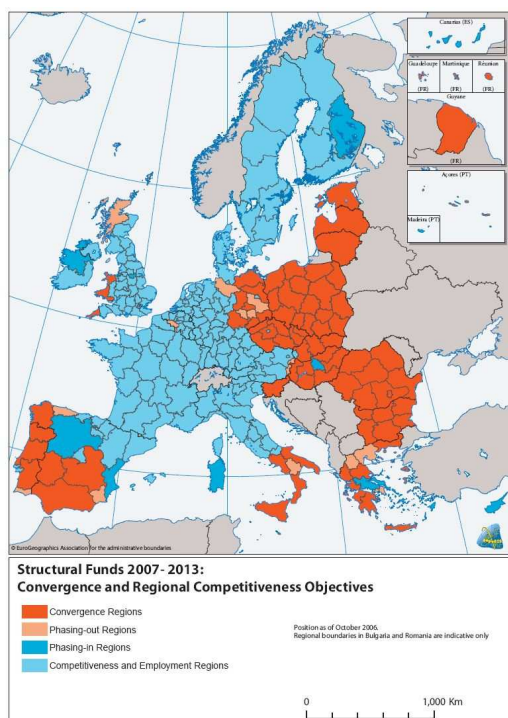
PUBLIC (Corinna HAWKES): Thanks Mister Hoelgaard for your vision that you presented that was quite amazing really to hear highlighted visions that you have for the scheme. I was curious to know whether you vision is shared by the key stakeholders in the farmers, the producers of the F&V, the educators and administrators in the schools and the distributors of the F&V given that implementing such a scheme does face a lot of hurdles and great deal of complexity. So, I was curious to know whether you have support from those sectors and stakeholders.

PUBLIC (Philip JAMES from the Task Force): I was extremely heartened by the development in agricultural policy where clearly DG agriculture is trying to cope with the health requirements while maintaining the economic strategies which have been set out. I just wonder if in fact you can develop this further because I know having been in charge of an agricultural institute for 17 years, negotiating with ministers when they were so concerned about eastern and central Europe because of its huge capacity for F&V consumption. Has the Commission done analysis which take account of the new WHO strategies because in terms of the World Bank calculations there is a huge opportunity for some countries which I guess will include eastern Europe within the EU for actually getting enormous financially economic benefits from promoting agriculture in a way in which the EU promoted milk, beef and sugar production 20 to 30 years ago which such brilliant effect in changing wholly economic structure of the food system?

PUBLIC (Michael MALONI from Irish football, Food Dude program in Ireland): Quickly I should point out and I know mister Hoelgaard spoke about the intensive interventions in the schools with the Food Dude program. It does not stop after the interventions period of 16 days. The focus then switches to the home and the parental provision of F&V thereafter and that indeed is one of the key success factors for the sustainability of that program. Just as a point of clarification, in relation to a question, you mentioned the co financing from member states of being 50%. I am just wondering, in relation to that is there going to be a requirement for industry to provide some of that co-financing because I has certainly been other experiences that

polled on the one hand one could justifiably expect that industry would co finance or provide some of the financing because at the end of the day who makes money out of all this increase consumption? But, in our experience in Ireland it has been incredibly difficult to get industry to co-finance and it will be my concern that if this was to become part of the scheme, to become a priority for the scheme then it may not get off the ground a lot of member states.

L HOELGAARD: First of all to the representative from Argentina, as you said Norway is a rich country, and that explains probably why they can go ahead and have gone ahead as being one of the first ones to initiate the School Fruit Schemes.



They are also at the forefront of the science with the follow up and the monitoring that they have done, demonstrating the lasting effect of such schemes. This is included in our impact assessments in terms of evaluating whether we should have such schemes on a European wide basis. Not that it has really anything to do with it, but Norway is not part of the EU, but that is not so relevant. What is relevant is what I showed on the map, the huge divergence, the huge difference in terms of wealth, in terms of economic potential of the different members of the EU. And I did show on the map the regions in red, which are well below the average in terms of budgetary means and resources. This compared to the country I know best or in France or in Germany and other countries where we have School Fruit

schemes. In particular the new member states have a per capita income situation in terms of tax payer potential which is far below that of other member states. So, there is a need for a high EU budget contribution of 75% to address exactly that shortcoming.

The question about the position of stakeholders: in fact, it came out extremely positive. We had as I said 122 reactions and overwhelmingly the clear preference was for the option number 4, which is the muscular one of what we call the driving initiative that is to have an EU project contribution. I would say 90% or more basically were in favour of this option and that includes the industry. The stakeholders, representatives of the industry are keen in going down this road, they are keenly interested in terms of safeguarding their markets, in terms of providing a market in the future, in terms of eventually increasing that market, in terms of product innovation and the distribution and participation, and that is also an answer to Mister Maloney. I think there are means and ways where we can allow for the industry to participate, not as an obligation. It is envisaged that 50% would come from the EU, 50% from the national exchequer, 75% from those member states which

are in the convergence regions and 25% from the national exchequers. It is an important principle that there is this co financing because it assures that the local authorities, when they are implementing the provisions, are using the money (including their own) in the most rational and efficient way accountable to the tax payer and the budget authority.

If industry has the money, fine, it is not an obligation. If the national exchequer has the money to go beyond the core target group of 6-10 years old including the 4 to 6 years or to include the 10 to 12, that would be something that we would be completely happy about. But the core target group remains the 6 to 10. That is where the minimum effort has to be put in and that is why we are targeting this group.

SESSION 14

F&V AT WORKSITE

Chairs: **J. Milner** et **B. Sahler**

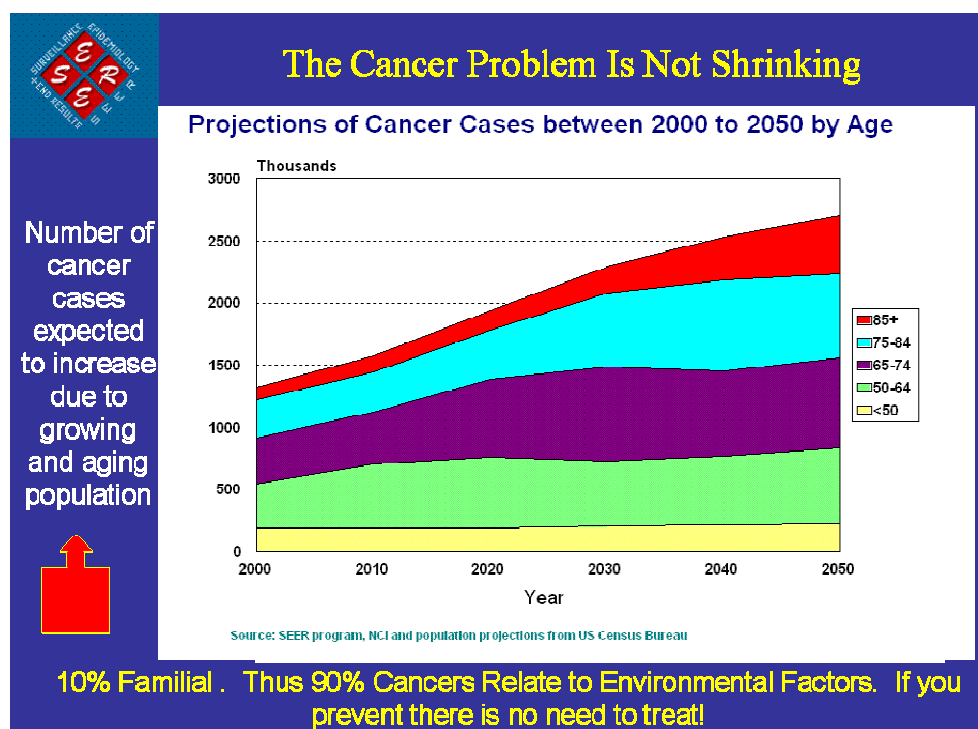
- Introduction. **J. Milner**
- Preventing chronic diseases at the workplace through diet and physical activity. **V. Candeias**
- Worksite-based research and initiatives to increase F&V consumption. **G. Sorensen**
- Successful strategies for sustaining increased F&V consumption in worksite canteens. **B.E. Mikkelsen**
- Improving health at the workplace: where can F&V fit into the equation? **B. Sahler**

Introduction

John MILNER

Division of Cancer Prevention, National Cancer Institute, National Institutes of Health
Health and Human Services, Rockville, USA

There are really unprecedented opportunities for using food and food components for a whole host of things related to human health and well-being. I am going to talk about the workplace in the session but I think we need to step back and understand that what we are really trying to do is to achieve our genetic potential that includes overall performance, capabilities, cognitive and physical performance and well as a reduction in disease risk. We have some pretty good evidences from around the world that changing dietary habits can have a profound impact on everyone. I chose some information from WHO report in 2005 and it says something that we all should be thinking about that is can we actually reduce the risk of a number of disease states by dietary interventions. Most of us will appreciate that globally, at least five of the ten leading causes of death related to dietary habits. Clearly heart disease and cancer are foremost among those. Some data reveal a major impact in terms of life saved and dollar saved through dietary change.



This figure reveals where I think we are headed and that there is a problem in the US with cancer risk in the coming years. This is what is projected between now and 2050 and if you look at those lines you notice that there are not many things that are going down. In fact the risk is projected to double. Part of this increase risk is because of a larger society, at least in weight, and an older society. That is not unique for the US, but is also likely to occur globally. The only way to stop this trend is to prevent then we do not have to treat.

Preventing NCD in the workplace through diet and physical activity

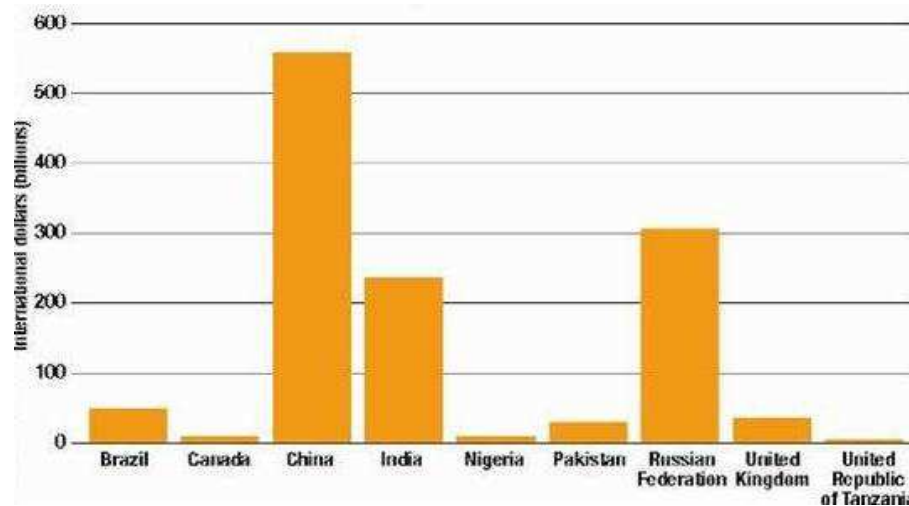
Vanessa CANDEIAS

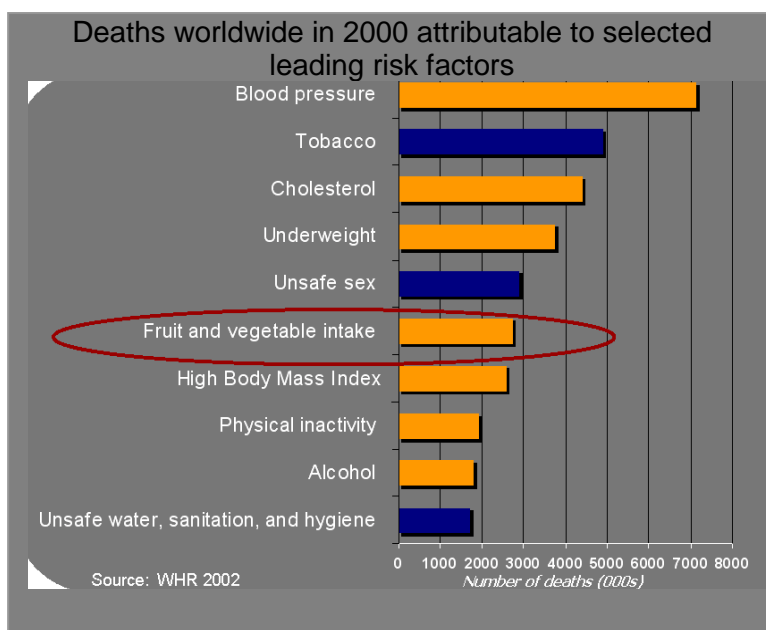
World Health Organization, Department of Chronic Diseases and Health Promotion
Surveillance and Population-based Prevention Unit, Geneva, Switzerland

It is a global problem for chronic diseases in general and I will start my presentation touching exactly upon that. Then, I will go into more details to describe an event that was jointly organised between WHO and WEF (World Economic Forum) and then according to the main output of that event, I will try to describe why workplace is suitable setting for intervention on prevention of chronic disease through diet and physical activity, some of the key elements of successful programs, a multi-stakeholder approach, monitoring and evaluation, some of the gaps that were identified in current knowledge and then a very brief update on what has happened.

NCD (non communicable diseases) count for 60% of all deaths globally which means that in 2005 nearly 35 million of people died of chronic diseases. Contrary to a common believe it is not just a problem of Europe, not just a problem of the US or Canada but it is a problem that affects more low and middle income countries. In terms of money spent, these countries will also be the most affected. On the graph you can see that in China more than 500 billion dollars can be lost due to chronic diseases which are a huge part of the budget for national health.

**Projected
foregone
national
income
due to HD,
stroke and
diabetes
(2005-
2015)**





We know that the common underlined and modifiable factors are well known: unhealthy diet, physical inactivity, tobacco use. These would lead the cause of death. In 2000 when WHO looked at the selected leading risk factors we see that 7 out of ten of these risk factors were related one way directly or indirectly to unhealthy diet and physical inactivity and F&V intake is highlighted as one of the key risk factors.

In response to that growing global burden the WHO in the World Health Assembly of 2004, the member states endorsed the Global Strategy on Diet Physical Activity and Health (DPAS) which is a tool with several policies option that allows member state to conduct work around diet and physical activity. Within this global strategy Workplace is clearly identified as an important setting for action (§62):

"People need to be given the opportunity to make healthy choices in the workplace in order to reduce their exposure to risk. Further, the cost of morbidity to employers attributed to noncommunicable diseases is increasing rapidly. Workplaces should make possible healthy food choices and support and encourage physical activity."

This global strategy also the mandates for WHO work in this area which was the basis for the collaboration of WHO and WEF.

Basically we met and we decided to organise a joint event that would bring together several stakeholders, Ministries of Health, NGOs, academics, private sector and all came together in Dalian, China in September 2007. We had the main objectives of: reviewing the current state of knowledge on NCD prevention at the workplace, highlighting why the workplace is a suitable setting for NCD prevention, analyze the benefits and cost-effectiveness of the interventions at the workplace, discuss monitoring and evaluation and then identify roles for the different stakeholders and mechanisms for their interaction. All the work, all the discussions in China was focused on diet and physical activity. It was assumed at the beginning of the meeting that we would not look at tobacco because it has been fairly discussed, there has been and there is already a lot of information related to it. So, all the mentions that were discussed were specifically focusing on diet and physical activity. This meeting brought together more or less 50 participants from all stakeholders and the main

output was the report that you can download on the website (<http://www.who.int/dietphysicalactivity/workplace/en/index.html>).

In a much summarized way I will take you through the main points that are gathered in this report. What we came to the conclusion is that one of the strongest factors that we can point is the large proportion of the population that has the potential to be covered by these interventions. If we consider that 65% of the population is part of the workforce this can give us a proportion of nearly 3.1 billion people to intervene with. Looking at the evidence that is available, we concluded that the workplace programs that targeted diet and physical activity were effective in changing lifestyle behaviors, improving several various health-related outcomes and facilitating organizational-level changes.

When we look at lifestyle behaviors most of the studies that were conducted registered and increase in physical activity levels, an increase in intake of F&V -and I won't go too much in detail in the study because the next speaker will touch on it- and reduction in intake of unhealthy dietary fats which are the main priorities in many of the policies that are implemented. When looking at the health-related outcome, reduce BMI, reduce body fat percentage, reducing blood pressure, risk factors for diabetes, musculoskeletal disorders, several of these health-related outcomes were improved by interventions at the workplace.

In terms of organizational level changes, there was a reduction in absenteeism, there was enhanced employee productivity, improved corporate image and moderate medical care costs. One of the studies was very interesting to see that some of these organizational-level changes for example in terms of medical care costs or absenteeism that the percentages were between 25% and 35% which is very significant.

If we look at the several studies that were gathered the main elements of success were highlighted. We see that when the program objectives are linked to the business objectives, this will favor success of the program. It is essential to have top management support, without it the program probably would fail. It was also useful in some of the studies establishing employee advisory boards that were also as a communication between the employees themselves and top management. Effective communication is obviously a key for success but on top of that it is important to create supportive environments. What we have seen in many of the presentations is that providing information is not enough. If you provide the information and if you provide an environment where the healthy choice is the easiest choice that would facilitate the adoption of the behavior that we are trying to promote. For example in Malaysia one of the studies that we looked that with blue collar workers, microwaves and scale waves and water coolers were displaced in the areas that were frequented by the employees and this among different health-related outcomes had a significant decrease in their blood cholesterol. So it is essential to look at creating supportive environments, also the use of incentives for people to participate in the program. Sometimes some of the employees would think they have already done their work and do not want to go or participate in the sessions or go to the fitness class. So, it is important to provide incentives for the persons that are implemented in the program and for the persons that are benefiting from the program. Obviously the point that is

common to any health promotion intervention is goal setting they have to build on self efficacy. They have to try to format the social environment, the social norms, create social support and the program has to be tailored to the audience that you are addressing. Two other elements of success that I will look a bit more into detail is one the multi stakeholder approach when several stakeholders from different sectors are involved this provides a more solid basis for the implementation of the program and the other one is monitoring and evaluation.

A model for stakeholder interaction was suggested and what I think is important to highlight is that either being interaction between trade unions and top management, either being interactions between government and private sector, it is important to follow basic principles of cooperation because otherwise it would be very difficult to sustain the relationship. There has to be sharing of responsibility, sharing of power, it can not be all the time the government taking the lead. If the relationship is strong and there is trust as well then the power can be shared. It is important that stakeholders trust each others so there is transparency in there communication and everyone knows that they are working towards the same objectives. Because so often things become difficult, it is important not to blame and not to say this is the government fault or this is the private sector's fault.

When looking at monitoring and evaluation and we heard it a lot during the sessions, it is fundamental to include monitoring and evaluation in all programs. We have outlined five steps to help when looking at developing and monitoring systems. The first step is to ensure that M&E are included in any WHP policy or program with a budget line allocated for this purpose so that when it come to the end of the project or program the program manager would not say he/she has no budget left and want a devaluation. It is important to put it in the budget right from the beginning when the program is being developed. If there are existing activities, then why not link into those so that it easier to perform. And, identify suitable indicators, different phases of implementation; different phase of development will require specific indicators in order to see how the progress is actually going. So, it is important to identify them and have a certain flexibility to see that if the program is going a little bit different than what was initially planned then indicators have to be adjusted. If the budget allows it, if the program allows it, it is also important to consist to carry out the evaluation in a consistent manner and if possible several times and periodically.

Steps	Action
1	Ensure that M&E are included in any WHP policy or programme developed and that a budget line is allocated for this purpose.
2	Identify existing M&E activities and ensure that the existing data, if relevant, can be used to enhance the WHP policy or programme being developed
3	Identify suitable indicators
4	Carry out the evaluation in a consistently repeated manner to possibly revise or better adjust the implementation activities
5	If feasible, repeat the evaluation periodically

There are different types of data that can be collected according to the different stages to the program. There are the formative evaluation, process evaluation which is particularly important in workplace programs so that whenever we look at the results whoever is looking at the results of the programs from the outside can understand what was the process that led to success or failure of a certain intervention so that they can look at it and ask themselves if they should replicate it, if they can replicate it in their own company in their own country. There is also the intermediate evaluation health impact that is important because we are talking about workplace, to look at the economic and work factor impact. Automatically that can determine the way you convince a top manager to put a program in place or not. What is also fundamental is when program is being implemented and evaluation is being carried out at all these stages it is important to ensure the correct use and dissemination of data. It is important to ensure confidentiality of the information shared otherwise the employees would not trust the person conducting the study and they would not report back on the results.

In terms of gaps in knowledge it was highlighted that a set of best practices would be most helpful, best practices that could reflect global diversity and also that would be flexible enough that someone in China could look at those best practices and adapt it to its own reality instead of having to look at it as for example a model from Europe. It was also said that standardized designs for studies examining the economic outcomes and impact of these programs are lacking. It is important that the economic benefits or the cost effectiveness talk to the heart of managers so if we go and say this will reduce 25% of your medical care costs then that is a very strong argument. It is also important to have validated tools for the information collected around diet and physical activity and this very strongly emphasizes the lack of case studies from low and middle income countries. They are the countries that potentially will have most work so it is important to know how to deal, how to implement such programs in these countries.

In conclusion the workplace is an appropriate setting to address dietary and physical activity habits. The key elements for successful programs have been identified. Monitoring and evaluation is key to any program that needs to be developed and implemented. Also multi-stakeholder approach will be fundamental to success. And

more information is needed on cost effectiveness, on the cost benefits and for low and middle income countries.

What happen to our latest report that was just published this year (<http://www.who.int/dietphysicalactivity/implementation/toolbox/en/index.html>) is that we are translating it into the six official WHO languages and this one of the tools that we used whenever a member state wants to develop a policy or a program, we have several tools that we can share with them.

Q&A

PUBLIC (Mariano WINOGRAD from Argentina): I take part of a report of the international label organization called Food at Work. In this report we find that in some cases the companies do not have canteens then it is not possible to have the lunch into the factory or the enterprise. What is the role you can suggest us as the ticket as health promoters during work time when in the company there are no canteens or places to have lunch in the enterprise?

V CANDEIAS: If there are no canteens, if there are no specific places to have lunch that would mean that the employees would either bring their own lunches from home or they would go to the nearby restaurants to eat. As the health part of the program, I think it is important that all employees are well informed. In that case communication on health promotion and good distribution of the information is crucial so whenever they are planning their meals they can remember the information that would constitute a healthy meal to bring to work. Also, if there are no places to eat, they can still have a place to seat and have their meals so, if they know what to bring it might be easier to work on that. For example in Malaysia they still have no kitchens, they had no specific places for their employees but still they found room to have microwaves. Of course it involved that they have electricity. Microwave is an easy tool for the employees to access.

PUBLIC (Mariano WINOGRAD from Argentina): My question was oriented to the tickets and the companies who apply tickets. There are companies who apply tickets to the workers and with these tickets they can go to have lunch outside the firm. Can the ticket companies can be invalid for this health challenge?

V CANDEIAS: I do not know if the companies will have any restrictions in the restaurants around them. But, if they could be communication between the companies and the restaurants, I do not know if the employees can go to any restaurants or only to a certain number of restaurants.

PUBLIC (Mariano WINOGRAD from Argentina): Only to those who accept those kinds of tickets.

V CANDEIAS: Then communication between the employer and the restaurant to improve the menus is key to success.

J MILNER: I also have a question on the WHO report that we can download. Does that actually have the information on success stories that you can actually go back to those done by countries?

V CANDEIAS: Each of the key elements of success that I have highlighted has a case report after it. We have a textbox explaining the theory behind these key elements and then examples that were carried out by wherever the example could be found related to it.

J MILNER: That is probably going to be the most important information for us to go to so we do not reinvent a wheel.

PUBLIC: Could you explain the difference between the formative evaluation and the process evaluation?

V CANDEIAS: Formative evaluation will be the done that you do at the start when you are planning for the intervention. You have to analyze your target population. Then process evaluation relates to the implementation process itself, not so much the type of study that you did in its assessment, what you studied before designing your evaluation on the implementation of the evaluation itself.

J MILNER: A question about what I was saying at the beginning with the data that were presented. That actually gave some informational life saved and dollars saved. And I wonder if we can get more of that kind of information across countries because it seems to me that is going to be a selling point to most managers to the question why they are going to invest in a microwave e.g., what does that going to mean to them?

V CANDEIAS: That is crucial but that information is not as easily available as we would like to. WHO has a report from 2005 on prevention of chronic diseases that you can also access through our website and that will have a bit more of information.

Worksite-Based Research and Initiatives to Increase F&V Consumption

Glorian SORENSEN

Center for Community-Based Research Dana-Farber Cancer Institute, Boston, USA

I would like to acknowledge my collaborator on this presentation, Lisa Quintiliani. Lisa and I made some contribution to the WHO report that was developed last year so you may have a few common themes with some of the things that Vanessa Candeias had discussed and some of the information that I will provide in my presentation.

We have already seen a pretty good overview of why worksites are an important place to present programs that intervene around increasing F&V consumption. Obviously it extends the potential reach across a wide variety of potential audiences. We have seen in the literature that there is a concrete evidence base for effectiveness in a number of areas. In addition, because worksites are a place where many of us spend a large chunk of every day, worksites are a place where we can provide influence at a number of different levels: at the individual level through educational programs, and also at the level of broader work environment in terms of making changes in canteens or cafeterias, and in broader policies that may affect our dietary patterns. In addition, by making some of these changes we can provide long term support to help sustain behavior change over time. This is particularly important because we all know that long term maintenance is particularly challenging.

There is a broad base of support for delivering these types of efforts through worksites. I have listed a number of international declarations or charters or recommendations that really underscore the importance of workplaces in contributing to dietary changes and in providing long term support for healthy diets such as F&V. There is a broad base of international being done in this arena:

- 1996 Ottawa Charter for Health Promotion
- 1997 Jakarta Declaration on Leading Health Promotion into the 21st Century
- 2005 Bangkok Charter for Health Promotion in a Globalized World
- European Network for Workplace Health Promotion
- WHO Global Strategy on Diet, Physical Activity and Health

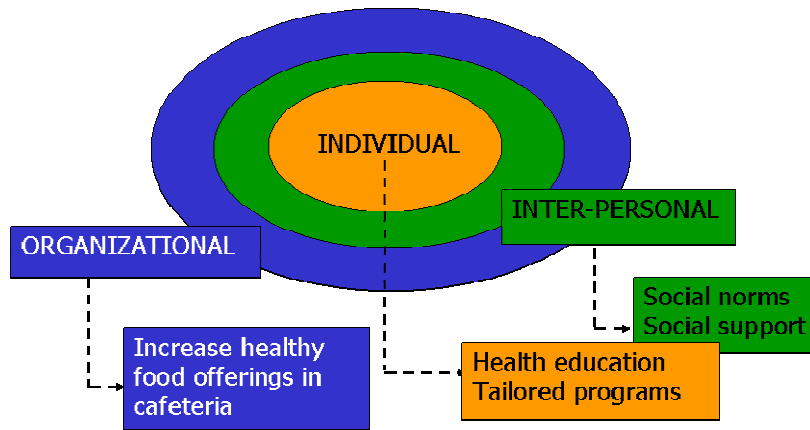
We have already seen some of the points of evidence for effectiveness around worksite interventions. I have listed couples of articles to illustrate the broader ray of research we have in this area.

- Improvements in workplace supports for health behavior change (eg, Matson-Koffman DM et al, Am J Prev Med 2005)
- Increased consumption of fruits and vegetables (eg, Glanz K et al, Am J Health Promot 1996)
- Improvements in other health behaviors (eg, Pelletier KR, J Occup Env Med 2005)
- Weight reduction (eg, Hennrikus DJ and Jeffery RW, Am J Health Promot 1996)
- Economic returns (eg, Proper KI et al, Scan J Work Env Health 2004)

We see clearly that workplace interventions have been demonstrated to improve workplace support for help behavior change broadly and very specifically for diet. We also see strong evidence that these types of interventions can lead to increase consumption of F&V as well as improvement in other types of healthy behaviors. Most of the time these programs are not offered solely targeting F&V alone but might be done in conjunction with other behaviors. Some literature also shows weight reduction impacts and we also heard a little bit about some of the economic returns, of particular importance to employers.

In this presentation I would like to focus on four particularly important components of effective programs and link them to some of the issues that are raised in the WHO report. I will talk about the application of social ecological framework thinking about change at multiple level of influence, look at participatory strategies, the role at the social context in strengthening some of the approaches that we might use and also how we might embed F&V consumption in our messages about multiple risk related behaviors.

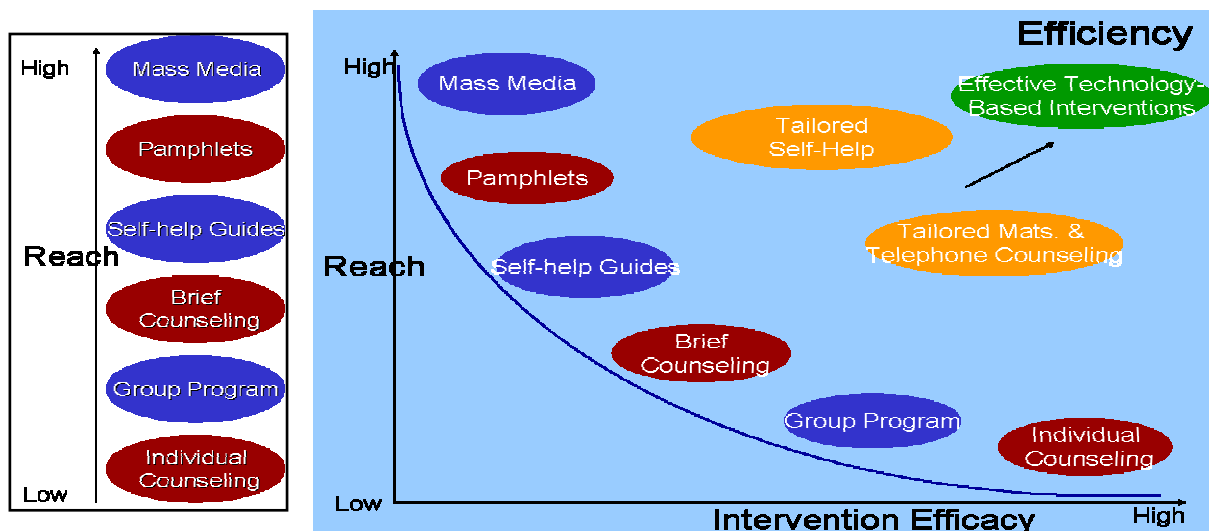
Let's start with the application of a Social Ecological Framework. We might think that some programs specifically target individuals, such as through health education or tailored intervention programs to individuals. Often these are embedded in programs that are built on social support and other types of inter-personal related supports for social change. Finally, within a worksite setting, these approaches are also embedded at the organizational level where we may see for example increased offerings in the cafeteria, where F&V might be made more available and potentially affordable.



We might start by examining programs at the individual and inter-personal levels of influence. Increasing emphasis in the literature is placed on tailored programs particularly designed for individual workers, and aimed making the program particularly relevant to individual worker.



We might think of this along an axis of intervention efficacy that goes along a continuum where most efficacious programs might be individual counselling or group programs whether there is more 1 on 1 potential of a dialogue.

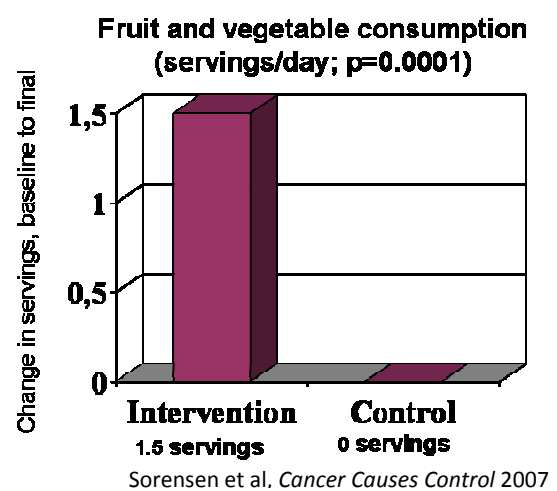


On another axis, we might look at reach, where we might have less efficacy in changing individual behaviour but reach more people, for example through mass

media kinds of appeals. So the question becomes how we actually maximize both efficacy and reach?

One example is through tailored programs that bring the individual focus, for example through counselling, but also brings in some of the mass media approaches through technology driven approaches. We tried this in a couple of settings adding on to that we want to make these kinds of programs relevant to specific groups of workers.

In one program we particularly targeted construction labourers in collaboration with their union, the Labourers InterNational Union of North America. These workers are unskilled to trade persons who work in a variety of different construction capacities usually in a support level. Many of the union's programs focus on health promotion. So, we worked very closely with the unions in developing a program which was tailored to individual workers and delivered by telephone. It included in addition to the telephone counseling, some written materials that were specifically aimed at the risk that individual workers had. We did formative research to inform the intervention design. We used a randomized design to test the effectiveness of this intervention linking messages around F&V consumption with other areas of particular importance to these workers such as tobacco use (the rate of tobacco use of this population is quite high) and also occupational hazards, given that many of these workers have exposures to hazards on the job. We saw a striking increase in consumption of F&V of 1.5 servings/day in the intervention group compared to the control group. Many different disease management companies within the US are beginning to adopt telephone delivered interventions that tailor around some types of programs such as it might be done here.



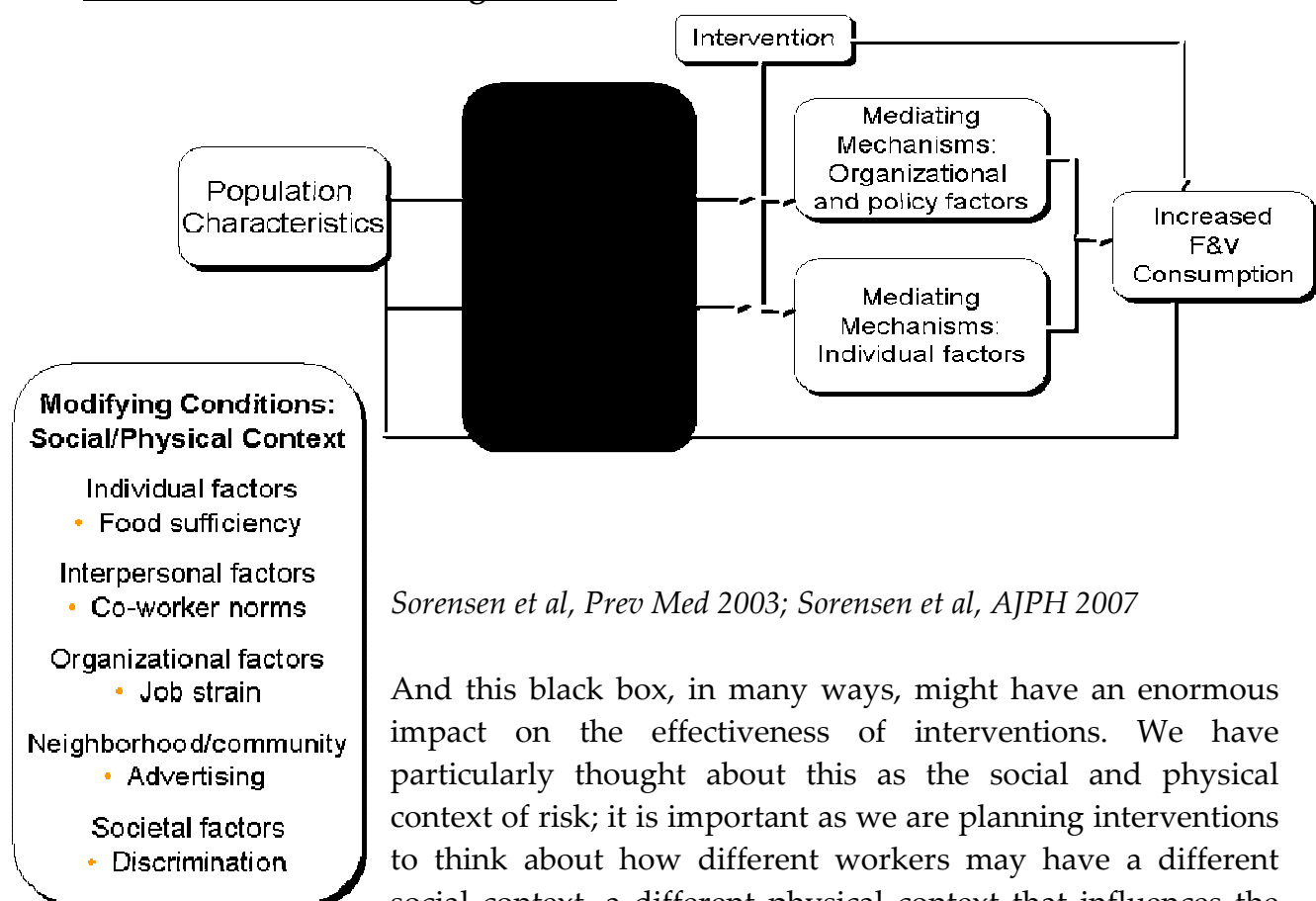
Moving back to the application of a Social Ecological Framework we also see that there is a wider array of studies that are focused on organizational levels - trying to look at how the worksite as a whole can make changes that would be supportive of workers increasing their intake of F&V. There have been some particularly excellent examples of such efforts in some parts of Europe like in Denmark and the Netherlands.

To pull all this together many programs are trying to look across these multiple levels of influence to do a range of activities - including health education programs in combination with increasing information in a broader environment of the work place, along with making changes in cafeterias in this kind of multidimensional capacity. One example of this type of approach was used by the Seattle 5-A-Day Program which actually found a significant increase in consumption of F&V using a

cluster randomized trial that they did a few years back. They also used an employee advisory board that is one strategy for increasing participation of workers in planning and delivering programs. The aim here is to assure that worker's concerns and interests are responded to within the program. Worksite programs often use employee advisory boards, in which different employees across different levels in the workplace might be brought together to plan and help deliver programs. Another approach that is sometimes used, for example in the Arizona 5-A-Day Study, is the use of peer educators - programs delivered by peer workers who can help make sure that those programs are really relevant to the specific needs of the workers in a given setting.

To summarize – we have reviewed the ways that interventions might be delivered both at the policy level or organizational level in the worksite and through individual factors such as through delivering a tailored intervention, and how these programs might increase F&V consumption. We often try to understand the role of a range of different population characteristics: what are the occupations that people are working in? Are they male or female? These population characteristics have clear implications for workers' success in changing their health behaviors. We want to understand the pathways through which these population characteristics operate. We might think about this pathway as a black box through which these populations' characteristics might function, as illustrated in this figure.

The Health Behavior Change Process

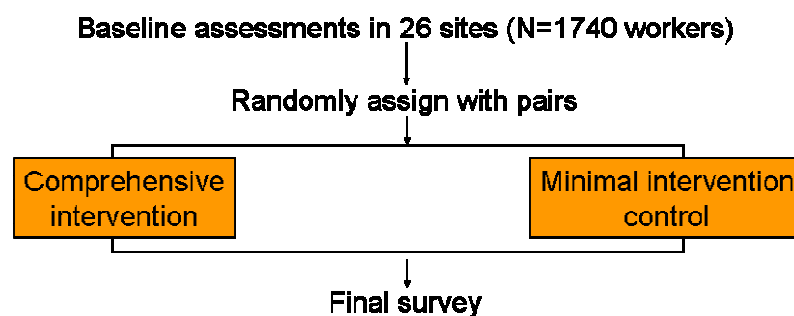


choices that they might make - whether it be F&V consumption or other health behaviours. Potentially the effectiveness of our interventions can be increased when we add into the design some of these issues. I would like to illustrate this with one study that we have conducted in small manufacturing businesses. I hope to give you a sense of how our reviews of the social context contributed to an understanding of the social and physical context, in order to inform interventions design. In addition, we might actually influence some elements of the social context through the interventions.

This was a study done in small businesses and we addressed both the social context as well as multiple health behaviours as I described as being one important element in the beginning. Actually our primary outcomes in addition to F&V consumption were increased physical activity, decreased intake of red meat consumption and increased intake of multivitamins. We also looked at reducing the potential exposures to hazards job, understanding that workers in these particular settings were often particularly exposed to hazards on the job. Many of these were multi-ethnic worksites located in the greater Boston area.

This was a randomised trial in which we recruited 26 sites to participate in the study and they were randomly assigned either to receive this comprehensive intervention addressed at multiple levels of influence, or to a minimal intervention control. In assessing change we were looking at all workers regardless whether they were participating in other health education kinds of activities; all received some type of program through the policy level efforts. We addressed the social context both by their work conditions and experiences.

Research Design



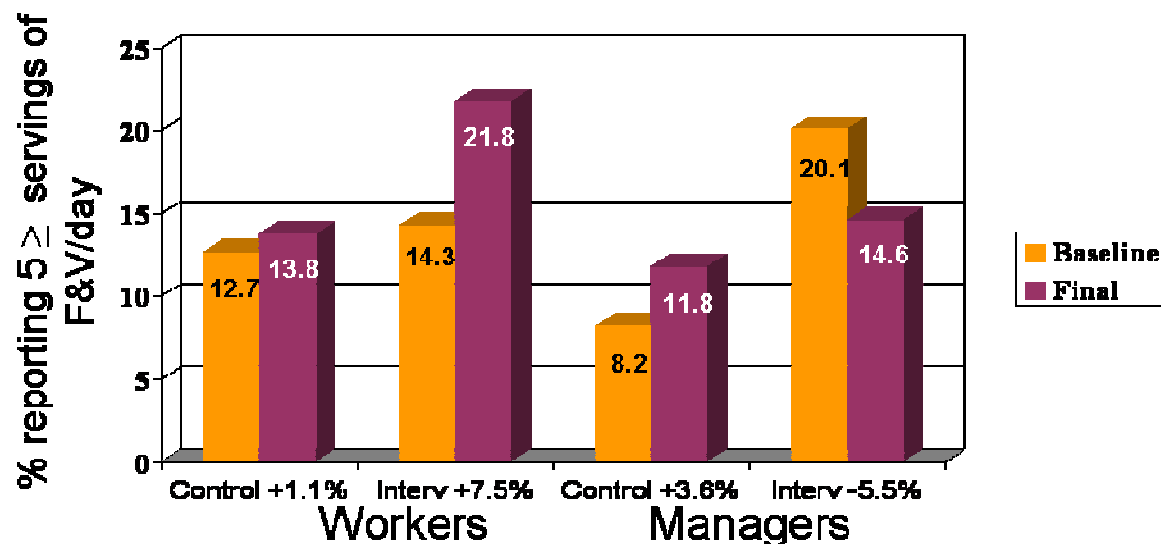
We also aimed to bring in the influence of the co-workers, understanding the influence of social support in making health behaviour changes. We particularly adapted the intervention to cultural issues, because many of the workers in these businesses were immigrants. (We delivered the intervention program in 4 languages, English and 3 others that were particularly relevant to the workers in these businesses). We also wanted within our program to address barriers that might be related to the fact that these were low income workers who did not have necessarily large amounts of money so we wanted to be sure that they understood how they

might be able to make some of these changes with the resources that they had available.

We found overall that there was greater health behavior change in the intervention versus the control. These changes were particularly significant for F&V consumption and multivitamins intake. We saw as we had hoped that the effects were equivalent or stronger for line workers compared to managers. And there were significantly greater improvements in fruit and vegetable when we looked at minority workers compared to the White workers or non-Hispanics.

This figure illustrates how this worked for workers versus managers. We are looking at change in F&V consumption from baseline in yellow to final in red for workers in the control versus the intervention and for managers the same. You can see that we had a significant increase in F&V consumption in the intervention group for workers and this was a significant improvement over the control group. The differences among managers are not statistically significant.

Change in Fruit and Vegetable Use by Occupational Status



Sorensen et al, *Am J Public Health* 2005

In this study we also wanted to look at the social contextual factors included in the model. We examine related increase of F&V consumption with some of those social contextual variables. We found greater increase in F&V consumption were associated with: having sufficient food in the home, having lower levels of crowding in the home, having supportive social norms, stronger social ties, being female, being born outside the US and being a single head of household. Those last two, actually interacted with the intervention such as the intervention was more effective for those born outside the US and for those with single head of household. It was actually part of our hope that this intervention would be particularly effective in addressing some of the disparities that we often time see by SES. We did not see a relationship in terms of the increase of consumption of F&V by any of our socio-demographic variables and we were actually hoping that in many ways this would be a program that could be effective across different groups within the population.

In conclusion I would like to just point out a couple of key points that I think are important overall but also provides some sense of where we might head off from here. First of all, I think from this we see that across a range of evidence both conducted in the US, in Europe and elsewhere that there is a firm evidence base for intervention effectiveness in changing F&V consumption. Our research in the future may want to look at some of the mechanisms and processes of change and how best to target some of those changes to improve the effectiveness of future interventions. We might want to identify linkages across environmental change and educational interventions in order to maximize the level of change that we actually see. We also clearly need ongoing work to address disparities in F&V consumption as well as some other health behaviors - across economic positions and other important indicators of social disparities. The social context for change may provide one means for us to particularly address some of these disparities. Finally, the work I have presented provides a preliminary understanding of some of the best practices that we might be able to apply around worksite interventions to improve diet and in particular F&V consumption. It may soon be time that to turn some of our attention at least to identify some of the facilitators and barriers to dissemination of some of these best practices in order to be sure that they can be applied across many other types of worksite settings.

Q&A

PUBLIC: Did you observed other changes in patterns of behaviors such as increased exercise activity or reduced tobacco use as a result of a greater awareness on F&V consumption?

G SORENSEN: In the study that we did with construction laborers we also saw an increase in quitting smoking. In the other studies that I presented that were done in small businesses, we were not targeting smoking cessation but we did see a significant improvement in multivitamin intake. Along the issue of physical activity what was interesting with this group of workers was that they already have high, very high levels of physical activity to begin with. We are not really sure why but we actually validated those self reported findings through accelerometers used to monitor their physical activity. So, although there was an increase it was not statistically significant.

PUBLIC (Carolina MAYER from the American Cancer Society): I wanted to mention that we had a pilot running out of our national Core center in Texas with John Furest similar to the intervention you have with the construction workers. We finish the 12 months data collections in August but at this point we observed an increase 1.6 of servings of F&V and also some significant weight loss and maintenance. So I am hoping soon we will be able to add it to literature on this issue. We also have some worksite pilots in India.

J MILNER: I noticed that you had 1.6 or 1.3 increase servings but actually where does it started?

G SORENSEN: There is a large range we see but to clarify, as seen in the Seattle 5-a-day study, whenever a worksite study is done our workers are included in the results so whether they got an intensive level of interventions or whether they really just were there and did not experience anything more than maybe the cafeteria changes, there are all included and their changes are aggregated into that final result. So, we see a worksite wide level of maybe around in average of half a serving in those types of studies. The 1.5 difference serving was among workers that were all participating in the telephone delivered intervention so they were all receiving a much more intensive program. We need to think about the intensity.

J MILNER: One of the other issues I have is to a large extent you really talked about the behavior and what does it means for biological outcomes? Has it been some real attempts to look at infection rate, to look at days off even with those kinds of changes in frequency of intake?

G SORENSEN: I think that is an important question and I am not sure. To some extent I think that is a different group of studies that are looking at some of that. Maybe some of our epidemiological studies might be able to have associated F&V consumption in dietary patterns in relation to some of the economic indicators such as absenteeism. But, I do think there are issues that we need to begin to pull in some of our research and we actually have a data set right now when looking at what happens.

Successful strategies for sustaining increased F&V consumption in worksite canteens

Bent Egberg MIKKELSEN

Danish Tech University, Denmark

If we want to seriously influence health and eating habits at worksite, we need to take the settings into account and having the previous sessions on School Fruit Schemes, I believe that we can get useful insights from lessons learnt from other settings such as kindergarden and schools. There are many organisational similarities and insights from one area that should be transferred to other areas. The common thing about settings is that in all cases we have to deal with intermediaries. For instance we want Canteen Managers, Human Ressources Managers, worksite health officials and other relevant people in organisations to take action and convey the healthy message or – in scientific terms – to help deliver the intervention components. In my opinion the insights we get from public health nutrition and from health behavioural theories are not enough since they are not strong on the organisational sociology aspects. That's why we in addition need an organisation theoretical framework if we want to promote health at the worksite. We have good experiences in trying to apply theoretical insights from the Science & Technology Studies (STS) as well as Actor Network Theory (ANT) which are trying to understand and explain how new “technologies” such as “healthy eating at worksite technologies” become shaped not only by health promoters and researchers but also by the users of such technologies, namely the employees at worksite.

With these words in mind I am going to present this paper on Successful strategies for sustaining increased of F&V consumption in worksite canteens. The notion of sustainability of intervention is a key concept here because it is about how we can make sure that the worksite can sustain the intervention after the researchers have left the intervention settings.

The content of my talk is the focus of the study, the concept of sustainability of the intervention, the research design, the intervention in 2000, where five 6 a day worksite canteens were studied during one year and finally including a baseline and a one year follow-up and finally the 5 year follow-up study, which has become the theme for colleague and co-author Anne Vibeke Thorsens thesis. As you noticed I stand in for Anne Vibeke today and promised to send apologies for not being able to make it.

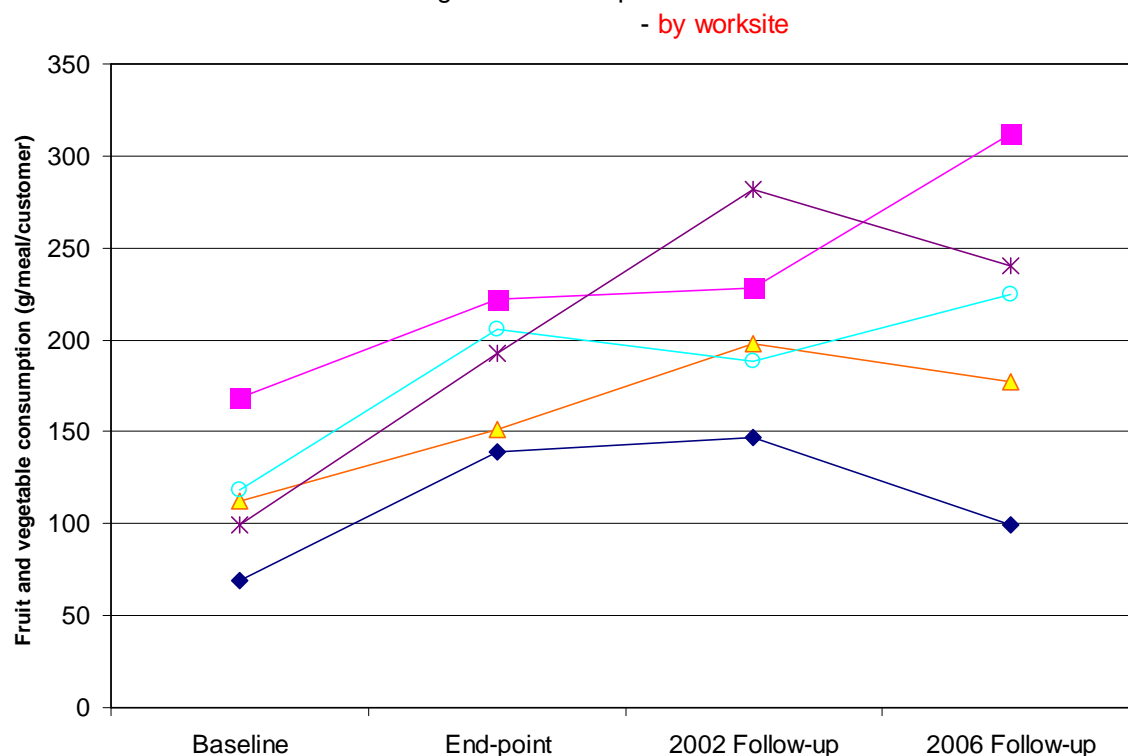
The strategies for embedding F&V in meals in the study where food service strategies for four different areas: hot dishes, cold dishes, salads and snacks. My talk will focus on two selected cases which represent successful as well as less successful cases. Finally I will present some general strategies for embedding F&V in worksite meals.

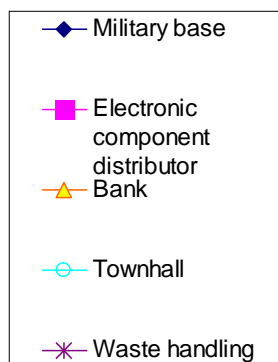
Two key concepts form the point of departure. Firstly the “healthy eating in settings” interventions, what are the advantages? A large number of individuals can be reached including many unlikely to engage in a preventive health behaviors. Secondly in using the notion of sustainability of intervention we draw on the experiences of O’Loughlin which defines the concept at the extent to which a new program or an intervention becomes embedded or integrated into normal operations of the organization. An example might be how we make sure that the F&V strategies becomes embedded into the standard operational procedures of the canteen facility or how new procurement routines becomes adopted.

The 6 a day worksite canteen model study at the beginning of the intervention was 5 motivated canteens. In other words, motivation was an inclusion criteria in order to become a participant of this multiple case study. Then the canteen managers had to be motivated further in order for the intervention to work. One important finding here was that it was discovered at that time, the point of worksite entry was the canteens and the canteen staff therefore, what we found today, is that the worksite agenda has changed so that the entry point now is both the kitchen level and the top level.

The outcome measure used in evaluating the intervention were F&V measured by weight in terms of grams per individual per day of intake at worksite and these figures are presented in the slides. We note “worksitefruit” box schemes are not included, so what we present is data on FV from the canteen only. Since “worksitefruit” is increasing, real intake might be even higher and that is good news.

Total fruit and vegetable consumption over time for 5 Danish canteens 2001-2006





As the figure shows measures were at baseline, intervention one year follow-up and a 5 year follow-up. Significant increase from Baseline to Endpoint can be seen.

This represents the diversity of the material; the pink represents an electronic component manufacturer which is a very successful case. Today they have increased further up to 300 grams per participants per day. Also the municipal town hall has improved after the intervention and after they were left on their own. But, in three cases we saw some decreases in

the efforts made by the worksites and in these cases the intervention were not completely sustained.

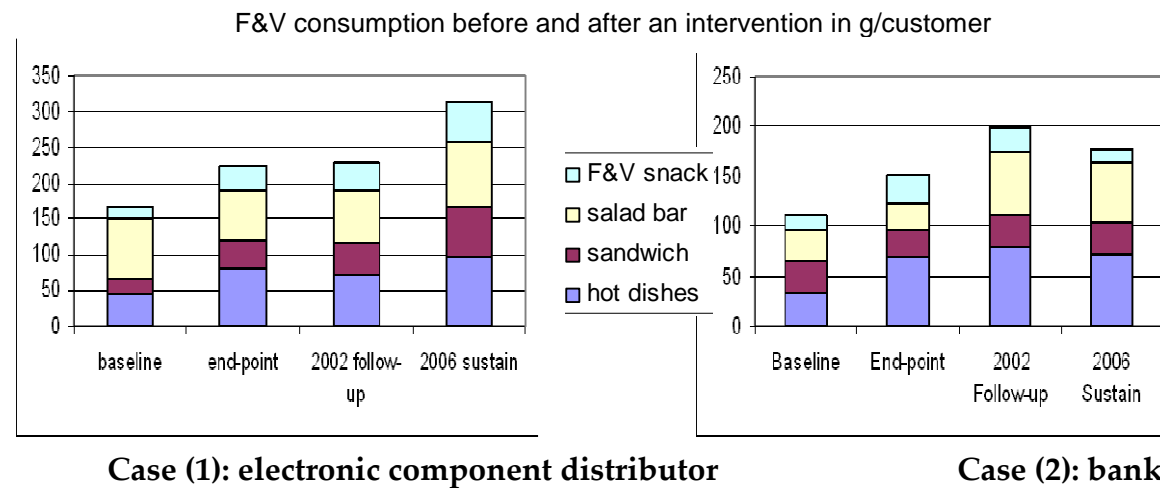
What was the intervention then about? The intervention was developed for the canteen managers to first of all get an overview of what types and amounts of FV they were using – a sort of inventory. In many cases you will find that canteens do not know the amount they are using. Then they were asked a number of questions about their specific goals in other words details about how they were planning to increase FV availability through intervention in hot dishes, cold dishes, the snacks or the salads or a combination. The questions were designed with the concept of PDCA cycle (Plan Do Check Act) in mind. The PDCA cycle illustrates a series of steps consisting of setting goals (Plan), to make an action plan and carry out (Do), to check whether they reach these goals and to correct if not.

In the case of hot dishes meat is being replaced because meat is expensive, and we can profit by using the juice and flavor for dishes, increase the serving sizes of FV, serving vegetarian meals once or twice a week, get inspiration from other ethnic cuisines such as Indian and cuisines that are rich in vegetables.

Regarding the sandwiches, strategies included to use at least 2 different kinds of fruits and vegetables, place fruit and vegetable garnish at the beginning of buffet and free of charge, use the denser garnish, offer plates with a fixed amount of fruit and vegetables.

Regarding the salad bar, it would be of great importance to use different recipes to ensure variation, use more coarse and fibre rich vegetables such as cabbage and root vegetables, serve a more appetizing and substantial mixed salad on the buffet, try to move the salads to different positions on the buffet which is often the way to serve in most canteens. Doing that it is possible to reach some of the traditional non-salad eaters. Regarding F&V snacks, one can sell whole fresh fruit at favorable prices, use the price instrument as a tool in general, sell sliced fruit, give away whole peeled vegetables, make a vegetable snack bar, sell snacks in bags and serve more fruit-based desserts.

5 year sustainability of a worksite canteen intervention



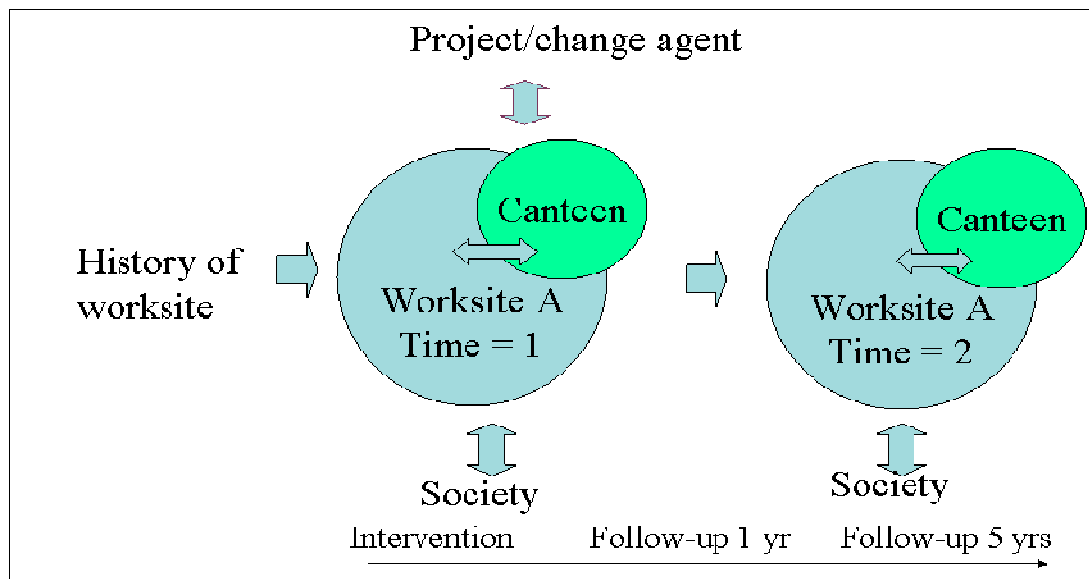
In both cases it is seen that the hot dishes and the salad bar account for most of the increase. In case 1 it was the same personnel and staff at 5 year follow up which is probably the reason why the results were sustained. In case 2 it is seen that salad and hot dishes account for most of the increase in intake.

What we found was that although a high sustainability was found all workplaces changes over time. So far we have been speaking about “in-house” configurations where the canteen is operated by the company itself and where the company controls the food service. In case 2 an outsourcing took place which was a serious challenge because the contractor not necessarily has the same goals as the worksites themselves. Thus nutrition issue risk to loose against financial issues. Our finding suggests that when companies want to change the supply chain there is always a contract to be negotiated. So, there is maybe something to be worked on: what are the challenges when in the case you outsource your catering and outsourced catering is increasing.

For the three of the cases there were also changes in the way that the canteen operated so that is the reason why they were not able to, sustain at the same degree their results 5 years after.

What we did it put these results into a type of model which can explain some of the things that happens.

Sustainability of intervention: Model for planning of intervention and analysis of sustainability



The figure illustrates that we have a worksite at time 1 which then through the intervention changes to time 2. The figure illustrates that there is a flux - a relationship - between the canteen and the worksites, but what is important to underline here is that any worksite has a unique history. This is a story of what has been going on earlier in that particular company with the facility. In relation to promotion of health it is important to know if there is a tradition of cooperation between employers and management previously. The figure also illustrates the impact of the influences coming from society that increasingly expecting the worksite to engage in promotion of healthy eating at worksite. Finally the figure illustrates that impact of a project/change agent that interferes and motivates the worksite to change in a healthier direction. Such agents could be health promoting NGOs, researchers, as ourselves and authorities.

It is also important to involve the top management because it increasingly becomes of strategic concern to relate and care about health and healthy eating at worksites.

In conclusion, I have some recommendations for future interventions. We think a participatory approach is important. We need to involve worksite employees, management, canteens and their management, so it is a multi-stakeholder approach. The awareness of the worksite history is important; we need to know about the culture, norms and values that were in the worksites and history of conflicts of collaborations between employees and management. A dialogue with suppliers is extremely important to be able to set up cooperation with the supply chain. And last but not least, networking among worksites and canteen professionals are an important key factor to be considered because, they feel alone and they need to be involved in the network programmes. The networks can work as an important player in the canteen.

Q&A

J MILNER: I am wondering if these people that made the large evaluation in the canteens, did they follow the methods used in the intervention to change their diet at home. Do you have any information about that?

BE MIKKELSEN: No because our key informants are the canteen managers and what they have been doing is that they picked up a FV data collection method to measure what was offered. We do not have the insights into their individual dietary history. We have not performed any dietary assessment with regards to what the employees at the individual level ate. We do not have any interviews and we do not know what happen at their homes, but I agree that it would have been good information for us.

J MILNER: I think that kind of information is going to be important at a long term. One of the other issues that come to my mind is the cost difference (meat versus F&V). Is that really part of the reasons these occurred with more F&V?

BE MIKKELSEN: We have not any figures to support that theory but in the minds of catering managers that is one way to cut costs and to substitute. I guess that is what we found also in organic procurement interventions which show that is what they do in order to save money by decreasing the meat budget.

PUBLIC: Often at times, I have heard concern rose before a program might actually be delivered or offered about the potential lack of demand. Canteens managers may feel that the workers simply would not buy into this. What it something you had to encounter at all? How did you address that?

BE MIKKELSEN: Yes as one of the slides show at the electronic component distributor worksite a number of employees were not satisfied as they could have been in the way that they would have preferred the traditional dishes with a lot of meat instead and they were not happy with the interventions. We did not address that specifically but left to the canteens managers to take action. The proper way to describe their role is as ambassadors. I mean as inclusion criteria the canteens managers should be committed therefore, we are depending on them more or less to be ambassadors for these changes.

PUBLIC (Woman working in a fruit company called Dole, headquarter for Europe, from France): We have put in place a scheme together with our working group called INTERFEL. We have decided to have fruit delivered in our offices every Monday and that has been going on for two years. In the beginning it did not attract much attention from the people although, there were literally boxes of bananas, pineapples and peers depending on the seasonality. I can guarantee that on Monday's when the

fruits arrives, the personals are interested in consuming them. If they were not interested at first, by Thursday everything is gone. Furthermore, the personals also give positive feedbacks and information's if they lack some of the fruits. Therefore, we are creating models for them, we are an incentive for them and they can disseminate this information. This is an example for our company where, we are 60 employees; I can guarantee that every individual eats fruits in our company.

BE MIKKELSEN: I believe that is a really good example of what we found in many cases at worksite, namely that fruit box schemes canteen food supply seems to work separately. In the case of Danish schools, we see 3 different trucks coming to the school, one with the food, the other with the fruits and the last truck with the milk. That is a challenge. I believe that these supply chains could be coordinated much better also at worksite and so perhaps making the supply chain work more smoothly would be a challenge to address.

J MILNER: In the Cancer Institute, our canteens are overcharged with F&V like mad. They're left there and nobody buys them. I can understand these are real issues. Cost is really important in driving this and freshness of these F&V.

PUBLIC (J ATKINS from Australia): Often when one discusses about making changes in canteens whether, it is in the worksites or school canteens, profitability becomes a big issue. Did you find any issues with what you did in the 5 companies? Whether they observed the fact that creating a healthier menu was going to fit into the profits?

BE MIKKELSEN: We did not measure or ask questions about the sales. What they did was they had some active price and policies in order to support healthier items, but I am sure if decrease sales had been a problem, they would have changed.

Improving Health at the workplace: where can F&V fit into the equation?

Benjamin SAHLER

ARACT Limousin, Limoges, France

I am afraid I am not a specialist about F&V, I am not a specialist about nutrition either, I am just working for ANACT that means French National Agency for Improving the Working Conditions and I prepared this presentation with Corinne Delamaire from INPES (French National Institute for Prevention and Education for Health).

Just to say one word about ANACT, we are very special kind of public consultant sharing participatory approach. Our tri part boards consist in the labour ministry and also the trade unions and employers organisations. So, every kind of interventions we lead on the different job area issues research that balance between both interests.

I am a bit afraid as I heard the former speakers that we, the French people, are a bit late on those issues on the work place and I shall explain why. The Health program on the worksites lies under the responsibility of employers; the employer responsibility is the leading principle of labour regulation law. This is a fruit of a very long social history and it is considered as a very essential social benefit for the social partners. That leads to a quite absolute priority to the OSH (Occupational and Safety Health) approach to the work-related risk assessment and prevention. That is why the idea itself of health promotion is a bit late and neglected. The social partners used to consider that they fear if they push on the health promotion idea that the employer will withdraw his own responsibility.

It is also very difficult in France to address the individual freedom. People want to eat what they want; they do not want to be addressed on that kind of topic. Even my colleagues are sometimes very reluctant for me to talk about this issue at this conference! There is also a lack of interest for the collective support on those issues. And at last, the two topics are lead by two different ministries, on one side for us the Labour Ministry and for the health promotion the Health Ministry and maybe you know that sometimes it is a bit difficult to work together very efficiently.

When we look around, as I do in participating in European projects and sometimes going overseas, I fear that we have unfavourable international comparisons. For instance, I participate to the ENWHP (European Network for Workplace in Health Promotion) that is leading right now a project called Move Europe where there are 4 issues with auto questionnaires to companies on tobacco, physical training, stress prevention and nutrition. The bad news for us is that France is lagging behind. It is very difficult for us to join those kinds of projects. Nutrition is very often a missing issue among workplace topics. The only addressed issue by occupational practitioners is the nutrition issue when you have irregular work times, as people working by night for example. The medicine will be aware on how they get the food, what kind of food they get and so on.

Nevertheless we all are convinced that the links between lifestyles, including nutrition habits, working conditions and ill-health are clear. We consider in our daily practice how important are the unbalances concerning work rhythms, break times that are available or not, the food itself (how much food they take, what quality of food, too much or too little), as well as physical training, as some people do too much with repetitive movements and some do too less staying always at the same place and never moving.

Nutrition, a missing issue among workplace topics

- The only addressed issue by occupational practitioners : nutrition within irregular work times
- Nevertheless links are clear between lifestyles, working conditions and ill-health...
- Obvious unbalances concerning work rhythms, break times, food (quantity-too much, to little, or bad quality) as well as for physical training (fatigue with repetitive movements or sedentary work)



B. Sahler and C. Delamaire
F & V summit - 29/05/08



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The good news is that the times are changing: the silo-box thinking is just opening. We work a lot about psycho-social risks prevention and the issue of work-life balance is coming up and up. And I repeat it was not so common in France in the last few years. Individuals also are more and more concerned with their own health so they come to address the work place. As someone said earlier here, the workplace is one place where we spend a lot of time each day. We tend to see workplace health in a broader way and the promotion idea is improving. Managers and the occupational practitioners become aware that people need to manage their own health. We have many public surveys and media campaigns putting up the message. Now we also have examples of other new healthy behaviours about tobacco with the recent law in France, with also the road traffic risks and also the question of obesity. We come more and more aware of those topics so the promotion idea is coming up. From the employer point of view, the ideas of Corporate Social Responsibility or Sustainable Development are new concepts that are more and more common. You see that the idea itself of health promotion is getting more and more present.

I will finish with a few first examples concerning F&V at the workplace. Those examples come from Corinne Delamaire. You know about the current French F&V consumption which is insufficient and I think they are lower than the medium figures you get in different countries.

The current French F&V consumption

- It is insufficient !
 - Only 43% adults eat at least 5 F F&V per day (35% low consumers) ;
 - 20% kids eat at least 5 F F&V per day (44% low consumers)

Source : *Etude nationale nutrition-santé, InVS, 2007*



B. Sahler and C. Delamaire
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You also know the breaks we described about consumption, the price, the taste, and the home habits that are not developed either, the practical side on the work place and the perishable side and how to find them when you are in the workplace. But, how can we encourage F&V consumption, even on the workplace? We have a very interesting example of services offered to companies directly delivered by producers to the companies. As an example 'Verger de Gally' which delivers fruit baskets for use by workers on their jobsite concerns now about 2000 companies. Also, now the vending machines are not only delivering chocolate bars but also compotes, fresh fruit as for example 'la Machine Verte'. And also, nutrition information and education programs led by companies as for example in a hospital in Brittany, Brest Hospital, concerning physical training where they are more than 6'000 employees having this program since 2004. Another program, named "Equilibre", which is lead by a workplace collective catering company (Sodexo) where they developed canteens they had in the different big companies.

Nutrition Programmes on the worksite

- "Equilibre" (= balance) Programme
 - By a workplace collective catering company (Sodexo)
 - 5 modules: information campaign / 1 balanced meal a day / dietician advices / cooking workshops / coaching
 - French national Label PNNS (3 modules/5)
- Santal ("Santé Alimentaire" = healthy food)
 - PSA Peugeot-Citroën in Rennes
 - since 2002 concerning 11.500 employees
 - Information campaigns / coaching
- And others: Bayer France, Axa, Total, Nestlé...



B. Sahler and C. Delamaire
F & V summit - 29/05/08



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They had 5 modules with information campaign, one balanced meal a day, dietician advices, cooking workshops, coaching and they get the label PNNS. So, it comes to be a common idea. And the last example is "Santal" ("Santé Alimentaire" that means healthy food) for the big companies. You will understand that we are lacking of examples concerning this subject in the SMEs.

Q&A

PUBLIC (Mariano WINOGRAD from Argentina): You put the accent on food at worksites but I would ask about the food in work times. Some people are working in a big company but don't have the meals in the companies but are going for lunch outside the company. In Argentina they do, major lunch tickets companies are French, one is Sodexo and the other is Accor. Who would be a role for them as alliance in this matter? Which can be the role of the tickets which the workers use to pay lunch outside the enterprise to promote more F&V?

I imagine that if there would be a health menu in the restaurants with some promotions to be paid with tickets, then these big tickets companies can be our allied. In Venezuela, for example, all the workers receive part of their salary in tickets to have lunch in the day. In Argentina we have now certain problems on that matter but I would like your opinion about it. I imagine if we will be creative we can find something important there, all these people which are working in a city, working in big companies but having lunch outside the worksite.

B SAHLER: As you understood we are really at the back in the classroom but I think the first step is to begin with the employers' responsibility on the worksite in their canteens but your question of course is very important. Many people have their

lunch outside, how to promote with the ticket system also more balanced menus including F&V, we must be creative? Have you got an idea?

PUBLIC (Mariano WINOGRAD from Argentina): I heard about A Gustino project that was developed by Accor.

B SAHLER: We have been contacted by Accor, they are beginning, they try to begin a European project on that topic founded by the European commission. They presented a project but we do not know yet whether it would be accepted or not.

PUBLIC (Ambroise MARTIN, Accor): Effectively there is something that is currently being done in France for the moment, also in Spain, in Belgium, in Hungary and it is expected that this could concern also extra European countries. But, you must be aware that it is a difficult task because restaurants are frequently very small enterprise, very fragmented market and it is difficult to motivate these people to have additional work. For the moment in France for example about 100'000 restaurants have been motivated to participate. One of the reasons also is that it is not only something for the labelling of the restaurant but something which is effective for improving the quality of the food offer.

B SAHLER: So perhaps in Argentina next year...

PUBLIC (Albert HIRSCH, Ligue National Contre le Cancer): Je voudrais porter à l'attention de l'auditoire que la récente législation française concernant l'interdiction de fumer dans les lieux publics et notamment dans les cafés, hôtels, restaurants que vous avez pu constater être appliquée a été obtenue pour des motifs exclusivement juridiques. A savoir qu'un arrêté de juin 2005 de la cour de cassation oblige l'employeur à une obligation de résultats et non plus une obligation de moyens. Pensez vous que ce contexte juridique qui ne va pouvoir que ce développer va être tôt ou tard, et si c'est tôt il vaut mieux prendre les devants, si c'est tard on verra, applicable au domaine d'une alimentation saine dans le milieu du travail qui comme vous l'avez rappelé dépend du Ministère du Travail et du Ministère de la Santé.

B SAHLER: I do not know. I know that the constraint by law is very efficient. But, I think for that issue especially we are also under cultural habits that have to change. I took the example; I agree with you that for smoking habits and also for the driving habits the law change really the things. But I am not really sure that our country is ready to have a law about F&V. Do you think so?

PUBLIC (Albert HIRSCH, Ligue National Contre le Cancer): We are going to do what we have to do that means lobbying, information, education, actions in the social society and I think that the example of tobacco can be used in order to reduce the time between knowledge and the action taken in the public place.

B SAHLER: I totally agree. I am personally convinced of the interest of F&V consumption.

J MILNER: Just a quick comment, we stated out this meeting talking about risk of cancer at least as one of the variable and this is the doll and pito information that suggested that tobacco was associated with about 35% of cancers and dietary habits. It sounds to me that we have good ammunition today as we do with tobacco.

DEBATE

PUBLIC (Elisabeth PIVONKA, Produce for Better Health Foundation in the US):

Just a question for anybody on the panel. I actually did hear Vanessa that you were encouraging folks to reduce the meat and increase the vegetables or somebody said that to keep the costs down which from our research and our work with restaurant chains we are finding that it is the case that they can reduce meat, increase F&V and its good for costs. But what about the idea of since you do hear some workers complaining that they miss their French fries or some of the other food that they typically like, what about raising the costs on the food that are not so good for you and basically that would subsidies the costs of the healthier food. I have heard that it had worked in some worksites. Have you done any work on that?

BE MIKKELSEN: I am not aware of any work done in that field. I think that is very interesting. I do not find it unethically but I simply do not know about studies that had demonstrated the effect of that. I think that it could be wonderful to study if it has an effect but I am not aware of any studies.

J MILNER: I think you have to realise that most of us go to a place to eat because we like the food and because of the price. So if I do not have the food I like and high prices, then you decide to not go there. So those are the issues and we are all pretty much the same regardless of what country we are living.

PUBLIC (Elisabeth PIVONKA, US): Actually a comment to that, if you think that at least in the US, consumers who are not good drivers and have lot of accidents recognised that they have to pay high car insurance. So if they recognise that these are foods that they should not be eating so much of then maybe if they have more healthy behaviour they should not pay more health care costs.

J MILNER: I think it is actually a lot cheaper to buy some of these items than the F&V because they are so expensive, at least in the US.

PUBLIC (Adam DREWNOWSKI, University of Washington): John is right, if the food is more expensive and you do not like eat you are not going to eat it country regardless. I have a question about the implication of working in worksite that is: what are the policies of working with worksites who have Unions and those who do

not? And in the US between those who have health care and those who do not? Do you have equal success in both or do you encourage worksites unionized? What do you do?

B SAHLER: As I see in France, the unions do not consider this as an interesting issue.

G SORENSEN: In the US, I think we may make a mistake to think that all unions are the same. Within our research we have done work with quite a few unions that are very supportive of trying to encourage their workers to adopt healthy behaviours and to look at those behaviors from a broader health perspective, to underline that the work environment overall needs to be considered. We need to be looking at how health behaviours and occupational health and safety might not be on opposite sides but might be brought together under a union framework or other sort of framework to understand that the aim here is to promote workers' health in a broad array of approaches. I think that in the US there are some clear differences compared to Europe. My experience has clearly been that there are a wide range of opinions within unions, we have presented some data from our collaboration with labours international unions in America. We are right now involved in another study. There are other unions that might not be as opened to some of these concerns.

PUBLIC (Michel CHAUVET): Vous avez mentionné la liberté individuelle et cela me paraît quelque chose d'essentiel puisque j'ai toujours souffert du système des cantines personnellement parce que c'est un système captif. Bien souvent, quand on est dans une entreprise ou un campus on n'a guère de possibilité d'aller ailleurs. Maintenant par ailleurs, de plus en plus les entreprises doivent passer par des appels d'offres qui privilégient de façon tout à fait excessive les grandes sociétés nationales voire internationales au dépend de petites sociétés locales. Par ailleurs, il y a un système dont j'estime qu'il pousse toujours à la baisse qui est le système du prix unique à savoir que quelque soit les aliments que l'on prend, de toute façon on paiera le même prix ce qui pousse le prestataire de service évidemment à rogner sur tout ce qu'il peut, alors que dans certaines cantines, si on a le choix de pouvoir payer un petit peu plus des aliments que l'on préfère, cela redonne de la place à la liberté individuelle et éventuellement si on le souhaite d'avoir une alimentation plus équilibrée comme on le veut. Cela je pense est le résultat de toute une période où en fait le système des cantines était un peu cogéré entre patronat et dans le cadre commission cantine où on a surtout des représentants des syndicats et le monde syndicale français jusqu'à maintenant a été surtout sensible à imposer au patron d'avoir les prix les moins chers possibles pour la cantine (et un certains nombre de choses) mais probablement pas d'une part les aspects nutritionnels et d'autre part un aspect auquel je tiens beaucoup qui est le goût et la diversité de la nourriture. L'orateur précédent avait parlé à mon avis à très juste titre de l'intérêt de plats venants des cuisines ethniques. Il est vrai que si on mange une soupe vietnamienne ou chinoise, c'est tout à fait équilibré, on a la satiété et on se fait plaisir, de même pour les cuisines italiennes ou autres parce que c'est vrai qu'il y a une certaine façon

de cuisiner les légumes à la française qui ne passe pas très bien dans le système des cantines.

B SAHLER: I also like the individual freedom, and have bad souvenir as well from school canteens but it does not mean that if you go in the city to have meal that you will find the diversity and the quality you like. It is very difficult and sometimes the canteens, especially in the big companies have very diverse food quality so you may not generalise canteens are bad and you find the diversity outside.

SESSION 18

REPORT FROM THE PARALLEL SESSIONS OF THE DAY

Chair: **E Brunner**

- Introduction. **E Brunner**
- Report from Session 11. **C Rowley**
- Report from Session 12. **P Gurviev**
- Report from Session 13. **M Dunier Thoman**
- Report from Session 15. **A Drewnowski**
- Report from Session 16. **K Glanz**

Introduction

Eric BRUNNER

UCL Department of Epidemiology & Public Health, UK

We are going to have 6 reports back from the Thursday May the 9th and the first presentation is by the group that was shared by Carmen Perez Rodrigo effective interventions studies targeting children and this report will be given by Chris Rowley from Australia.

Report from Session 11

Chris ROWLEY

Horticulture Australia, Australia

From the interventions targeted there is one slide from each of the speaker and key points in their summary. Carmen Perez Rodrigo's main points about interventions studies targeting children are evidence of Socio Economic Factors such as age and gender that affect consumption. Family and school environment are important to children particularly for access and availability and this is also positive influence awareness, attitude and preferences help self efficacy.

Karen Lock made effectiveness of School F&V schemes making the point that they are increasing intake from 0.3 to 0.9 servings. School F&V availability is important. She made the key point that multiple components are more effective when you bring together two program elements and also the levels of education are important.

Paula Dudley and the school programs, by 2009 the aims is 102,000 pieces of F&V per day, something like 3.5 millions pieces a year. What is done in NZ is increased awareness, changed behaviour, awareness targeted schools with a very high awareness of their 5-a-day message for 95% which we can all envy. This is all positive public/private partnerships between government industries so it has got that spin off benefit from what they do in schools. Some of the other effects that they gain from the program are improved dental health, improved concentration, more fruits coming at lunch boxes from children that were involved in the Campaign. And the last one is my favourite, greater use of toilet paper so more fibre.

Saskia te Velde talked about the Pro children study. Again research across nine EU countries school by interventions to increase F&V, implement and evaluate in three countries goal to increase consumption by 20%. Approach to implementation affected outcomes so, how they manage to do it in different countries. And free fruit increased consumption in the short term in all studies.

Elling Bere did the Norwegian Intervention and its key points are free school fruit is more effective than the existing subscription program. Obviously the free school fruit shows long-term effects, decrease consumption of unhealthy snacks which is quite important and also tend to reduce social inequalities. Main interesting point of that is the cost benefit analysis that they did where he said that free fruit in all Norwegian schools is cost effective in terms of life long F&V intake and looking at an increase of 2.5g as a goal and I think they actually achieved higher than that.

As an overall summary, school interventions work. They change behavior, increase awareness and knowledge and build positive public / private partnerships. We all talked about the network partnerships, the school program surely does that. To be effective they need to be comprehensive, strategic, incorporate numerous different strategies and components together so no one is thinking it in private.

Report from Session 12

Orateur

It is my privilege to report back on Session 12 which is local initiatives, promote F&V consumption at school. This was a session dominated by French politics, chaired by Jacques Rémy, secretary of the Foreigners Affairs Commission and also president of the F&V studies group. For those of you who are not aware of this politics in France, there are very large working groups both in the two chambers of the French national assembly and understandably because of the importance of small scale agriculture in France, F&V consumption obviously in the rural areas is a major political issue. The workshop recognises that F&V and of course the related activities of wine producing is really crucial for the 'terroir', for the identity, for the economy as well as the health of France and its components and its totality. There were a lot of discussions about how to promote F&V consumption at school and the complexity of the French system is such that the primary schools are at the lowest level of the local government system, the secondary school up to age 15 are dealt by the 'département' and high schools by the regions. So, clearly there is much work to be done but what I was told yesterday evening was that there was a very positive issue experience and the future in terms of establishing the provision of F&V in school is likely to be successful if the momentum continues.

Report from Session 13

Muriel DUNIER-THOMAN

European Food Safety Authority, Italy

We had four speakers. The first ones B. Declercq and A. Périquet presented both of them the evaluation of consumer exposure to pesticides on the French case. B. Declercq is an expert in France of AFSA, the French authority in charge of pesticides; he also an expert for FAO and GMPR, WHO and Professor A. Périquet is also famous in the field of pesticides in France in the University Paul Sabatier in Toulouse. Both of them had a really clear message when they showed us some data and some surveys. Especially professor A. Périquet was in charge of this professional survey where they studied for years many active substances, 122 of them and the survey showed that the increase of consumption of F&V which is recommended to prevent human pathologies such as cancer, obesity, diabetes, CVD or osteoporosis does an increase risk for consumer regarding the pesticide intake. So both of them wanted to give this strong message that despite of what is sometimes written in the news, in the press that eat more F&V is good for your health but that on the other hand it could increase a toxic effect due to pesticide proved us with figures that is not true. The possible exceedance of the regulation that we call MRL (Maximum Residue Level) was really exceeding on 6% cases and in very extreme case of people eating 800 grams of F&V per day which a very high amount. So the figures, when you do a very strict survey on the population consumer shows that there are no toxic risks due to pesticide when you have a high consumption of F&V. The third orator was L. Martin-Plaza working for Commission called E3 and is in charge of regulation of pesticides so he details quite exhaustively all the legislations in place. You may know that the main legislation for pesticides is the directive D/01414 which is now under revision and under discussion on the European Council and Parliament. We expect a co decision by the end of the year so there will be strong improvement in the regulation of pesticide and there is also a systematic strategic on sustainable use of use with the aim of protect the environment and health. There are legislative tools, legal tools in place very strict, very strong to protect consumer and locally and that is what F. Gérault from le GREF where there is an exceedance there is control and the fraud ministry could even destroy the crops. So there are very strict controls on agriculture at the farm level to check if the levels given by the legislation are not exceeded. A very strong legislation exists at European level; control exists in each member states in Europe, especially in France but also in other European countries so the consumers should not be afraid of consuming F&V because of all these controls because of very serious network of control and protection for consumer.

Report from Session 15

Adam DREWNOWSKI

School of Public Health and Community Medicine, USA

The session dealt with the issue of nutrient profiling, for those who the concept is new, let me rephrase the definition that nutrient profiling is described as the science of ranking or classifying individual food based under nutrient composition. Nutrient profiling has two separate uses. In the EU research on nutrient profiling is driven by the legislation on nutrition and health claims. Only food with favourable nutrient profiles would be allowed such claims, food with unfavourable profiles would be disqualified. IN the US Health and Nutrition Claims has been allowed for some time. So, in the US nutrient profiling is being used to identify nutrient rich foods for the consumer so we view it a way of implementing dietary guidelines. The food guide pyramid tries to instruct or inform the consumer on which are the most nutrient rich food. During the session, M. Rayner from the British Heart Foundation and the architect of the British FSA on nutrient profiling scheme presented an outline of technique and strategies used for nutrient profiling. J.-L. Volatier presented ways of validating nutrient profiles linked from the European Food Safety Authority outlined the European position on nutrient profiling. And I talked about the American scheme in nutrient rich fruit scheme which share some of the components of the British and French systems. The consumer response was summarised by C. Pernin and the issue here is the role played between the regulatory agencies, the consumer needs and the need of the regulatory agencies. The major concept to insist on is that nutrient profiling is one of the tools in a tool box and nutrient profiling will only be useful to the consumer if it is firmly anchored within a broader system of food preferences, food habits and the food that consumers select in not only the nutritious but also have to be enjoyable and affordable. Within a broader concept of food choice, nutrient profiling can be a valuable tool. I should also say that V&F, particularly fresh come out extremely well no matter which nutrient profiling scheme you use whether the scheme is American or French or British, V&F are right at the top.

Report from Session 16

Karen GLANZ

Rollins School of Public Health, USA

We had four speakers that were Karen Glanz (USA), Guttorm Rebnes (Norway), Robert Pederson (Denmark) and Gitte Laub Hansen (Denmark). Our session focused on dissemination of programs, try to get actively programs out and how the process function and it is not always on a straight line. I gave an overview when talking about Research Lifecycle and how some of the fundamental research fit into the intervention research. The example that we saw denies ... in a straight line. There was an encouragement to design programs for dissemination or take interventions that had been research based and put them into tool kit so they can be disseminated encouraging our academics to give their work away and distribute the fruit of their labors. We had 3 programs example that showed ways to make easy programs, communicate them and evaluate them. The first was MORE MATTERS from Norway that Guttorm Rebnes from the Norwegian Fruit and Vegetable Marketing Board talked about it a large-scale awareness campaign that targets children and teenagers. Its main objective is to increase the availability of appetizing, ready-to-eat fruit and vegetables at sporting events and sports facilities. They focused on how they get the F&V out in appetizing, appealing and hygienic manner and increase kid's intake. The program really focuses on spreading out to sport clubs so that they take over the program and also make a profit out of it and it is branded as MER. The reach of the program is remarkable considering Norway is a very small country. Moving to Denmark Robert Pederson talked about the Successful national expansion of the Danish Worksite Fruit Program. This is a program that empathizes free and easy access at work during the day and throughout the workday. The results showed an increase of 0.7 servings of fruits and among men a decrease in the high fat high sugar goodies.

SESSION 19

F &V CONSUMPTION IN DISADVANTAGED POPULATION

Chair: **E Brunner**

- Obesity and social class in developed nations. **A Drewnowski**
- Social determinants of health inequalities. **E Brunner**
- How to lower inequalities? **Ph James**

Obesity and social class in developed nations

Adam DREWNOWSKI

School of Public Health and Community Medicine, University of Washington, Seattle, USA

My presentation has to do with obesity and social class. I will start by asking the most difficult and the most provocative question: whether or not obesity is a class issue? Can we reduce obesity without tackling the underlying issue of poverty and limited resources at the household and population level?

I want to set up this dichotomy between the situation in the European Union and the United States because the interpretation of epidemiologic or scientific data is sometimes subject to ideology. The current consensus is that:

Research consensus	US	EU
Obesity rates vary by SES	no	yes
Obesity trends vary by SES	no	yes
SES determines diet quality	yes	yes
Healthier diets cost more	no	yes
Healthier foods cost more	no	yes

In the EU, it is generally accepted that obesity rates do vary by socioeconomic status (SES); a European Commission report on this topic will shortly come out. In the EU, we do agree in the EU that obesity trends vary by SES, we know that SES determines diet quality, we accept that healthier diets can cost more and do cost more, and that healthier foods with higher nutrient content generally cost more than do empty calories.

In the US, there is no agreement on any of those things. Survey data from the Centers for Disease Control (CDC) are often used to demonstrate that there are no differences in obesity rates by social class. As a result we generally focus on race and ethnicity. It is hotly denied that healthier diet costs more; hence the emphasis on individual choice and personal responsibility. And as a result, the interventions to stem the obesity epidemic are very different. In the EU, the intervention focus is on potential government actions and policy based interventions. By contrast, in the US, the focus is still on individual education, individual motivation, personal responsibility and individual choice. So we have this distinction between individual and society, and personal responsibility versus government actions. How do we try to reduce disparities in obesity rates and at the same time address the underlying question of social inequities?

Let us take a look on some of the data that are being quoted in support of and against those particular view points. In the US most of the data on SES and obesity come from the Behavioural Risk Factor Surveys Study (BFRSS) which is a telephone survey

administered every year by CDC (Centre for Disease Control) to 2000 households in each of the 50 states. Those famous maps of US showing obesity rates rising by states are based on BRFSS data, a yearly telephone survey. But the CDC interpretation of those data has been that there are no major differences among states. One statement was that many states were almost identical in their obesity rates so that ranking them was essentially worthless from a statistical perspective. In fact, in nutritional sciences, we are discouraged in many ways from looking too deeply into the underlying social disparities or into poverty rates.

The BRFSS data at the individual level, analyzed by education and incomes, showed that obesity rates declined as a function of income and as a function of education. This relation was much stronger for women than for men. So again, the interpretation of those data in the US was that yes, there may be a gradient for women, but there is really no SES gradient for men. I submit to you the gradient really quite strong and it follows both education and income quite reliably.

Another question is whether there are differences in time trends by SES? Are only the poor getting obese or is obesity increasing in all strata of society? Again, BRFSS data are said to show that there are no social disparities in obesity trends. Analyses of BRFSS data from many years were conducted by Roland Sturm at the Rand Corporation at Santa Monica. The top panel shows obesity rates by education, the bottom panel shows obesity rates stratified by incomes. Notice that the curves were in fact exactly parallel, indicating that obesity rates were increasing equally in all strata of US society. In fact, the data were interpreted to show that the increase was greater among the more affluent because they started from a lower baseline so proportionally the increase was higher among the higher socio-economic groups. As a result, not having found any differences by education or income, researchers generally come to explanations based on culture, ethnicity and race. And yes, there were also substantial differences in obesity rates by ethnicity and race. What you see here are data showing that the rates of obesity in the US do follow this gradation by race. Of course, I suspect there is confound by SES.

A recent paper in JAMA showed a levelling-off in obesity rates among children in the US. Over the previous two decades, we had seen a very sharp increase in obesity rates among children and adolescents. However, more recent data for 2003 to 2006 showed no further increase between 2003 and 2004/2006 so the last two bars are in fact of the exact same height, there was no further increase beyond year 2003. This was interpreted as a very positive sign showing that the obesity epidemic in the US is in fact reaching a plateau. Of course when you go back to the JAMA paper, the data were only stratified by race/ethnicity, the researchers never mentioned SES. It is therefore still unclear whether or not obesity rates are still increasing among children and adolescents who are poor.

A look at another set of data, from studies conducted by the University of Michigan among adolescents in grade 10 shows that there was an increase in obesity rates with

time by race/ethnicity. But what you can see here is a very sharp SES gradient in obesity rates, with highest rates observed among lower income children and the sharpest increase with time observed again among the lower income groups. There are data for boys and separate data for girls. Notice that African American girls and Hispanic girls were the most overweight group and that the SES gradient was both fairly steep and became more pronounced with time. For example the high SES girls did not become obese, the obesity rates were lowest and the increase was less sharp. The trends were more pronounced for the middle SES and low SES groups.

So there is very likely an interaction by race ethnicity and SES, we can discount the possibility that the obesity rates are still increasing selectively and preferentially among the poor. In order to be able to pick up some of these SES differences you have to go to other means of analysis, including spatial epidemiology and spatial informatics.

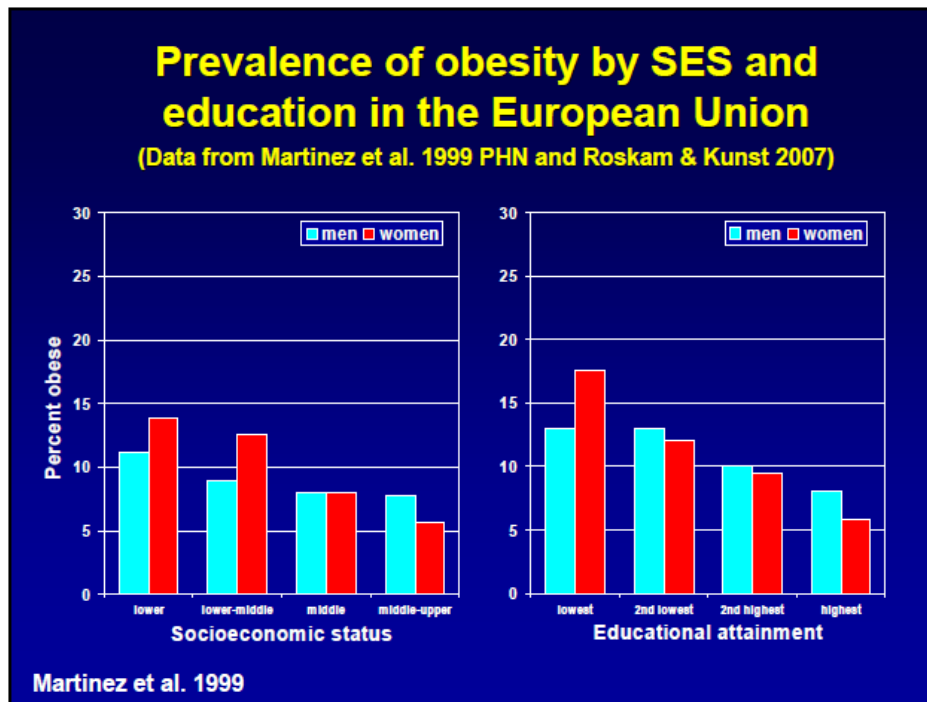
Spatial analyses of neighbourhoods of residence can be very revealing of SES. If you know where someone lives in Paris - if they live in the 20th or on avenue Montaigne, you do not even need to ask about SES, the address tells you everything. "c'est déjà tout dire". At the University of Washington, we have been doing similar geographic analyses at different levels of geographic scale. In spatial analyses, scale is everything.

When you look at the US data on obesity rates at state-by-state level, there is a connection between obesity, poverty and incomes but the connection is weak. In places like New-York State you have the rich, you have the poor. Average obesity rates at state level mix up the rich and the poor and you get a fairly meaningless overall obesity rate for the entire New York State. So, the connection between obesity and incomes or obesity and poverty is fairly weak at state level. The differences become much more apparent at finer levels of resolution and across smaller geographic areas. For example, there are maps of poverty for political districts in California, drawn according to legislative boundaries. You can see that the highest poverty levels are in the Central Valley, with the high proportion of migrant agricultural workers, and in Central Los Angeles, again with high levels of migrant populations. What is interesting is that the maps of poverty areas and the maps of high obesity and diabetes prevalence are almost exactly the same. Those are the same areas. The poorest areas suffer disproportionately from obesity and diabetes and the geographic distribution of disease parallels area SES in both cases. Childhood obesity rates, and interestingly enough the rates of childhood dental caries follow exactly the same map.

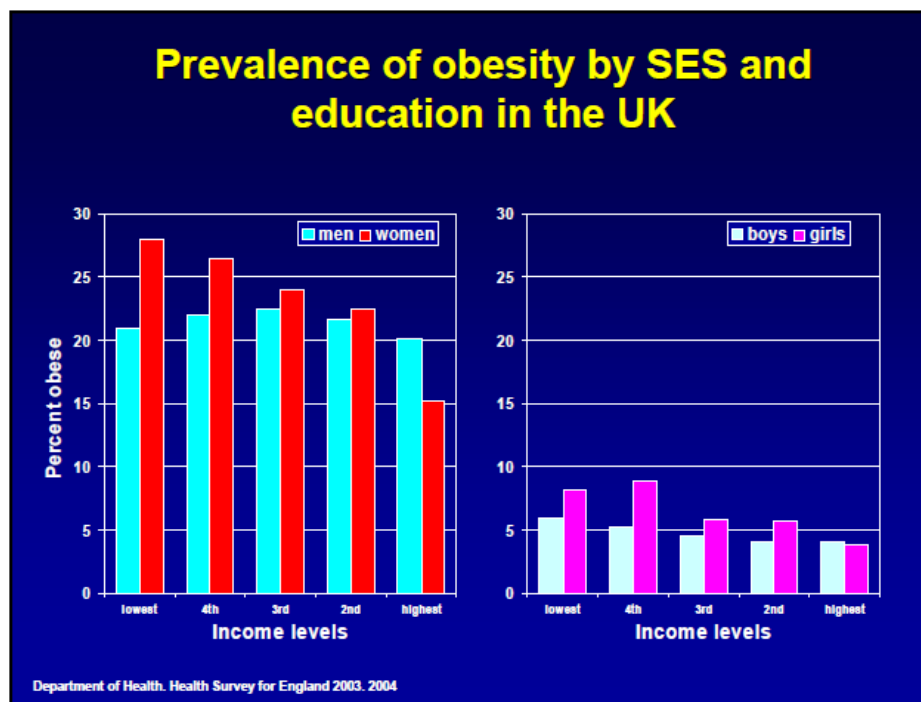
So when you start looking at poverty and adult obesity across small geographic areas, and not by state, suddenly you see a very sharp SES gradient. This is because there is more contrast between rich and poor neighbourhoods than there is between states, such that the SES scale is stretched out and expanded. For example when you look at poverty and obesity at state level, percent of households below poverty varies

from 5-20%. But when you look at percent of the population subsisting below poverty in different California counties, you see that the range is much wider, going up to 25% poverty or above. These techniques allow you to reveal some of the associations between poverty and obesity which you may have overlooked using conventional survey epidemiology.

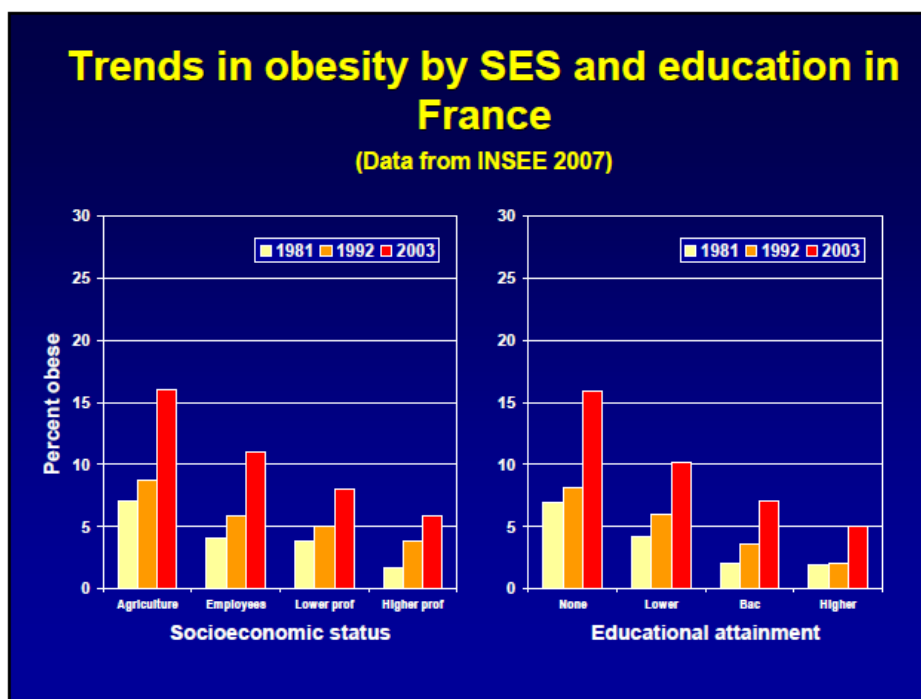
Data from the European Union show similar trends in obesity rates, with higher rates observed for the more disadvantaged groups. Notice that obesity rates are about 20 to 25% for the lowest income and least educated groups.



Mean obesity rates for EU member states reveal the same inverse association with education and incomes, though of course the rates are still lower in comparison to the US, 10 to 12% and not 25%. You may say it is a matter of time before the obesity rates go up and the EU is right up there at 25% obesity prevalence. What we are also seeing is similar social trends: the relation between obesity and SES is stronger for women than for men and the temporal trends by social strata seem to be similar. It is fair to say that the same mechanisms mediate the link between SES variables and body weight in the EU and the US.



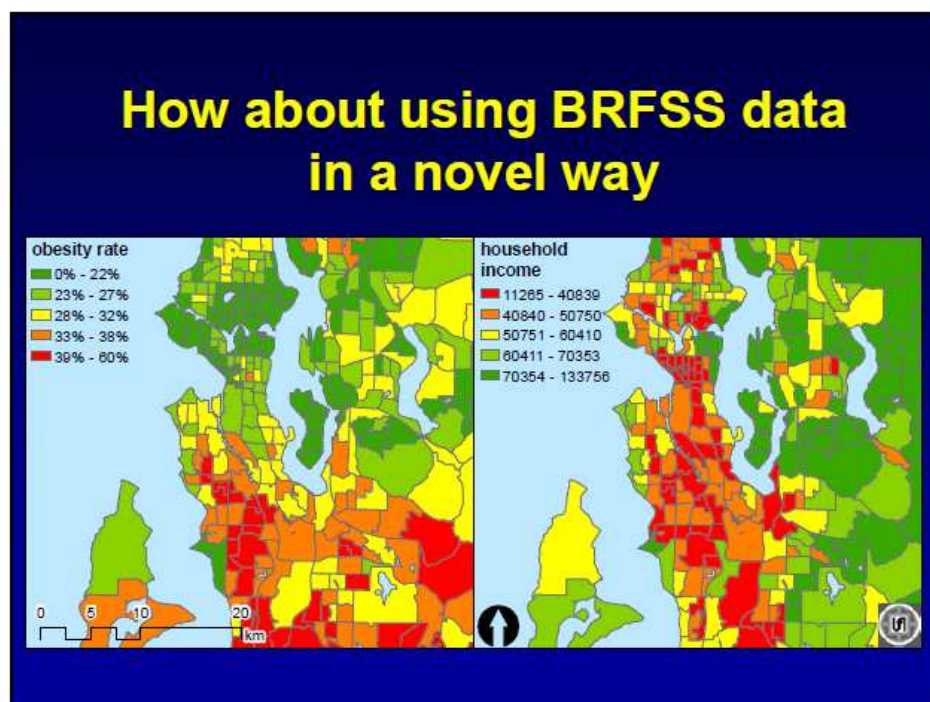
Data from the UK show that obesity rates vary inversely with income levels for adult men and women and with parental income and obesity in boys and girls. Again, the association between weight and incomes was stronger for women than for men, similar to findings in the US. However, time trend analysis in Europe show something that the US data have so far failed to show: that it is the poor who are continuing to become obese and the gradient is growing with time.



Data from France also show temporal trends in obesity rates by SES and education. Again, if you look at agricultural workers and employees the differences in the time trends were much more pronounced than they were at the upper end, the category

professional and the higher socio-economic groups. The lowest educational and the lowest income segments have experienced higher gains in obesity over time. The SES gradient is well shown on a graph, produced by Nicole Darmon, who calculated obesity rates by monthly income (Euros/month) data from 1997 and from 2006 using OBEPI data. The increase in obesity rates was highest for the lower income groups. That was a nice consistent demonstration that not all social classes in France were getting equally obese. Obesity is, to some extent, a problem of poverty and most likely to increase among the lower income less educated groups.

In conclusion, let me offer a few thoughts about the potential reasons. What factors mediate this relation between SES, limited access to resources and services, and higher obesity rates. Socioeconomic status carries with it a number of associated – yet often unobserved variables – notably ease of access to healthy foods. The access need not only be physical (distance, time), it can be economic as well (affordability). Because where you live actually does make a difference in terms of being able to shop, being able to buy healthy food and also having access to resources and services. Some of the studies that we have been conducting in Seattle include analysis of obesity rates by Zip code. We are using area of residence as a proxy for individual or area based SES. We actually used housing values and property values as a proxy indicator of accumulated wealth. In survey studies with education and income that never ask about accumulated wealth.



We now have detailed maps of obesity rates in Seattle. On the left, you see a map of obesity rates and on the right a map of household income, both aggregated at zip code level. The University of Washington is the green area on the top left. Microsoft is located on the top right. There is very little obesity in the more affluent areas; most of the obesity is concentrated among low income areas in south Seattle that are

shown in red. Again the map of obesity by Zip code and the map of incomes by zip code was essentially the same map.

It is very difficult to obtain sufficient health data at a fine scale of geographic resolutions: you need to have very large numbers of people. The BRFSS survey with 2000 households per state does not come close. Even though we did aggregate BRFSS data collected over several years, we still had no more than 8,000 persons spread over all of Seattle. Other studies, notably in New-York City and in Los-Angeles, also operate with approximately 10,000 people in the sample. For a health study based on census tracts, we would probably need 60,000 – 100,000 persons. Only those kind of numbers would allow us to make a connection to public health surveillance and mortality data using geocoding and new techniques of spatial analysis.

Maps of diabetes-related deaths also correspond to maps of poverty. In all cases, when it comes to health, social and economic disparities, including poverty, lack of resources, or living in deprived neighbourhoods are the common determining factors. The range of disparities was surprisingly large – within Seattle we found 5-fold disparities in diabetes related deaths, depending on where people lived. The same data calculated by race/ethnicity maybe showed a 50% increase for African Americans or Hispanic Americans over Whites and those have already been talked about showing major disparities about race/ethnicity. A difference of 500% by geographic area which is unprecedented and very difficult to explain. On the right you see a significant relation between diabetes death and property values in each area. Again property values are being used here as a proxy measure of SES.

Access to healthy foods in different areas of Seattle may be one contributing factor. We have been looking at the density of grocery stores in Seattle-King County, WA, plotting the locations of grocery stores, convenience stores and looking at density of fast-food outlets. Within Seattle we also compared the density of fast food outlets and the density of Starbucks. Starbucks is more of a middle class venue as opposed to a fast-food outlet, so notice that the map of Starbucks and the map of fast foods pretty much track obesity rates. This has to do with again geographic distribution of obesity rates by small geographic area.

In conclusion, much of epidemiologic research on diets and obesity rates may have been confounded by unobserved indices of SES. On one hand, healthier diets cost more and are consumed by more affluent people who have better access to resources and are thin. On the other hand, the cheaper and more energy-dense diets are consumed by less affluent people who live in deprived neighbourhoods; have more limited access to healthy food and are obese. So there is no one single factor that is responsible for rising obesity rates: it is the consequence of low incomes and living in the US or the EU of today. Prevention measures need to be multi-sector and multilevel – from local interventions to price supports for healthy foods. This is really case for government interventions and for a combined agricultural and health policy which can take all those factors into account.

Social determinants of health inequalities

Eric BRUNNER

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What I am going to talk about is the macro level of social determinants. (...) What I want to do is in a sense to be your cultural media (...) but what I want to talk about is something very different and that is poverty disadvantage and inequality which are rather different concepts. I want to talk about inequalities across Europe and the relation to the major health outcomes related to low SES, to talk briefly about inequalities within countries and then to talk about what I think and what in our department in London are doing to translate on perspectives into policy.

First of all we need to be clear about poverty and disadvantaged in rich countries. We know perfectly well that there is an extremely strong link between poverty and poor health across the planet. You can see that in Africa, life expectancy at birth is in the order of 40 years whereas in rich North it is in the order of 70 or 80 years. In the rich countries multiple disadvantages across the life nevertheless produces great differences in health. And these multiple disadvantages relate to a number of phenomena: wealth, income housing, area of residence, education, health, culture, employment, social networks and social relations. And this is related to the concept of social status, social positions and the importance of the social in understanding the way that health is distributed across society. This means crucially that health disadvantage is not limited to the poor although of course those who are poorest are the ones who have the greatest health disadvantage.

The observation that was initially made by economists such as Preston and Richard Wilkinson about 15 years ago is that in richest countries, important but only small proportions of the population live in absolute poverty. For example in America most people have fridges, TVs, air conditioning and so on but that does not mean that they share the fruits of their society success. In the richest countries there is little or not relation between GDP per capita and health and that showed in the left hand panel where this tendencial curves illustrates that increasing incommoded economic growth is associated with improved health in the developing countries but once we go into the very richest there is no relation between GDP per capita and health. Nevertheless in the right hand panel you see an example of the way in social inequalities and health within countries continues to be large. So this is looking at the relationship between income and health at the individual level in this case in the US of America.

What I want to do is to look at the main diet related causes of ill health at the population level to look at the relationship between education on one hand, standards of living on the other in relation to healthy life expectancy, CVD and Cancer mortality. A definition comes from the WHO for healthy life expectancy it is the average number of years that a person can expect to live in full health taking into account years lived in less than full health due to disease and/or injury. This counting

method that contracts the number of years which are spent with disabilities and that index is put together with these two indexes which are the components of the United Nations Human Development Index. I have not been able to use the human development index because that itself contains a health measure which is life expectancy. So, I have drawn out the two components, the GDP index which is an index based very simply on the GDP per capita and then the education index which is a combination of a measure of adult literacy and the combined participation rate in primary, secondary and tertiary education.

These are the two measures that I am going to be using to measure social development.

Here we can see the differences between GDP per capita, so this is the average income in a country plotted against healthy life expectancy on the y axis. As you can see there is an astoundingly strong relationship between economic development in a country and its healthy life expectancy. The correlation is about 0.9, we can then focus on the group of richest countries which are of course the ones in Western Europe including France. As you can see them listed on the right hand side of the slide, Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland and the UK. When we look within these 16 rich countries, there is no relationship between healthy life expectancy and GDP per capita. In education and healthy life expectancy we can see that there is a moderate link along association across the European regions. We can see countries like Albania or Romania down there with a healthy life expectancy of about 60 years, the richest countries up above 70 years. And again if we look at the rich 16 countries, there is no relationship with education as measured by this index. So what we see is that the healthy life expectancy is less than 60 years in Russia, more than 70 years in rich Western Europe and is intermediate in central and eastern European countries. We can see very clearly a strong link between average income and healthy life expectancy and a moderate link between education and healthy life expectancy across the boards. But within the rich 16, no relationships either between GDP per capita and healthy life expectancy or with education and healthy life expectancy.

Now we look at more specific causes of mortality. On the left hand side we are looking at cardiovascular mortality which is a combination of heart disease and stroke predominately and on the right hand side with cancer mortality. And we can see a very clear pattern across the whole of Europe as a strong relationship between GDP per capita and cardiovascular mortality. In the rich 16 the relationship disappears. But for cancer, there is really no relationship at all, there is not a socio-economic relationship. With the education index, the pattern is essentially the same. You can see that countries with a higher level of education and participation have lower rates of CVD mortality but these relationships disappear in richer countries and by the same token for cancer across Europe, there is no relationship with education level. So for CVD mortality high average income leads to low CVD rates, there is a strong link. For high education levels there is a moderate link and there are no associations in the richest countries such as France. For cancer mortality it is not clear that there is a link between high income and low income rates. There is no

association between average education level and cancer rates and no associations in the rich 16. And for healthy life expectancy the large differences across Europe are driven by large differences in the CVD rates. Average national income i. e. economic growth is not important in the rich countries of Europe.

If we look within countries we get a different picture. This is for the regions of Italy, this is a recent paper produced by Robert Devoli and what it shows is the higher the income inequality within an Italian region, the lower the healthy life expectancy. For Sicily for example, there is greater income inequality and there is lower healthy life expectancy. This can be repeated across the European regions, within countries income inequality is a crucial health determinant.

Another way of looking at this is at the individual level and this is the study which I work on based in London. This is a group of 10'000 civil servants, looking purely at the men and the important point we recognise here is that all of these men are insecure employment if they have not yet retired or left the civil service. There is no absolute poverty. They work in very vertical organisation. And what we see in the graph is that there is very clear trend in a lower employment grade if you have less income, less power in your job, then you have a higher rate of heart disease. When we look at the contribution of behavioural factors, we found that if we look at the statistical panel or smoking, diet, physical activity and alcohol consumption then we can explain almost half of the gradient. So there is no doubt that health behaviour is important and by the same taken it is very strongly related to your social position and your economic occupation position. What we found is that income inequality is a measure of the social high rake. We found that the health of individuals is exquisitely sensitive to the social cultural economic environment. This means that in terms of policy to address long standing and very stubborn structural issues around social inequalities and health, we have to tackle issues such as unemployment, poverty and low pay. But we also have to think about factors such as income and taxation, the difference between the rich and the poor because that has an impact on many different levels as well as the behavioural issues such as the quality of parenting, nutrition, exercises and substances abuses.

We translated it into a booklet which is downloadable from the WHO original web site in French, German and Russian called 'the Solid Facts' and it summarises the ideas which emerge from the work on relatives inequality addressing food that is only one among these ten different messages.

On the food front, we can see that we are arguing for a number of structural changes in the food system. This means that local national and international government agencies all need to be involved in this process. We need to integrate public health perspectives into the food system, we need democratic transparency decision making in food regulation matters and we need a participation of stakeholders including consumers to ensure that this democratic countable process goes forward. As part of that, we want to promote sustainable agriculture and food production, stronger food culture for health especially through schools, education forcing people to know their food and nutrition and cooking skills which are lacking particularly in the UK. In addition to that we want health promotion and health education of the more tradition variety. This is clear that these are the prerequisite for tackling what we see

in the top right hand panel which is the relationship between mortality from coronary heart disease in relation to F&V supply using FAO data and selected European countries. What we can see is the strong relationship where countries such as Ukraine and Bielorusse have standardised mortality rates of 800 per 100'000 in comparison to Italy and France where they are down 100. These are massive gradients but we can not see F&V consumption purely in isolation, we have to relate it to the socio-economic context within each country.

In conclusion substantial inequalities in health persists in the richer countries, the concept of relative deprivation and poverty capture the situation. Greater social justice rather than economic growth is needed to reduce health inequalities. Structural issues such as unemployment, low pay, social exclusions, and cycle of deprivation are primary. Behaviour change such as improved nutrition will follow.

Q&A

PUBLIC: Just one comment. The European parliament recently came out with a proposal in of its report to lower across Europe the VAT on F&V. I do not know how realistic that is but certainly something that the Committee adopted and is probably through discussions at the European level.

E BRUNNER: That is terrific news and thank you for bringing it to the conference. This proposal to reduce VAT on F&V, do you know what the state of this proposal is? Can you give us any more details? This is a perfect example.

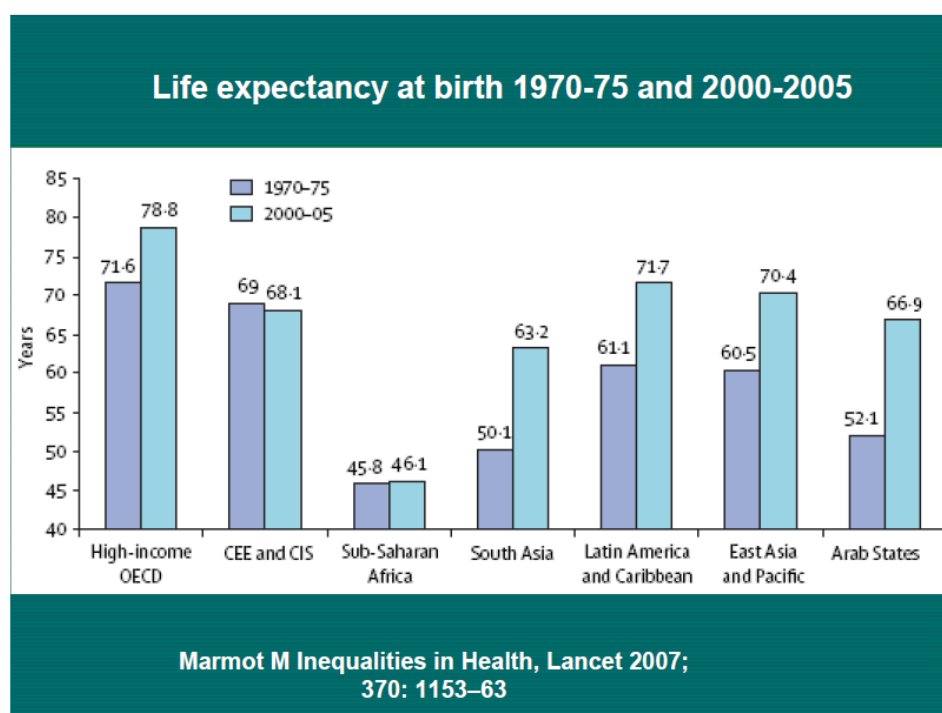
PUBLIC: There are two things, the European Parliament for those who are not so familiar with it, the responsible committee has always had the chance to come up with what is called an own initiatives report. So it is not the legislative proposal that comes from the commission but that is something that they came with themselves and this is a report on how to fight obesity and the responsible committed on environment and public health adopted it on Tuesday May 27th and it will now go to plenary and normally if it goes to a committee as such it has a very good chance of being adopted in plenary next month in Strasbourg. Then it is in the discussion. It is a whole package of initiatives they propose and the lower to fight obesity among children so they would then analyse which or the proposed measures from the parliament are realistic and work further discussions.

How to lower inequalities?

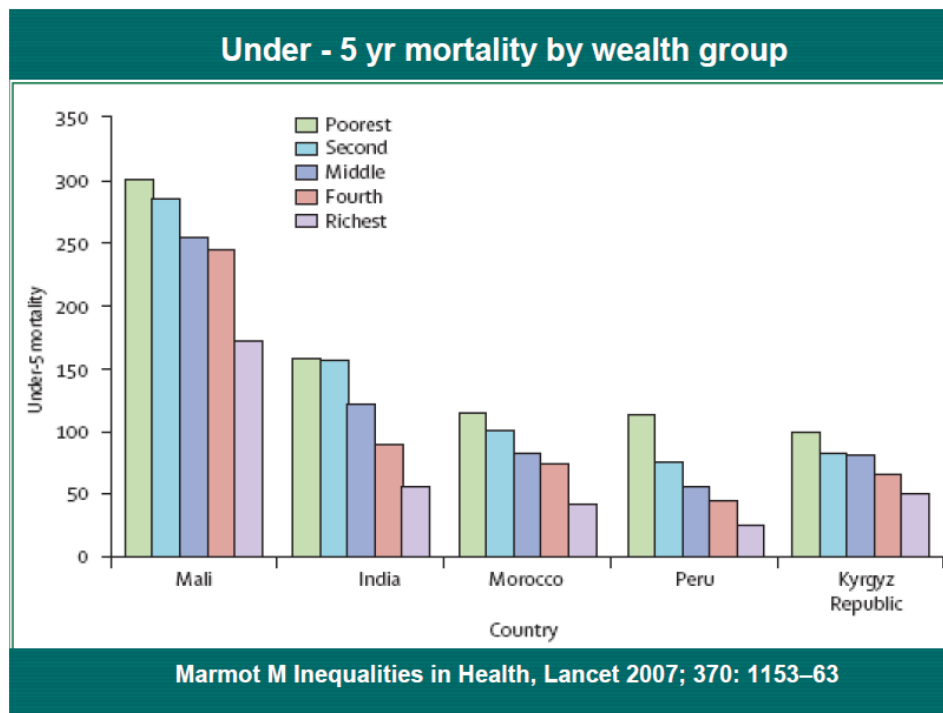
Philip JAMES

LSHTM & IOTF/IASO, London, UK

As a result of this meeting I presume you all know now what to do? You are not politicians and are not involved in an industrial business so your approach can be perfectly straight forward. We need to make sure that social structures are improved to help the disadvantaged. Inequity is at the top of the political agenda for the WHO and I thought during a recent conference in Geneva they were going to produce the answers. However, they did not although a report in the Lancet a year ago essentially highlighted the Europe dilemma of inequalities. If, however, you look across the world, you see astonishing greater differences e.g. in life expectancy.

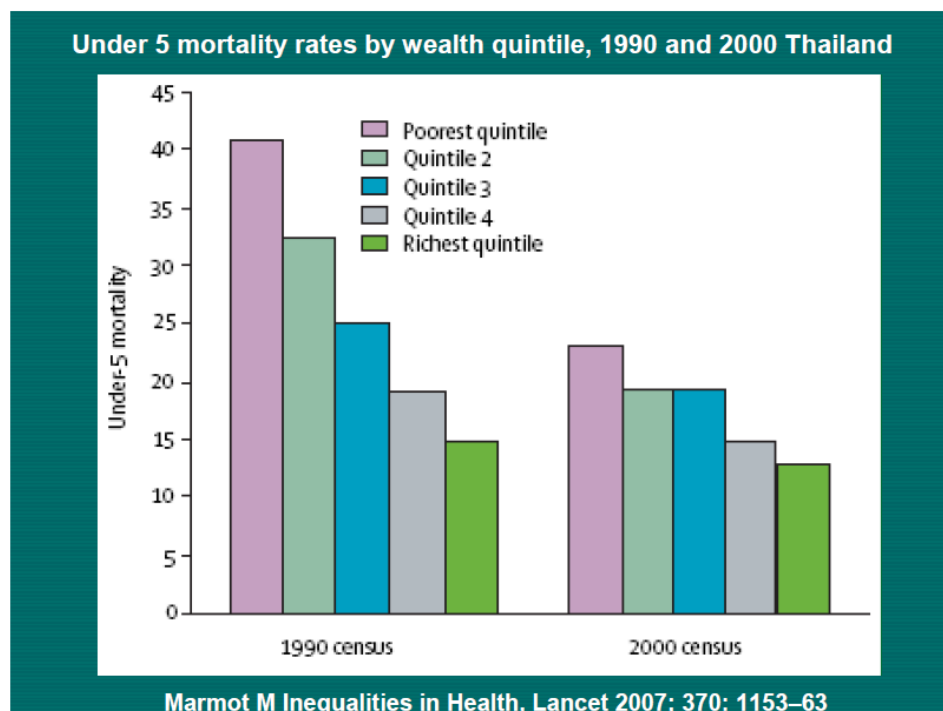


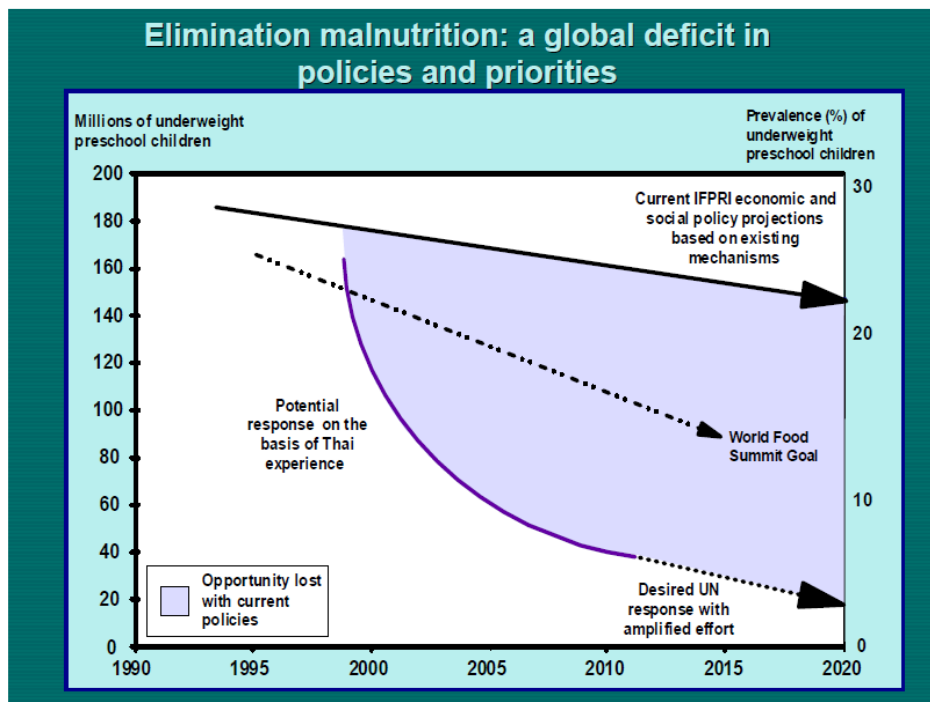
The figure shows that over a period of 15 years some countries have improved life expectancy but for example in Sub Saharan Africa there is no change. You can take the life expectancy or go to issues at the top of the G8 political agenda i.e. the Millennium Development Goals and ask about under 5 year mortality rates across the globe.



The second figure shows astonishing differences between countries. But also within a country you have pretty amazing gradients too. All these figures are in the Lancet paper. It seems practically impossible to do anything about these differences until you look at the problem in detail.

Here in the third figure are data from Thailand that we looked at when I was Chair of the millennium analysis of nutrition across the world. Notice how in 1990 there is an enormous gradient relating to income but there is not nearly such a gradient 10 years later.





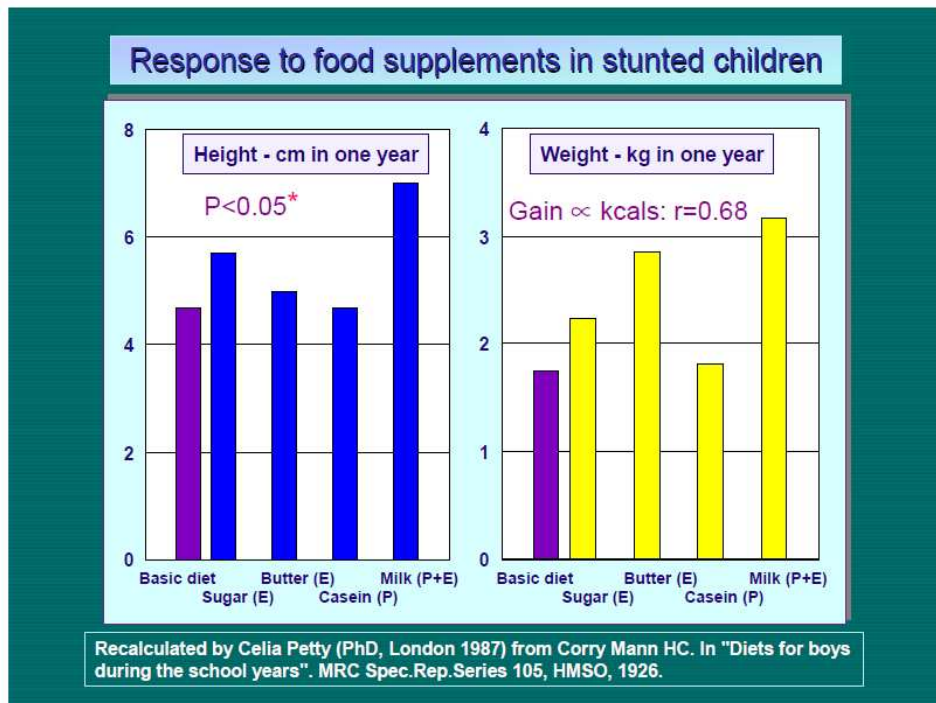
In fact if you look at the malnutrition rates in Thailand there has been an astonishing fall over 13 years in the malnutrition rate. The question is how did that happen? Is it simply that Thailand got richer? The answer is no. In the fourth figure you see on the left that malnutrition in 1990 affected 182 million children globally. The Millennium Development Goals wanted there to be half this number by 2015 (the dotted line). If in fact you rely on the classic western concepts of people getting richer in the country as a whole so that poverty is eliminated by the "trickle down" effect then when you look at all the modelling of what that means in terms of eliminating poverty and malnutrition, the top straight line shows what the International Food Policy Research Institute in Washington calculated would happen. In other words, the idea of relying on our current financial processing and systems is totally irrelevant if we try to tackle the health issue. Down at the bottom is the sweeping line of what would happen if the world took on what Thailand did. What did Thailand do? It fundamentally involved society; it changed the social structure of wellbeing for children in every village; local people were recruited by the villagers and they were linked to every branch of government with the royal family and everybody involved. The dominant thing was how the villages actually made sure that they gained total access to every component of the welfare, financing and another systems made in theory available by government but in practice not used because of the bureaucratic and other incompetences in the whole system. So in fact you can do an enormous amount it is not based on the free market concepts of relying on individual effort that dominates current international thinking.

We spend our lives as individuals being made responsible for everything and if you take the educational approach of telling people what to do then you amplify the differences between the socio-economic classes and educational groups. It is a major social disadvantage for society if you simply emphasize nutrition education on its own. You have to do other things and this is all to do with changing the environment and circumstances of the disadvantaged.



Because we are in F&V meeting I thought it might be helpful if I quickly told you my experience of going from being a respectable doctor to running an agricultural institute and spending my time with economists, Ministers of Agriculture and policy negotiators in Brussels.

If you look across Europe only 100 years ago we were nutritionally dependent on the area in which we lived and were dependent fundamentally on the crops that could be produced locally. You would not believe it but that photograph is what I spend my time doing in my holidays in the mountains of North Wales. What happened? Policies changed because my predecessor as Director of the Rowett Research Institute was Boyd Orr who with colleagues undertook studies on short poor children in the UK.



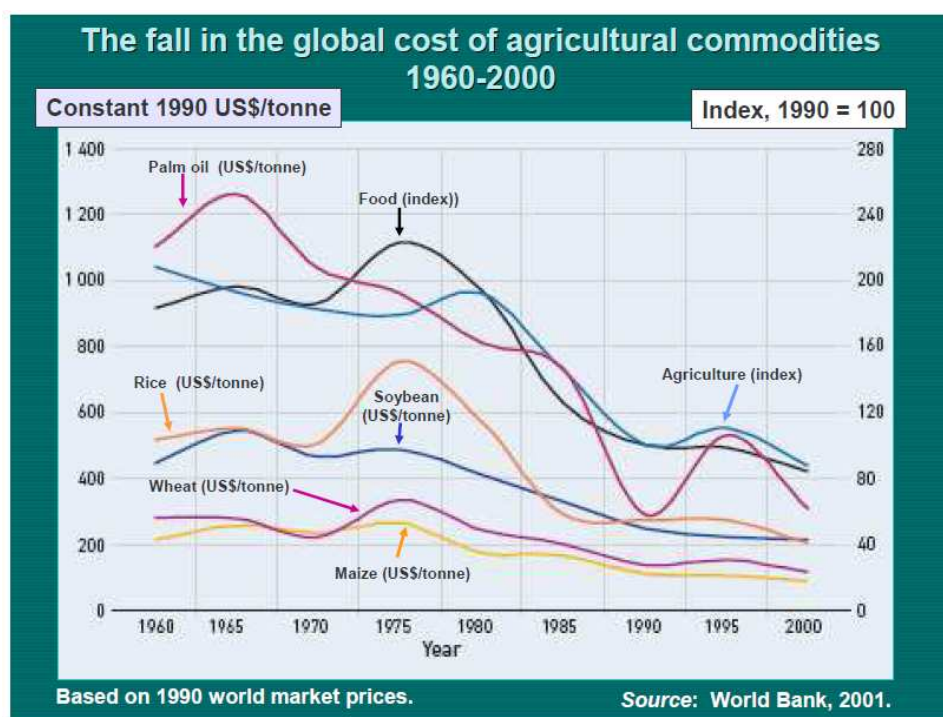
Everybody thought that the short children in the UK were genetically small and with the poorest class being so fertile compared with the tall aristocracy we were in danger of becoming a poor dwarfed nation! However they then experimented and divided the stunted children into groups and fed each group a selected amount of extra food. The basic diet in purple on the left of the figure shows the resulting increase in height and on the right the weight increases. Notice that what actually led to extraordinary increases in height was milk. You get minor increases in height but wonderful increases in weight with butter and sugar. So this was fantastic news because the children were not genetically stunted and then after all - it was something to do with food and poverty. The same applied throughout the world. Even now most of the EU feeding systems for malnourished children abroad do not deal with the problem of stunting because they provide vegetable food, not animal protein. However during WWII in Britain we were all fed with free milk, free orange juice and free cod liver oil and every child at school had routinely free meals of a

carefully specified quality. You may think this was the result of brilliant government thinking but in practice it almost did not happen. After the war, the UK ministers of Agriculture and Health got an Award from *America for their work* but I was privileged to know that the data from my institute had to be taken to London to prove to a reluctant government the fundamental poverty issue and the need for high quality food. Unless this was made freely available and everybody had exactly the same allowance of milk, meat and butter then the country's population would suffer. In fact British health, even taking into account war casualties as well, improved during the Second World War and did not deteriorate.

Therefore Boyd Orr had used his food, health and income survey of poverty throughout Britain and proposed a radically different approach which led to a complete transformation of food and agriculture policy. When I went to see thousand of cows the farmers were happy because they could still sell their milk at a guarantee price and 50% of any capital investment in the farm was automatically paid by government. They had free R&D, free advice with people coming into their farm at all times, they had a guaranteed market and they were important because they were helping the world produce food - they were the valuable members of society working on the farm.

This approach was copied everywhere and we have now an agriculture policy throughout the world dominated by doing everything possible for fat, butter, milk, sugar and meat production. Farms subsidies still run at enormous rates. What I am saying is that for 60 years, governments throughout the world have systematically put trillions of Euros to nourish selective parts of the food system. F&V have been the lowest ranking group.

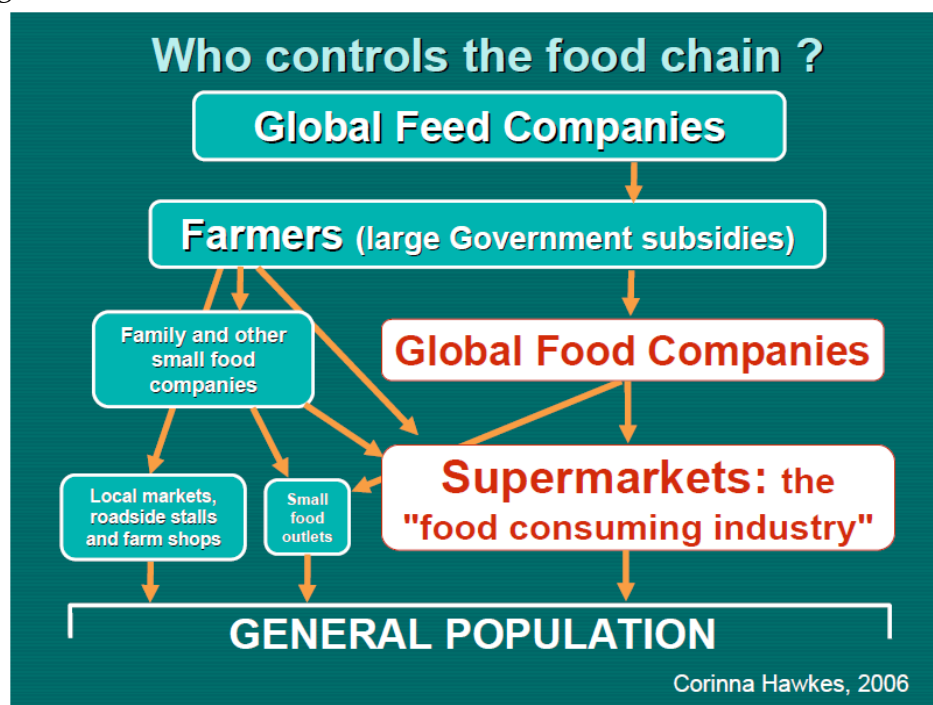
When I took over I think there were 44 agriculture research institutes in Britain with a huge number devoted to animal production. The horticultural groups and institutes that I related to were few and far between and had far less money than the powerful animal based institutes like my own.



What effect did this selective agricultural support policy have? Although there is a huge debate about the current effects of the Common Agricultural Policy (CAP) in Europe there have been enormous effects on the price of specific foods. Notice the drop in both oils and food prices in general - including cereals in the next figure. This is a major effect of all the enormous efforts made by governments, the research community and industry over the years. An analysis in the US shows that the food and agriculture policies have completely distorted the relative price of different foods and shown that there has been a relative increase in the price of F&V and a drop in the price of meat, oils, fat and sugars. So we actually have induced our population's nutritional problems but we now also have the evidence from agricultural and food policies about the mechanisms needed to overcome these policy errors.

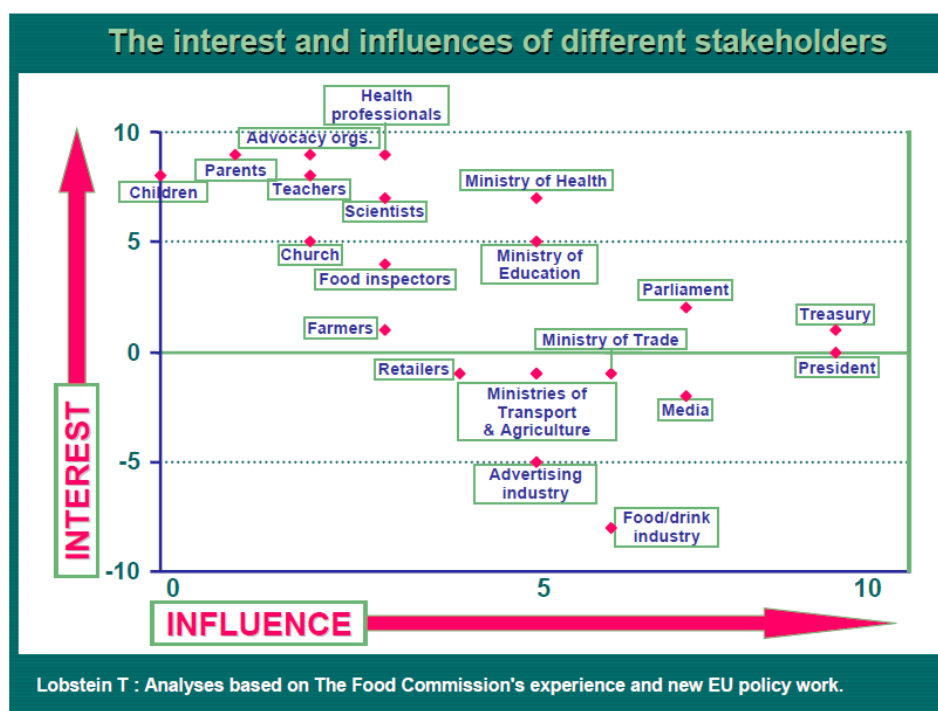
It is well known in the food industry that you can actually change a population's food purchasing and food related behaviour by manipulating the price of foods, making them available everywhere and by marketing them intensely. So now with all the decades long support by governments of the food sector we now have incredibly powerful food industrial groups with enormous influence - the fast foods industries can now obtain ready access to any president or prime minister within 3 to 4 days. By comparison how long does it take one of you to have an interview with your Prime Minister or President?

We always worry about the industrial marketing to children but we fail to realise that the marketing to adults is phenomenal with new special neuromarketing techniques to circumvent normal decision making. Thus the alcohol industry in Britain has converted young women from being almost non alcohol drinkers to be incessant heavy drinkers within the matter of 15 years with huge social and medical consequences. Big industrial groups can manipulate the whole of a society if they are really organised and know what to do.



The question then asked by Corinna Hawkes, is who controls the food chain? On the whole everybody starts talking about the bottom of the chain i.e. the general population. However the figure shows that it is the big organisations such as supermarkets, food companies and fast food chains that tend to dominate and farmers do not have ready direct access to the so-called "free market". The farmers in some countries do have large Government subsidies so how we are going to change the system to benefit society once more?

One issue comes from Tim Lobstein's analysis where on his graph, on the left hand side, people have no influence. But as shown at the top, if you are in the health business, you find advocacy groups of health professionals who have enormous interest but no influence. Across to the right you have the President and the treasury that are essentially influenced by political and economic issues. So the question is how do we induce change given this political reality? If you believe that simply presenting government with the facts work, then you do not know anything about politics! Politicians make decisions not on a basis of facts but on the basis of political advantage and on what seems to be appropriate at the time. So in fact you need to start moving society as a whole if you are going to make progress through the political system.

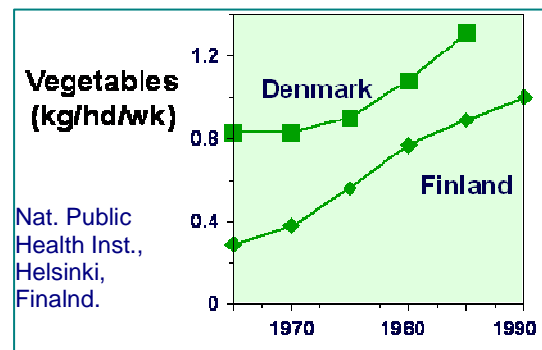


We heard that the educational approach is actually the usual approach in the US. In fact, everything in the US is based on the individual efforts of informed people. So the British Parliamentary Health Committee went to the US to investigate because we know that the US was much more dynamic than Britain in responding to challenges. We rapidly discovered we were wasting our time because everything is done at the grass roots, general population level in the US which is the most costly and politically slow and ineffective way of changing society. In the US and in many

other countries at the federal or national government level and quite often at the state government the decisions are completely controlled by huge industrial interests. The State Department of the US in its interactions with for example WHO essentially reflects not the interests of the US people but policies favoured by the fast food industry. So we have to understand the politics before we begin to move. How do you change things? Let's look at evidence of how things can work.

Here are the data from Finland on how they transformed the health of the population. The figure shows a trebling in vegetables consumption over a 15 years period. How did they do it? They made F&V an intrinsic part of every main meal

whether they are served by government or business or any canteen or restaurant in Finland. The cost of F & V was automatically included in the costs so the poorer people did not selectively have to pay extra for F&V. There were 19 government initiatives but that was a critical part. New data from Denmark suggest that if you monitor the way in which different classes change their



behaviour when you adjust food prices and you actually monitor thousands of families on a weekly basis for 4 years, as done by the Food Economic Institute, then by having very moderate changes in the taxes or subsidies on different foods you can induce marked improvements in food purchases based on the social class gradient: the poor benefit more than the rich. It is well known that whatever the average income in the population you have relative inequalities in income and it is the relative price of different foods that actually affects the purchases of the poorer classes because they are in an environment where they also spend their money on non food issues. So the way they can maintain the range of desirable purchases is by going for cheaper foods. If you change the relative costs of foods the poorest part of the population can gain most. However, you need to understand that as with tobacco and with alcohol, if you put up the price of sugar, fat or meat then it is a regressive thing. In other words, the poorest are tending to have to pay more. Therefore you need additional financial systems to be used to help the poor as well.

People also need to be helped by the use of nutrition profiling to generate a traffic light food labelling system which highlights the good and bad foods. This system is understandable by all classes in society and affects food purchasing patterns. So there is evidence that you can do things to help people to choose more widely but you need to have agreement on this system so the people do not have to work out many different labelling systems.

If you look at the agricultural future of the world, everybody predicts that meat production is going to go up but that is a self perpetuating process because the meat and other industries overwhelm decision making by governments and people at the moment. If you actually want to change things, you have to begin to change the whole structure of the environment. One can also list 5 simple measures. We need a major drive to increase/sustain breastfeeding, we need strict marketing restrictions,

and we need to control food, fruit and vegetable availability. We also need to transform the physical facilities for children and adults so that they become spontaneously more active as well as using leisure time for activity. Governments have huge opportunities to do things. In a school environment but it is quite clear that you need parent contracts because the biggest problem quite often nowadays is that the parents themselves do not know what to do and as in Finland it was the children who educated the parents, not the other way around. Finland also produced clear evidence that this approach was necessary.

We have to really think about potential mechanisms based on real political mechanisms. Here in France in the Parisian government and in the French Senate you have political groups that are extremely anxious to do something for F&V. You need to, if possible, combine industrial and health interests because that is how it worked before. So, there are mechanisms for doing it but if we do not work together to develop systems and simply rely on education then we will fail - we have to develop appropriate economic and social systems. We have to recognise and accept that we are going down the wrong route at the moment and the consequent future health costs are totally unsustainable. If we do not do something fast we are going to be in an unsustainable, financial mess because the McKenzie group already reckons that obesity alone in the world costs currently 700 billion dollars a year.

In conclusion, of course we cannot solve all the problems linked to poverty but we now need to use the social, economic and political mechanisms available to us to involve communities. We need to realign the systems of food provision and look at agricultural development in a new way. Then we can begin to transform the well being of the whole of society.

Q&A

E BRUNNER: What we heard in this conference is that there is a major public health issue in the world and particularly in Europe where affluent is generating massive health inequalities which are food related. You heard many ideas about what need to be done, what should we do?

PUBLIC (Mariano WINOGRAD, Argentina): In session 17 we discovered that even if all you have said is true, we are in the middle of a paradigm change. M James showed us figures where pricing were going down until year 2000. In the last 2 or 3 years, after bio fuel alternatives for sugars and fats and agro inflation, this tendency is changing. M Drewnowski showed us the relation between obesity and poverty but his fat in the situation where fats and sugar were cheap. This is not true anymore. I agree absolutely with Mister James proposal but I think we need to take care of this situation because his figures are taking care of this situation. In the last 2 years and in the last 12 months, the situation has changed absolutely. Maybe this pushes us faster to this need to promote F&V because it is not just a problem of obesity but maybe problem of supply element.

E BRUNNER: You make a very valuable point around the issue of food prices which has an impact on the poor or the relatively poor for the most. Therefore this is a fantastic opportunity for those who are working to promote the consumption of F&V.

A DREWNOWSKI: I have been looking at the new nutrition transition and its potential consequences for obesity. We have the idea that the global obesity epidemic has been riding on a wave of cheap sugar and cheap fat. The prices of these commodities have in fact tripled over the past year or 2. I have a pessimistic economic theory which suggests that the rising global prices of sugar and fat will be accompanied by a paradoxical rise in obesity and diabetes through a phenomenon known as Giffen behaviour. The theory suggests that a rise in price of an inferior good, consumed by the poor, goes up and if that good accounts for a large part of the food budget, then the consumption of that good also goes up, contrary to the law of demand, because the alternative foods have become prohibitively expensive. So as a result, the rising price of sugar and fat may lead to increased consumption of sugar and fat and even higher obesity rates. It is a very pessimistic theory but this is where we are.

P JAMES: if you look at the global systems we have got a major problem in terms of use of lands. One of the biggest problems comes from the emphasis on meat production which is therefore triggers an extraordinary change in the agriculture systems. Major government such as China have been making all the wrong decisions promoting enormous meat production inappropriately when in my institute we showed you can do it in completely different ways. Current governments,

international policies, are all geared the wrong way and you could do something to begin to overcome the problems you highlight.

A DREWNOWSKI: Just to add that some researchers have modelled what would happen if you increase the price of unhealthy foods (high in fat, salt and sugar) and it showed that it might lead to a decline in F&V consumption. So I think this is important that in this situation of increasing prices, to do what the European parts suggested to look very closely at price of F&V and make possible to reduce them through tax changes.

PUBLIC (Moddie MATSWAMA from the UK): A question for Eric Brunner, why was a social gradient in GDP per capita for cardiovascular disease but not cancer? And could that be partly related because of the fact that diet play such a significant role CVD in comparison to cancer? Then for Philip James, what would you summarize as the sort of three main priorities for reform of the European agricultural policy?

E BRUNNER: To answer to you first question, you are quite correct. It would appeared that dietary determinants of cancer are perhaps less evident and we have seen during the course of the conference that from the last couple of years that there has been something over retrenchment in relation to this question although it would make change again in the future with the evidence accumulated. What is also clear is that the impact of economic growth and inequality is very strongly related to obesity and to the dietary determinants of obesity which is very intimately linked with the risk of diabetes and cardiovascular disease. So, this seems to be the focus from a public health perspective that we need to focus on.

P JAMES: I would like to take the question in a slightly broader way. For example, first thing I do is that I would stop the export subsidies at the EU and then try to get the US got help us and also agree. The fact is US and EU together put 1.1 million farmers in a third world out to work on sugar alone. The second thing I would do is to reorganise the priorities in terms of what you are trying to promote or inhibit and we should not producing any sugar in Europe. The whole issue about F&V needs to be put in a completely different strategic model looking at the use of lands. If you look at Europe as a whole, there is fantastic opportunity and actually the whole of the CAP system despite why we are here has been manipulated to downgrade F&V availability and so on and it was complicated. The third think I would do is the R&D of agriculture needs to be developed. Shivasu is giving a brilliant working group at this meeting and the issues of agriculture in terms of lands use and vegetables and fruit R&D and how you actually get that moving both on a European and global basis is a fundamental responsibility in the EU.

SESSION 23

ROUND TABLE: INCREASING F&V CONSUMPTION IN DISADVANTAGED POPULATIONS: WHAT SHOULD DECISION MAKERS DO?

REPORT FROM PARALLEL SESSIONS

Chairs: **A Drewnowski & S Hercberg**

Nous allons débiter cette nouvelle session avec quelques modifications dans le programme puisque nous avons la chance d'avoir avec nous le directeur général de la santé et le directeur général de l'alimentation, nous avons préféré, pour des raisons d'emploi du temps de ces personnalités modifier l'ordre des passages. C'est-à-dire que le compte-rendu des sessions de ce matin qui devait intervenir en début d'après-midi est donc reporté en fin d'après midi. On va passer directement à la table ronde qui pose une question importante qu'on attend tous et pour laquelle on attend des éléments de réponses. Excusez-nous de ces modifications de programme qui sont liées aux problèmes d'emploi du temps des responsables politiques qui sont avec nous.

Juste peut-être pour introduire cette table ronde et faire le constat que nous arrivons au terme de ce sommet, c'est notre dernière session en plénière. Je crois que ce sommet nous a permis d'échanger, de discuter, de croiser nos regards, nos cultures, nos approches, nos disciplines. On a eu des sessions parallèles dans le champ de la nutrition de santé publique, dans le marketing et dans l'économie mais on s'est bien rendu compte que ces sessions parallèles, en fait, se rencontraient très souvent et avaient quand même quelques éléments de convergence ce qui a permis d'articuler un petit peu ces différentes approches.

Je crois que toutes ces discussions nous ont amenés à vraiment légitimer les recommandations qui sont faites sur les fruits et légumes, mais nous avons rapidement butté avec le point essentiel, qui a été l'objet de très nombreuses discussions, c'est comment traduire nos recommandations de santé publique – notamment dans le champ des fruits et légumes mais c'est vrai pour d'autres recommandations - en application pratique. Quand on regarde ce qui a été présenté, la fréquence de la consommation des fruits et légumes dans les populations à l'échelle planétaire mais également dans les pays industrialisés, on se rend compte des difficultés auxquelles nous sommes confrontés. Je donnerai juste un chiffre, qui est un chiffre français, quand on regarde le nombre de personnes qui, en France, selon l'enquête nationale de nutrition santé, satisfont les recommandations d'au moins 5 fruits et légumes par jour, nous sommes à un peu plus de 48%. C'est un grand progrès puisqu'il y a quelques années nous avions un pourcentage de consommateurs beaucoup plus faible, on a donc un certain motif de satisfaction si ce n'est tout de même que ce chiffre, même s'il va dans le bon sens, cache des disparités sociales extrêmement importantes. Et quand on compare ce chiffre en population générale à la fréquence des consommateurs ayant accès à 5 fruits et légumes dans les populations les plus défavorisées, on a des chiffres qui sont extrêmement différents.

Les résultats d'une étude française sur les bénéficiaires de l'aide alimentaire ne retrouvaient que 1,2% des participants, soit des personnes se rendant dans ces structures de faible niveau socio-économique qui arrivaient à satisfaire ces 5 fruits et

légumes par jours. On est donc vraiment confronté de plus en plus à ce problème avec des marqueurs nutritionnels qui sont des véritables marqueurs sociaux, c'est vrai pour les fruits et légumes, c'est vrai, comme nous l'a rappelé Adam Drewnowski ces jours-ci, pour l'obésité qui constitue là aussi un remarquable marqueur social aujourd'hui. Et on a l'impression quand on regarde l'évolution dans le temps qu'on a à la fois une fracture alimentaire qui se creuse avec une efficacité des problèmes de santé publique plus grande au niveau de la population générale mais insuffisante pour les populations de faible niveau de revenus. Et cette fracture alimentaire s'accompagne d'une véritable fracture nutritionnelle quand on regarde l'évolution de l'état nutritionnel des populations en fonction donc de leurs caractéristiques socio-économiques.

Donc, ce sommet a essayé, en s'appuyant sur ces bases, d'identifier des freins à la consommation des fruits et légumes ; il a essayé surtout d'identifier des leviers, des pistes. On a vu beaucoup d'actions, certaines à l'initiative d'opérateurs privés, certaines à partir d'organisations non gouvernementales, de milieux professionnels, de chercheurs, d'hommes de santé publique. On a vu beaucoup d'interventions de grande qualité, on a vu l'évaluation qui a pu être faite de ces interventions. On a vu un peu ce qu'on pouvait faire, nous qui sommes dans la salle, c'est-à-dire des techniciens, des professionnels, des membres des filières, des membres des associations non gouvernementales ou des collectivités. Ce que l'on a vu également au travers de nos débats c'est que très souvent on appuyait sur le fait qu'il fallait qu'il y ait une réelle volonté politique et on a eu envie bien sûr de se retourner vers nos politiques, représentant des ministères ou élus mais également d'autres acteurs de la société (notamment les associations) pour avoir un véritable débat en disant aujourd'hui : que peuvent faire, que doivent faire ou qu'est-ce qui a été déjà fait par les politiques ?

On a la chance d'avoir à notre table le directeur générale de la santé Monsieur Didier Houssin, Monsieur Bournigal, directeur général de l'alimentation au ministère de l'agriculture, nous attendons un représentant du Haut-commissariat aux solidarités actives contre la pauvreté, nous aurons également un représentant du monde associatif au travers du président de la Ligue contre le cancer, Monsieur Hirsch. Nous allons donc avoir un débat mais avant de commencer ce débat avec ces personnalités il était prévu qu'il y ait 2 exposés introductifs qui posent le cadre de référence et pour introduire ces deux exposés introductifs je vais passer la parole à Adam Drewnowski.

Adam DREWNOWSKI

School of Public Health and Community Medicine, University of Washington, US

I will distress two themes. The theme of this meeting has been the convergence or alliance between agriculture, public health and public policy and this is not a new idea. The idea of an alliance between agriculture and public health has been stressed by John Boyd in his book on food health and income as early as 1937. So one question to pose is: What has taken so long? Why has it taken 60 years to achieve this alliance? And why are we still talking about it? So this is though the major challenge.

The second challenge is the challenge of health inequalities and health inequities. Socioeconomic factors determine health and one of the major factors is the quality of the diet. Unfortunately, healthy diet are becoming expensive, unfortunately, healthy diets are getting to be out of reach of many people. What kind of agricultural policy can we have that will assure equal access to healthy food for all? So these are the two themes of our presenters, Francesco Branca will talk about international policies on a more general level and then Eric Brunner will talk more about disfavored or deprived populations and what can be done to assure the access to healthy food for them.

Francesco BRANCA

WHO – Regional Office for Europe, Denmark

Good afternoon, thank you very much for this invitation.

I will briefly walk you through some data that have been collected in the regional office and that is about the situation of policies in the European Region about the promotion of fruit and vegetables (F&V).

First of all, I need to remind you that this is European region we are talking about, the former Soviet Union as well and as you can see there is a major discrepancy between the East and the West in terms of availability of F&V.

What you see in green are the countries that meet the recommendations of the 600 grams availability of F&V per person per day. And as you see, the majority of the countries in our region do not meet that recommendation. So we only have 19 countries in Europe that meet that recommendation. There has been a lot of improvement and you have been following this but still, there is again a major discrepancy between Western Europe achievements and Eastern Europe and the newly independent states that are also relying a lot on agriculture and are very much behind the rest of Europe in terms of availability of F&V.

These are data that indicates the availability at the household level, so these are data collected from household budget studies. And as you can see, there are only 4 or 5 countries which really have enough F&V available at the household level. And finally this is the EPIC data to indicate the real data about consumption and again you see that only a few countries of that group achieve the 400 grams a day recommended intake.

So, there is still a major issue about the availability on one side and the consumption on the other side. So there must be a role for public policies and I would like to start with this framework indicating that the drivers of food consumption are both on the demand side and on the supply side. Perhaps in the past we have been concentrating on the demand side, we have been concentrating on taste, the knowledge, the information, the relationship with health, issues like the prices but we have to be more and more concerned about the supply side, about the characteristics of the food supply chain, about the production capacities in the system and about what is marketed and advertised and what is available in shops.

So the governments have a very important role in modulating the balance between the demand and the supply. So it is not only a matter of ministries of health but definitively a matter of ministries of agriculture and ministries of economy and trade.

The global initiatives that have highlighted this issue of being repeating in time and we are here thanks to this global alliance which has been established International Fruits and Vegetable Alliance. A lot is happening in Europe, at a regional level it is very timely that there is a discussion on the reform of the Common Agricultural policy which seems to be more linking the support to agriculture to the actual

presence... and the rural development and not any longer to the commodities. And the white paper that the commission developed on nutrition, overweight and obesity related health issues followed by a constant declaration are certainly going in that direction with the promotion of F&V. And of course thanks to the EGEA conference we are here to discuss all this.

The regional office for European WHO has had a tradition of developing food and nutrition action plans; we are now at the second edition of the food and nutrition action plan. There has been a major advocacy initiative which is the WHO European Ministerial Conference on counteracting obesity. Major opportunities for ministries of health but also some ministries of agriculture to convene and discuss: how we should shape the food system in order to prevent obesity? The second action plan has an important commitment which is to ensure safe health in sustainable food supply and as you can see the improvement of the availability of F&V is number one in the list.

Now I would like to tell you briefly about this policy survey that we have performed. We wanted to show and analyze the current strategies to promote F&V consumption in the WHO European region. We started collecting data in 2003, there was a European survey specifically done in 2007 complemented by literature and web sites search. The first result was finding out the data guidelines are actually quite well established, we have results for about 2 thirds of the countries so you see that we are out of the 54 countries we have results for about 33. And out of the countries who have replied the majority have guidelines and they do specify the promotion of F&V. However, only few, I would say half of them, a bit more than half of them, are specific about this promotion and they recommend five portions or at least 400 grams per day of combined F&V intake. Out of this 19, 11 are even more specific and go down to the level of specifying the portions; 3-5 portions of vegetables for example in Czech Republic and in Estonia, 2-4 portions of fruit in Estonia and the Netherlands has 300 grams of vegetables and 2 pieces of fruits. So, in general there is a good attitude toward the promotion but not always there is a specific quantitative promotion.

Promotions initiatives are common, 21 countries have specific programs; again slightly different perspectives: Hungary has a 3-a-Day program, most countries have a 5-a-Day program, and Denmark has a 6-a-Day program whereas other countries promote F&V in the framework of the national nutrition plan.

This is a table indicating the setting in which these promotion initiatives are performed. You see the governmental -supported and the non-governmental-supported initiatives marked. I would say that in general the schools programmes are the ones that are mainly promoted; in some cases you have workplace canteens or public institutions. But actually, the public sector mainly intervenes in schools. There are workplace programs for example delivered by the private sector, by employers or f... responsibility for their employees. The actors of promotional initiatives are mainly still the ministry of health but you can see that the ministry of

agriculture in some countries is associated so we have, I think, good examples of collaboration and in views of... so the cited society is very important in all promotion efforts. This is also an assessment we did recently to try and see to what extent the countries, the member states, would buy the proposal to provide a better food environment. And, actually, we have disappointing results because in the whole area of the food supply we have only about half the countries who are really engaged. So while nutritional education, nutritional promotions seem to be something that most countries tend to do, still, the provision of healthy food supply is not a priority and you see that, for example, the left caller incentive of F&V production is not something which is very common in the European panorama.

The survey also looks at barriers to consumption and at possible policy instruments to overcome those barriers. Now in terms of agriculture production member states interviewed said that they would see that incentive for farmers to redistribution of subsidies would meet some of the barriers to the agricultural production. But farmers need support in marketing and in promotion of their produce.

At the level of food processing it seems to be a need for more promotion, for better organisation of markets, for more local street markets for example, for improved public transport system, for retailer sailing loose or single packed F&V to allow more flexible consumption pattern, to increase conveniences, convenience of items like washed and pre-cut F&V and better labelling and time posting.

At the level of promotion availability of F&V in local settings, the policy instruments suggested are the F&V content of meals provided my canteens, the issue of price of vegetables, including fruit at dessert in menu, and changing the offer of vending machines and more F&V school items.

And at the level of the individual, still, the mass media campaigns are seen as an important tool.

So, in conclusion of what I would like to point out, the panorama of Europe is improving a lot in terms of awareness. I think there is good awareness and policy commitment; certainly there is an awareness of the importance of F&V intake, this is visible throughout European regions at member states level, at the level of regional agreements; and there is an awareness of the importance of inter-sector work. So, this is, I think, a new thing, of the countries managed listen to b... those recommendations but what is missing is actually action on the supply side. There are campaigns started in the availability of F&V in local settings such as school or worksites widely available, promotional initiatives targeting individuals perform BUT a few promotional initiatives in the context of food processing retailing and limited effort to increase F&V promotion.

I hope this is a message for policy makers both in France and at regional level.

Thank you very much

A DREWNOWSKI: There is barrier on the supply side but there are also barriers on the side of demand. And here to talk about diet quality, poverty, inequality, and food policy is Eric Brunner.

Eric BRUNNER

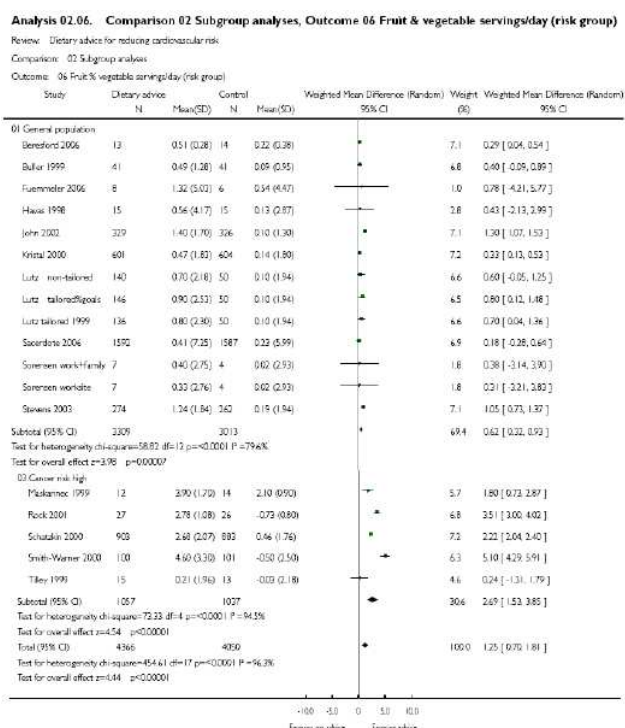
Department of Epidemiology and Public Health, UK

The subject of my talk is both simple and complex; it is the health inequalities policy in the United Kingdom. In my talk this morning I referred to the fact that there are substantial social inequalities in health persisting in all the richest countries. That includes the United Kingdom and France. Greater social justice rather than, or perhaps as well as, economic growth is needed to reduce health inequalities. This means structural issues need to be addressed as well as behavior change. The two go hand in hand and, without change at the structural level we would not see the improvement in health inequalities that we wish for.

First of all, I won't go into these data but, this is a systematic review which demonstrates that it is possible to get the general population to increase its F&V consumption by individual-level interventions such as dietary advice in healthcare settings. However, the change is of course not as great as those people who perceived themselves to be at raised disease risk, for example cancer risk or heart disease risk, those people change their behavior very easily. For the general population we need long term structural policy changes in order to change the food culture.

Turning to the policy in the UK the Acheson report was published in 1998 with the title "Independent inquiry into inequalities in health". Ten years later, in March of this year, a ten year status report was published, which the head of my department Michael Marmot was very instrumental in leading.

First of all we look at the health inequalities targets. This is a crucial point and we need to have health inequalities targets nation by nation. In the UK, the targets are modest. The target, introduced in 2003, is to reduce inequalities in health outcome by 10% by 2010 as measured by infant mortality and life expectancy at birth. The evidence now is that we are making small progress with infant mortality: the gap for the routine/manual group versus the whole population is slightly narrowed, but inequality in life expectancy, measured as the gap between the poorest 20% of areas (the Spearhead areas) and the whole population, is widening. So despite comprehensive policies within the UK we find progress is difficult and slow. However we are not deterred.



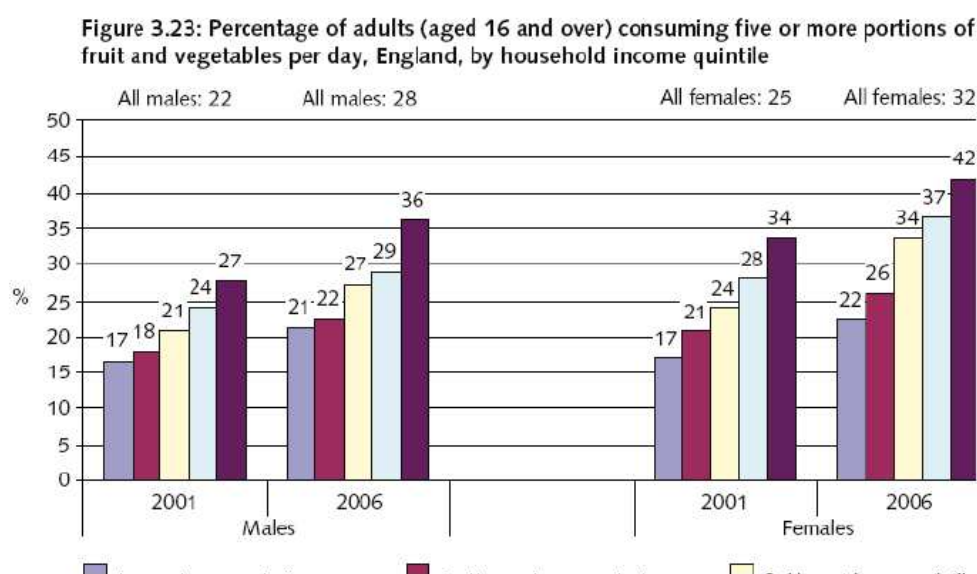
Within the government, across the ministries, there are 12 headline targets: the first target refers to cancer and cardiovascular disease mortality which are good health indicators, the others are teenage pregnancy, road accident casualties, primary care, flu vaccination particularly in low-income populations, reduction of smoking of course, improvement in educational attainment again focusing on low-income groups and the single food related objective is F&V consumption; further objectives: housing, physical activity, reduction of the proportions of children and families below the poverty line and reduction in the number of homeless families.

Progress on the headline targets has been partial, particularly with respect to inequalities; there have been improvements in cancer and CVD rates since the policy was introduced with narrowing health inequalities in absolute terms for both cancer and cardiovascular disease. However, there is no significant change in relative terms for cancer but there has been a widening in inequalities in relative terms for cardiovascular disease. This is because there is a general decline in cardiovascular disease but the difference between the poor and the rich has remained the same.

With respect to F&V consumption, between 2001 and 2006, consumption of 5 or more portions of F&V per day has increased - and this includes households with the lowest incomes.

No significant change in differences in consumption between the households across income groups has been observed. As I show you in this graph, between 2001 and 2006 there has been a similar increase in fruit and vegetable consumption across the income distribution as a result of measures within the UK. However, inequality has not been very effectively tackled. In 2006, about 20% of lowest income households consumed 5 or more per day compared to 40% of the highest income households.

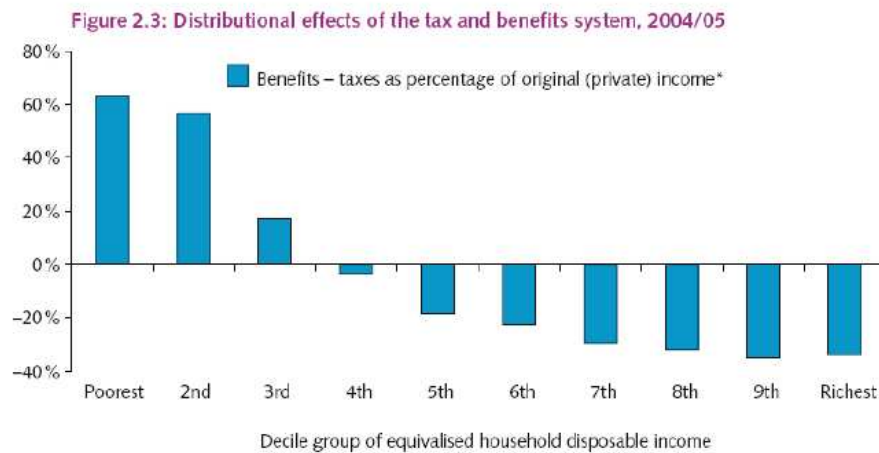
Rising average – same inequality



Just to look at some of the other aspects of UK fiscal policy for a global campaign on health inequalities, we see here the redistributive policies involving the payment of cash benefits and tax rebates and the bars which are going from left to right represent

the ten groups ranked in order of disposable income, and we can see that the data show that money is being redistributed progressively through the fiscal policy from the rich to the poor in percentage terms. However, France and Britain are subject to global problems which result in a market-driven widening in the income distribution which any government will have a problem in tackling.

Progressive effects of UK fiscal policy



Tackling Health Inequalities: status report 2008

The key aspect to health inequalities policy which includes that relative to F&V is targeting. In the UK, we have chosen an area approach, this encapsulated by the drive to reduce health inequalities in spearhead areas which are the local government areas with the worst health and worst socioeconomic deprivation indicators, relating to 28% of the UK population. A strategy to reduce health inequalities requires inter-departmental working. It is essential to work across government and other organizational boundaries with a time-frame to galvanize action. It is also necessary, in the UK perspective, to (1) divert resources to disadvantaged areas and groups, (2) develop the evidence to support implementation of targets and (3) focus action at different stages across the life course from before birth to death.

In terms of government process, the status report evaluates 82 timed departmental commitments and we can see here the examples for the national food and health action plan and two specific targets: the 5-a-Day program and the national school-fruit scheme which are the two major planks of the British health inequalities diet related policy. These timed commitments have been achieved or are in the process of being achieved.

So to summarize, behavioral change such as improve F&V consumption in disadvantaged populations requires a coherent strategy. Important factors include

public health values, political will, and financial resources. In the UK government commitments have been made. In practice, this means national action and coordination, targeting deprived populations and deprived areas, and monitoring progress.

Thank you very much for listening.

A DREWNOWSKI: Judging from the two days of the conference, the research on nutrition has been done. The research on the epidemiological F&V consumption has been done, the research on demographics has been done, policy analysis, behaviour change, all done. So now we need to know how to translate research results into political actions and what needs to be done next. Often, there is a two-way street between research and policy, on one hand research can inform policy but on the other hand policy makers need specific research results to direct their actions. So here today we have the extreme privilege to have representatives of the French government, who can actually trigger certain actions at the national level. And I am extremely interested in knowing what you have to say about the translation of research results into concrete policy given political will.

Didier HOUSSIN

General Director of Health, France

Il y a un très grand nombre d'éléments scientifiques qui ont montré l'importance du développement de la consommation de fruits et légumes pour la promotion de la santé de la population et la prévention des pathologies. Et donc, un des principaux repères du programme national nutrition santé en France a été la notion de consommation d'au moins 5 fruits et légumes par jour, ce qui contribue à protéger la santé. Alors, je voudrais dans cet exposé dire un mot du point de situation sur la consommation des fruits et légumes. L'aspect populations défavorisées sera abordé par mon collègue Jean-Marc Bournigal qui est le Directeur général de l'alimentation et avec qui nous travaillons, si j'ose dire de « conserve », sur ce sujet.

Je voudrais en introduction vous donner un petit aperçu de ce qu'est le programme national nutrition santé évoqué dans les exposés précédents. C'est par essence un programme tourné vers des questions de santé publique mais qui est interministériel, M. Herberg préside d'ailleurs le comité qui chaque mois se réunit et qui rassemble les représentants du ministère de la santé mais aussi de l'agriculture, des finances, de la recherche, de l'éducation nationale. Donc cette dimension interministérielle qui paraît évidemment essentielle sur un sujet comme celui-là est sans doute l'originalité principale de ce programme.

La France s'est dotée en 2001 d'une politique nutritionnelle de santé publique qui est ce programme national nutrition santé qu'on résume sous le sigle PNNS. Un des 9 objectifs prioritaires mentionne qu'il faudrait augmenter la consommation de fruits et légumes afin de réduire de 25% le nombre des petits consommateurs de F&V et d'ailleurs cet objectif était précisé dans la loi relative à la politique de santé publique d'août 2004.

Quelles ont été les actions qui ont été menées depuis 2004 ? La première catégorie d'actions, a été de mener des campagnes dans les médias et en particulier grâce à un organisme qui s'appelle l'Institut National de prévention et d'éducation pour la santé. Il a été possible de transmettre des messages selon lesquels, frais, en conserve ou surgelés, les fruits et légumes protègent la santé, et mettre en avant le repère de 5 F&V par jour, en valorisant toutes les formes de fruits et légumes afin d'élargir la possibilité de choix, et donc la possible comparaison des prix.

Un deuxième aspect qui a été promu, est la notion de message sanitaire. Depuis mars 2007, toute action de promotion pour des aliments manufacturés, boissons avec ajouts de sucres ou de sel doit mentionner un message sanitaire qui est par exemple, parmi les 4 messages qui on été retenus : « pour votre santé, mangez au moins 5 fruits et légumes par jour ». Cela ne veut pas dire que tout soit parfait et qu'il y ait toujours une claire compréhension du message lorsqu'il est juxtaposé à un autre produit, mais on a le sentiment que, peu à peu, la connaissance de ce repère s'est installée. Alors qu'elle était de 2,5% en 2002, en 2007, 43% des personnes interrogées

repéraient le message sanitaire « pour votre santé mangez au moins 5 fruits et légumes par jour ».

En plus des actions dans les médias, parce que chacun sait qu'un investissement dans la publicité n'a de sens que s'il est accompagné au niveau de la force de vente et de la promotion sur les lieux de vente, des actions de proximité ont été conduites dans les écoles et au niveau des collectivités locales principalement (...).

Au niveau de l'école, l'objectif a été de favoriser la consommation et l'appréciation dès le plus jeune âge, comme gage d'une consommation qui perdurera à l'âge adulte. L'idée est de s'adresser en priorité aux enfants avec l'idée que, une fois que c'est installé, c'est installé. D'autre part, l'école a l'avantage d'être un lieu rassemblant tout les enfants et de permettre de cibler parfois certaines zones géographiques, comme le dira, je pense, Jean-Marc Bournigal. De ce point de vue, l'imagination des professeurs a été très grande, il y a eu des événements de toute nature qui ont été créés permettant d'impliquer les familles, de permettre de découvrir l'art culinaire, de favoriser la créativité dans le domaine artistique notamment ou l'ouverture au monde de la production et de la transformation.

L'école est aussi le domaine de la restauration scolaire, et là aussi des initiatives ont été prises pour que la place des fruits et légumes soit mise en exergue notamment à travers la réglementation. L'école est le lieu aussi où circulent des documents pédagogiques et, là aussi, toute une série d'initiatives ont été prises mais toujours, dans un cadre qui permettait d'éviter les dérives à travers l'attribution du logo PNNS fabriqués à l'attention des écoliers.

Il a été bien sûr souligné que, tous ces efforts n'ont d'intérêt que si les produits qui sont consommés à l'école sont réellement bons et flattent le goût. C'est la raison pour laquelle on a beaucoup compté sur la profession pour des choix judicieux, par des cahiers des charges adaptés. J'ajouterais que, depuis 2005, les distributeurs d'aliments et de boissons payantes sont interdits dans les établissements scolaires, mais nous allons expérimenter la possibilité de proposer exclusivement des fruits et légumes dans certains distributeurs, c'est une discussion qui n'est pas simple et qui évidemment n'est pas encore conclue.

Il y a également des actions au niveau des collectivités locales, car les collectivités qui sont proches des citoyens ont un rôle majeur à jouer. A été inventée la notion de Ville Active du PNNS et à ce jour, 140 villes et communes en France ont signé une charte permettant de les qualifier de Ville Active du PNNS avec toute une série d'actions possibles et on reviendra sans doute sur les aspects touchant les populations défavorisées. La connaissance est une chose; ensuite, il y a les questions de consommation. Pour essayer de faciliter la bonne compréhension du repère, des programmes courts ont été développés par l'INPES. D'autre part, les entreprises ont été invitées à s'engager dans un programme de charte d'engagement de progrès nutritionnel. C'est encore débutant, pour tout dire, il n'y a encore à ce jour qu'une seule entreprise qui a réellement signé la charte, mais nous ne perdons pas espoir de voir cette perspective se développer. J'ajouterais enfin l'importance de l'implication

des professionnels de santé et de leur sensibilisation à la question qui a été promue par le Ministère de la Santé.

Pour terminer, un petit mot sur la situation en 2008 : on peut dire qu'en France, les données de consommation montrent des évolutions qui sont plutôt favorables, en particulier la consommation de fruits frais ou transformés a augmenté chez les hommes; chez les femmes, pour les légumes et les soupes on est plutôt pour l'instant sur une situation de stabilisation mais on peut dire malgré tout que l'objectif fixé par le PNNS a été atteint par les adultes. Concernant la proportion de petits consommateurs de fruits et légumes, elle est tombée à 35%. Donc, on peut se féliciter que certains des objectifs fixés aient été atteints mais d'évidence, c'est un projet qui n'est pas terminé et nous sommes actuellement dans la phase de lancement du deuxième volet du PNNS. Il persiste évidemment toute une série de questions et en particulier celles qui sont abordées aujourd'hui, qui concernent les populations défavorisées que mon collègue Jean-Marc Bournigal va développer.

Voilà, je m'en tiendrai là simplement et je vous remercie de votre attention.

Q&A

PUBLIC (Mariano WINOGRAD - Président de 5/jour en Argentine) : Je vois que la politique a été décidée en 2004 selon ce que j'ai compris. La question c'est : quelle est la nouveauté après la croissance des prix des graisses et des céréales pendant les 2 années ? Je voudrais quelques opinions sur la situation actuelle parce que je comprends que toutes les décisions n'étaient prises quand le prix n'était pas assez haut comme c'est maintenant. Merci monsieur.

D HOUSSIN : Vous mettez le point là sur un événement qui nous préoccupe, parce qu'il touche en particulier les populations défavorisées : le prix des fruits et légumes. A ce stade, on est surtout attentif à ce que les initiatives que nous pourrions prendre à partir de maintenant ne soient pas contreproductives. En particulier, on est axé aujourd'hui sur les messages publicitaires à la télévision, en particulier à l'attention des enfants et sur l'éventuelle taxation de produits alimentaires qu'on pourrait considérer comme à éviter ou à, disons, ne pas recommander. On est aussi attentifs car, il ne faudrait pas que des initiatives prisent, se révèlent finalement défavorables par leur impact négatif sur la consommation des fruits et légumes. Jean-Marc Bournigal va pouvoir dire un mot sur ce sujet parce que cela relève plus de son domaine de compétence.

Oui, alors, il est évident qu'en France et plus globalement déjà, dans l'Union Européenne, on est particulièrement attentif à l'évolution des prix des denrées alimentaires. Je ne rappelle à personne que le défi qui est devant nous est pratiquement de doubler la capacité de production alimentaire de la planète d'ici, disons, les années 2050 et qu'à ce titre là, il convient peut-être de réfléchir plus globalement, je dirais, aux choix stratégiques qui ont pu être opérés pour gérer en termes de production agricole et en termes de politique agricole et probablement également de mener une réflexion au niveau mondial dans le cadre des éléments de régulation économique liés à l'organisation mondiale du commerce et à la place particulière que peut y occuper l'agriculture dans cette situation. Donc, il y a cette réflexion générale que nous devons conduire, et le Ministre de l'Agriculture français a déjà lancé le débat au niveau communautaire et je ne doute pas que beaucoup de ministères et beaucoup de ministres de l'agriculture à travers la planète vont être amenés à se poser des questions sur, justement, comment doit-on concevoir maintenant nos politiques agricoles face à ce défi qui est de pouvoir nourrir la population et éviter les famines, (...) en tout cas les manifestations de la faim dans une quarantaine de pays à travers le monde ne peuvent que nous interpeller.

Bien évidemment, cela a également des conséquences sur nos pays et sur le coût de l'alimentation dans nos pays. Donc là aussi, il y a des réflexions qui sont déjà en cours, plus globalement au niveau de (...) la façon dont on appréhende les choses de façon économique, c'est-à-dire qu'il y a une réflexion en France sur une amélioration de la concurrence sur la partie distribution pour diminuer le coût des produits. Et bien évidemment, cela pose le problème du pouvoir d'achat mais c'est lié à des politiques économiques un petit peu plus larges incluant des problématiques telles que comment peut suivre l'évolution salariale par rapport au risque d'inflation. Je ne sais pas s'il y a des réponses extrêmement simples; en contrepartie, ça pose un véritable problème pour les plus démunis, tout simplement parce que les populations les plus démunies dépendent encore aujourd'hui d'aide alimentaire relativement importante et que, bien évidemment, nous sommes plutôt dans des aides dont les montants sont plafonnés et que le surcoût de ces produits nous amène probablement à essayer de regarder budgétairement comment nous pouvons accompagner ces mouvements pour être capables, quand même, de continuer à distribuer ces denrées alimentaires. Donc là aussi il faudra également accompagner ces réflexions des conséquences sur les montants financiers qui sont consacrés à l'aide alimentaire dont une partie, bien sûr, va sur l'acquisition de fruits et légumes pour les populations les plus démunies. Donc, je n'aurai pas de réponse magique à apporter sauf que cette nouvelle situation impose probablement d'abord une réflexion sur la gouvernance mondiale et deuxièmement, interpelle pratiquement les structures ou la structuration économique de chacun de nos pays pour être capables de suivre. Ça touche effectivement beaucoup moins les populations aisées mais pour les populations les plus démunies, ça peut poser de véritables difficultés et ça ne va faire qu'accentuer la précarité. Si l'on regarde les chiffres, y compris en France, ces

populations sont plutôt, effectivement, en augmentation qu'en régression. Donc cela ne peut qu'interpeller les pouvoirs publics.

Juste quelques précisions par rapport à ces politiques gouvernementales : j'ai entendu vos experts parler de politiques cohérentes et structurées ; c'est vrai que la France a eu une démarche assez structurée en la matière dans la mesure où elle a mis en place un plan (...) national nutrition santé qui associe la totalité des partenaires. On en est déjà à la deuxième version, ce qui veut dire que nous essayons d'avoir une vision coordonnée de l'ensemble de nos actions, à travers un diagnostic partagé des difficultés rencontrées, des capacités d'action de chacun des acteurs. Donc pour le Ministère de l'Agriculture, notre implication dans ce champ-là est relativement claire. Le Ministère de l'Agriculture, enfin en tout cas en France et je pense que c'est un peu le cas dans la majorité des pays du monde, maîtrise ce que l'on appelle l'offre alimentaire au sens général et la politique de l'alimentation telle que nous la voyons du côté français c'est d'être capable de pouvoir offrir au consommateur une alimentation sûre, saine, de qualité, diversifiée et de qualité nutritionnelle, et bien sûr accessible. Donc une fois qu'on a dit ça, cela implique qu'il faut se pencher sur la totalité des leviers d'actions dont peut disposer un Ministère ; on peut travailler sur la sélection végétale pour améliorer le contenu nutritionnel des produits, pour améliorer son goût. On peut travailler sur les organisations de filières et les circuits économiques. On peut travailler aussi bien sur la formation des prix que sur l'accessibilité des fruits et des légumes en aidant la transformation, en aidant la recherche et ainsi de suite. On peut aussi, bien sûr, contribuer derrière, jusqu'au consommateur final à travers les systèmes de logistique de façon à ce qu'ils soient adaptés. C'est donc un peu la spécificité de l'articulation du Ministère de l'Agriculture dans ce programme. Nous contribuons donc, par rapport aux objectifs qui ont été fixés dans le PNNS, à des mesures de prévention qui tournent autour de l'offre alimentaire.

Le diagnostic, je pense que tout le monde a dû en parler largement pendant ces quelques jours du Sommet, nous allons faire face à une double fracture. Une fracture générationnelle où nous observons quand même que les jeunes enfants mangent nettement moins de fruits et légumes qu'avant et là, Didier Houssin a déjà largement indiqué qu'il faut passer par une éducation, et une formation des jeunes qui est extrêmement importante, pas dans l'idée de leur apprendre, combien de protéines, combien de pourcentage de différents nutriments il faut manger, mais plutôt une éducation sensorielle, une éducation au goût pour leur donner le goût des fruits et légumes, des messages relativement simples et surtout des messages qui sont en phase avec, je dirais, la vision gastronomique que peut avoir la France qui inclut, non seulement bien sûr, la notion d'équilibre nutritionnel mais l'associe, à tout ce qui va avec, c'est-à-dire le plaisir, la convivialité, puisque c'est quand même le choix qui a été opéré dans le cadre du PNNS de ne pas diaboliser un aliment par rapport à un autre. Dans toute cette dimension éducation il y a quelques chose qui est mené, tambour battant, au niveau de l'éducation nationale à travers différents programmes

qui sont menés d'ailleurs avec l'appui de chercheurs, l'INRA a beaucoup investi d'ailleurs sur ces domaines-là.

Le deuxième élément qui est effectivement plus difficile à appréhender, c'est la fracture sociale où il est évident que toutes les études ont montré très clairement que parmi ces populations les plus démunies, on a observé d'une part les cas les plus élevés de dénutrition, et d'autre part des cas d'obésité ; ce qui prouve que l'action que l'on doit mener sur ces populations doit voir l'équilibre nutritionnel être au cœur des préoccupations des pouvoirs publics en la matière. Pour toucher ces populations les plus démunies, l'évidence, outre le fait qu'elles ont des difficultés de pouvoir se fournir en alimentation en quantité et bien sûr en qualité par rapport à leur revenu, le système français passe par un système d'aide alimentaire qui repose déjà sur une aide communautaire plus une aide nationale et une mobilisation des industriels de l'agroalimentaire et des différents citoyens sous forme de dons, ce qui permet d'avoir environ 120 millions d'euros consacrés à l'aide alimentaire en France pour pouvoir alimenter 2,6 millions de personnes. Un facteur qui est un peu plus en augmentation qu'en régression.

Les politiques françaises s'appuient essentiellement sur les associations caritatives qui assurent l'accueil des bénéficiaires et la distribution des aliments ce qui signifie bien sûr un recours au bénévolat. C'est une originalité du système français et les pouvoirs publics doivent en tenir compte.

Il faut en permanence savoir s'adapter aux différentes catégories des populations bénéficiaires parce que lorsqu'on parle de plus démunis on va effectivement des personnes qui sont sans domicile fixe et qui sont en marge complète de la société jusqu'aux travailleurs pauvres qui sont encore insérés dans la société mais dont la situation devient extrêmement précaire et il faut être capable d'accompagner l'ensemble de ces populations dans des circuits qui sont relativement différents. Ça passe aussi bien par des colis, des repas servis, jusqu'à des notions d'épicerie solidaire, qui sont des modes de distribution où les gens continuent à être insérés socialement dans le choix des aliments qu'ils peuvent acheter mais avec des prix qui doivent tourner autour de 20% des prix des produits que l'on peut trouver dans le commerce; et l'ensemble de ces associations caritatives permettent également d'accompagner les bénéficiaires, au-delà de la simple distribution alimentaire, en donnant du conseil mais également, d'autres types de services qui vont jusqu'à des actions visant à impliquer les bénéficiaires (cours de cuisine etc ...).

Par rapport à ce schéma, l'implication du Ministère de l'Agriculture, en lien avec la Direction Générale de l'action sociale, est plus particulièrement axée sur l'organisation de ce traitement particulier qu'est l'aide alimentaire. De nombreuses actions ont été menées.

Une première pour améliorer l'équilibre nutritionnel de ce qui est distribué, une action que le Ministère de l'Agriculture est en train de lancer, c'est la distribution de fruits et légumes, plutôt de fruits d'ailleurs parce que les légumes ça marche un peu moins bien à la récré, (surtout si c'est des poireaux ! ...) en dehors des repas, non seulement pour contribuer à améliorer la compréhension ou en tout cas le jugement

que portent les jeunes sur les fruits mais également en l'accompagnant d'opérations de soutien pédagogique qui visent à mieux insérer ces fruits dans le quotidien des jeunes enfants et la première opération qui va être lancée dès la rentrée prochaine visera de façon très prioritaire les Zones d'Education Prioritaires, là où l'on rencontre les familles les plus démunies en nombre beaucoup plus importants. Ce système aura pour vocation d'être généralisé dans l'ensemble des écoles françaises, nous travaillons au niveau communautaire sur la possibilité d'avoir des financements pour aller dans ce sens.

D'autres actions visent à mieux acheminer ou en tout cas distribuer les fruits en cas de crise. Une expérience intéressante a été menée au niveau d'un marché d'intérêt national qui se trouve juste en dehors de Paris qui a permis à travers une meilleure gestion logistique mais aussi une meilleure articulation entre les associations caritatives et les différents producteurs de fruits et légumes de valoriser les invendus ou les produits qui le seraient presque. Et à travers une meilleure articulation des acteurs, chaque jour c'est plus de 1,5 tonne de fruits et légumes qui sont récupérés sous forme de dons. Et plus de 3,5 tonnes de fruits et légumes qui sont récupérés avec des coûts d'achat préférentiels. Et ces fruits et légumes sont ensuite dirigés à travers une réflexion logistique permettant d'aller soit directement vers des transformations qui iront ensuite abonder les circuits de distribution, soit directement livrés en frais dans les circuits de distribution pour les aides aux plus démunis.

Maintenant une réflexion beaucoup plus générale en France est engagée pour aller vers une optimisation de la gestion de ces marchés car la déperdition quantitative est extrêmement importante un peu partout dans le pays. Soit à travers les circulations normales des produits ou à travers les épisodes ponctuels de crises où il y a des retraits de produits, si on n'est pas très bien préparé en termes de logistique il y a encore des phénomènes de déperdition majeurs en cas de crise. C'est donc un premier axe de réflexion qui est en cours et qui a déjà commencé à donner des résultats.

Deuxièmement, nous sommes également impliqués, avec la Direction générale de l'action sociale, pour améliorer la qualité organoleptique des produits. On s'est quand même aperçu que sur beaucoup de produits transformés, c'est-à-dire des produits dédiés à ces circuits un peu particuliers, l'aspect gustatif organoleptique n'était pas tout à fait au rendez vous ce qui pouvait expliquer également un certain désintérêt, même de ces populations démunies, sur les fruits et légumes, leurs modes de présentation ou les recettes qui pouvaient leur être proposées n'étaient pas non plus à la hauteur de leurs espérances. Donc, là aussi nous allons travailler sur l'amélioration gustative de ces produits en travaillant avec des unités un peu plus dédiées qui existent dans certains établissements d'enseignement agricoles du Ministère de l'Agriculture.

Enfin, on intervient également pour améliorer la connaissance des plus démunis en termes l'équilibre alimentaire et les connaissances des terroirs parce qu'on s'aperçoit que même si on réussit à avoir l'aide économique, même si on réussit à trouver des

fruits et des légumes, souvent ces familles les prennent mais ne les consomment pas, voire ne les prennent pas du tout. Soit parce qu'ils estiment que ces produits doivent être transformés ce qui engendre un effort particulier et ils ne sont pas prêts à le faire, soit parce qu'ils jugent que c'est peut être moins valorisant socialement que des produits plus rapidement prêts à l'emploi qui sont quand même beaucoup plus mis en avant dans la présentation extérieure de l'alimentation. Ce qui nécessite là encore des réflexions sur comment faire passer des bons messages à travers les circuits existants en dehors de l'école. Là aussi nous sommes engagés dans deux projets pour augmenter la consommation de fruits et légumes chez les plus particuliers, d'abord à travers le développement de modules de formation et d'éveil sensoriel mais également l'élaboration d'outils d'animation pour que les bénévoles et les salariés des associations caritatives ou des épiceries solidaires aient les moyens de communiquer au quotidien avec les populations défavorisées et aussi la capacité d'animer des ateliers pour leur donner un petit peu de culture culinaire pour valoriser, justement, à leurs yeux les fruits et légumes. Ce sont des actions qui mobilisent l'Etat et auxquelles est associée également toute la profession puisqu'une partie de ces actions voient aussi la mobilisation d'INTERFEL, d'Unilet pour la partie transformée mais également de la fondation Bonduelle et associent les associations caritatives telles que les épiceries solidaires et également le Secours Populaire Français. Aussi ce travail pédagogique me semble extrêmement important et bien évidemment derrière il y a d'autres programmes, j'en ai parlé un tout petit peu sur les histoires de logistique, de stockage, de guide de bonnes pratiques sur l'hygiène et la sécurité sanitaire de ces produits parce que nous sommes dans des circuits où il y a beaucoup de bénévoles et il faut aussi là s'assurer que les produits qui arrivent jusqu'à ces populations démunies soient bien évidemment aussi sains et sécurisants que possible.

Donc voilà quelques éléments qui structurent notre volonté, au moins sur la partie des plus démunis. Je crois que Didier Houssin a déjà parlé des autres éléments. On peut bien sûr intervenir sur la qualité nutritionnelle dans les cantines des enfants ce qui est déjà en cours entre nos deux administrations et sur une réflexion un peu plus globale sur la valeur nutritionnelle des produits mis sur le marché à travers la notion de charte d'engagement volontaire de différents industriels soit à titre individuel soit collectif qui bénéficierait ensuite d'une reconnaissance dans le cadre du PNNS, des actions qu'il pourrait y avoir sur la qualité nutritionnelle de leurs produits. Une qualité nutritionnelle, ça veut dire soit une réduction de la valeur énergétique à travers une réduction en termes de glucides ou une augmentation de glucides complexes, à travers aussi bien les lipides mais également sur la communication, sur la présentation, sur la taille des doses. Donc ces éléments-là sont articulés comme vous l'avez compris, dans un plan un petit peu général, nous discutons tous ensemble les différentes démarches que nous allons enclencher pour donner du sens ; et puis derrière, ce qui est un petit peu plus difficile, c'est la façon dont on mesure tout ça. Ce n'est pas exactement simple. Peut être que Didier pourrait préciser un petit peu ce qu'est la façon dont on peut mesurer l'impact sur la population je dirais en termes de mesure de l'obésité d'un côté. D'un autre côté on

peut avoir des séries d'indicateurs sur chacune des actions que l'on mène de façon à mesurer son efficacité que ce soit en termes logistique, quantitatif, acceptation par les consommateurs ou sur les chartes d'engagement car nous avons mis en place un observatoire de la qualité des aliments en France qui nous permettra de suivre l'amélioration du contenu nutritionnel des aliments dans ce pays qui sera, là aussi, un indicateur où nous pourrions collectivement voir ce que la ménagère achète et la qualité nutritionnelle, en tout cas l'amélioration de celle-ci dans le panier moyen des ménagères.

Voilà quelques éléments.

Q&A

PUBLIC : M. Houssin, les champs de surveillance sur la notion de l'obésité ?

D HOUSSIN : Il y a effectivement des systèmes qui permettent de mesurer les indicateurs d'impact sur la nutrition en particulier la prévalence de l'obésité. Il y a d'ailleurs en France des résultats qui sont plutôt encourageants sur l'obésité concernant les jeunes enfants, en revanche sur les adultes on n'atteint pas encore une évolution qui puisse être considérée comme positive.

PUBLIC : Une question assez basique, quand il s'agit de l'obésité, quelle est votre estimation de la responsabilité du gouvernement ? Et celle de l'industrie agroalimentaire ?

D HOUSSIN : Ecoutez, je crois que c'est un phénomène qui évidemment est tout à fait multifactoriel et donc on ne peut certainement pas décharger de leurs responsabilités ni l'industrie ni l'Etat. Maintenant, la part respective des deux est certainement difficile à apprécier. Ce qu'on peut dire simplement c'est que la force de frappe de l'industrie est très grande, à travers la publicité, les moyens engagés dans la publicité. Comparativement, les moyens mis en œuvre par l'Etat sont certainement moins importants mais c'est vrai que l'avantage de l'Etat, en particulier en France, c'est qu'il a la possibilité d'étendre son action assez loin dans la société à travers une organisation qui est finalement assez centralisée et qui laisse peu de prise à des comportements qui seraient totalement divergents de telle ou telle région par exemple. Je ne peux pas dire que nous soyons à armes égales mais malgré tout l'Etat n'est pas totalement démuné et le programme National Nutrition Santé est sans doute une traduction de cette capacité d'engagement. Alors ensuite, le jugement se fera plus tard.

PUBLIC (M. SALLES) : M. Bournigal, vous parlez de donner du sens et quelques instants auparavant M. Houssin parlait du prix des fruits et légumes qui est un obstacle, ce qui a nourri la thèse que les fruits et légumes sont chers. J'aimerais beaucoup que l'on travaille, plutôt que de vulgariser cette idée-là et d'accréditer cette thèse-là, au traitement de ce que pourrait être la phénoménologie du prix comparée à la valeur alimentaire que nous sommes en train de mettre en exergue justement tout

au long de ce congrès et des précédents de telle manière que le sens qui est celui que nous souhaitons réellement porter soit objectif, ce qui n'est pas le cas. Car quand on dit que les fruits et légumes sont chers, à mon avis, tant qu'on n'aura pas tiré des conclusions de ce que pourrait être une valeur alimentaire comparée entre ces produits là et d'autres produits de la consommation.

D. HOUSSIN : Je trouve que votre remarque est tout à fait intéressante car il est vrai qu'on a sûrement à travailler sur cette question du sens des mots et du sens accordé à certains prix. J'avais été frappé en matière d'alcool sur le fait que là aussi il y avait des notions de perceptions selon la taille des verres entre la quantité d'alcool et la taille des verres et je crois qu'on devrait peut-être travailler plus sur... J'entends le message.

JM BOURNIGAL : On sait bien que c'est quelque chose auquel la filière est extrêmement sensible. C'est vrai qu'en termes de prix, c'est en fait la perception qu'on en a qui est importante. C'est vrai que là, on a déjà des discussions en France, pour voir ce que ça veut dire. Les fruits et légumes sont chers ça ne veut pas vraiment dire grand-chose. C'est savoir un petit peu en valeur relative, ce que ça représente entre un enfant qui trouve qu'une barre chocolatée, ce n'est pas cher, il va trouver qu'une pomme est chère même si elle est trois fois moins chère que la barre chocolatée. Après c'est en terme de fonctionnalité où la fonction de plaisir intervient... Mais c'est vrai qu'on ne peut pas non plus nier que quelque part quand on fait des analyses techniques ou scientifiques sur les freins à la consommation on entend souvent parler du prix. Donc ça veut dire que c'est quelque chose qu'il faut aussi appréhender, des réflexions sont en cours déjà en France sur le fait que les fruits et légumes sont souvent vendus au poids et pas à l'unité, ce qui fait qu'on n'a pas les mêmes perceptions de ces produits. Ces notions de prix, donc, et surtout la perception que l'on peut en avoir par rapport à une fonctionnalité nutritionnelle c'est quelque chose qui mérite encore probablement d'être creusé pour pouvoir trouver la façon de le présenter peut être différemment que de simplement dire : "c'est trop cher ". En tout les cas, c'est une véritable réflexion à mener.

PUBLIC (M. SALLES) : Permettez moi de ré-insister et de nier ce que vous venez de dire M. Bournigal, c'est trop fondamental, c'est trop fondateur pour qu'on botte en touche sur cette question-là et il est essentiel que l'on traite cet aspect des choses si on veut agir réellement. Donc si nous sommes d'accord pour dire les choses de cette manière-là en dehors de toute autre diplomatie, ce que j'ai tenté de faire au départ, nous sommes complètement d'accord.

JM BOURNIGAL : Pas de divergence, je dis simplement que c'est très réducteur de dire que c'est le prix. Ce n'est pas comme ça qu'on devrait présenter les choses et il est peut-être nécessaire justement dans la présentation de trouver, des éléments plutôt liés à la fonctionnalité ou au rôle nutritionnel.

PUBLIC (M. SALLES): C'est quand on parle de la pauvreté, ça me dérange toujours quand on lit une des solutions à la pauvreté qui est une réalité terrible qui nous touche tous et que l'on lie le seul problème du manque de fruits et légumes, le prix des fruits et légumes à la notions de pauvreté, c'est toujours très particulièrement gênant. Il y a des gens qui l'entendent comme ça, vous avez probablement lu le Figaro hier, qui est un véhicule d'information essentiel, qui fait un écho à ce sommet aujourd'hui en titre des pages économiques qui dit : « les fruits et légumes, plus chers de 5,5% » premièrement et en pages intérieures « une désaffection du public qui s'accroît ». Je pense que nous avons à lutter contre cela, il faut donc être rigoureusement prudent.

Je crois qu'en effet c'est très réducteur que ne parler que du coût mais d'un autre côté il ne faut pas exclure cette notion que le coût est un élément tout de même important et une des barrières, et un des freins à la consommation des fruits et légumes même si ça n'est pas le seul.

E BRUNNER: It is fascinating, listening to the French debate (...) and I want to ask you a simple question which is: have you adopted in France a minimum wage? And do you have a way of estimating minimum income for healthy living in different age groups, for example, including those who are retired?

PUBLIC (M. SALLES): (...) Je ne suis pas sûr qu'en France on est fait le travail que vous avez fait sur les inégalités de santé. C'est d'ailleurs un des projets qu'on a dans le cadre de la révision de la future loi de santé publique. C'est de se doter d'indicateurs (...) dans la ligne de ceux que vous avez adoptez concernant la manière de s'adresser à la question des inégalités de santé. Je dois dire qu'on a fixé, dans la loi de santé publique, des indicateurs de santé mais qui ne sont aujourd'hui ne mon point de vu pas assez reliés à la notion d'inégalité d'accès à atteindre ces indicateurs selon le niveau socioéconomique.

PUBLIC (journaliste) : Ma question concerne les maladies que vous n'avez pas citées notamment les maladies de dos par exemple, les maladies des os qui ne sont pas forcément liées à l'obésité mais à autre chose. Je ne sais si un médecin pourrait nous expliquer à quoi c'est dû, parce que beaucoup de gens, notamment en France, en souffre énormément.

D. HOUSSIN : Il y a énormément de pathologies liées à la nutrition, toutes ne sont pas liées. La nutrition n'est qu'un facteur parmi d'autres dans un certain nombre de maladie. Alors, lorsque vous avez dit, il y a des troubles de minéralisation osseuse sur lesquelles il y a des rôles de facteurs nutritionnels mais sur les maladies du dos d'une façon générale il y a beaucoup d'autres facteurs qui interviennent. On vous donnera si vous voulez des informations très précises sur ce que l'on sait aujourd'hui des relations alimentation-santé car il y existe dans la littérature maintenant des ouvrages qui permettent de faire une synthèse assez complète sur ces relations.

PUBLIC (Valérie GUITTET de la ligue contre le cancer en Loire Atlantique) : Cela fait 2 jours qu'on a démarré la semaine Fresh'Attitude initiée par l'organisation APRIFEL. J'interviens depuis 4 ans à la ligue mais c'est la première fois que j'interviens dans les quartiers défavorisés. Et il me semble que la demande principale, c'est celle du lien social. C'est-à-dire que la population n'est pas forcément en demande, j'allais dire d'information santé, qu'elle veut surtout de l'échange de qualité, il s'avère qu'il y a de moins en moins de lieux de ventes sur certains sites et notamment des quartiers. Ils disparaissent, il faut le dire franchement, donc là il y a déjà en effet des solutions à trouver sur les échanges puisque c'est la demande principale en fait de ces populations. Que pensez-vous de la problématique de la formation des diététiciens et diététiciennes ? Je suis actuellement des jeunes qui passent des BTS Diététiques et qui se retrouvent sans débouchés à la fin des 2 années. Apparemment il y a une problématique d'emploi derrière et pour autant couplée à une formation éducation à la santé, je trouve que ces jeunes seraient de véritables relais pour faire passer les messages nutritionnels, peut être dans un contexte d'école, peut être en parallèle avec infirmières scolaires, médecins scolaires, qu'est-ce que vous en pensez ?

Sur les diététiciens c'est sûr que dans le cadre du programme nutrition santé il y a un volet qui se centre sur cette profession. La question de l'adéquation de la quantité de personnes formées aux capacités d'emploi n'est pas spécifique au domaine de la nutrition. On retrouve à peu près le même problème en matière de psychologie par exemple. C'est sûr que le monde hospitalier s'est doté de diététiciens, de diététiciennes, il est sûr que cette évolution n'a pas encore touché en particulier le secteur, je dirais, des soins de premiers recours. Or on peut imaginer que dans l'avenir dès lors qu'on serait plus attentif à la notion de prévention en particuliers pour les soins primaires et de premiers recours que le diététicien, la diététicienne, trouve sa place assez naturellement comme le kinésithérapeute ou le psychologue et l'infirmière évidemment. Je crois que cette une perspective mais qui d'évidence en France n'est pas encore assez développée.

PUBLIC (Réseau de Prévention d'Obésité Pédiatrique) : Juste pour rebondir sur ce qui a été dit au niveau des diététiciennes qui sont en effet vraiment demandeuses le problème qu'elles soulèvent, je ne suis pas diététicienne moi-même, je vais quand même me faire leur porte-parole parce qu'en France en tout les cas le souci des diététiciennes en particulier pour intervenir dans ce genre de population c'est que ce n'est pas remboursé par la sécurité sociale et je pense qu'en effet c'est vraiment le grand souci et que ces gens là serait vraiment un très bon relai. Avez-vous une vision sur un éventuel remboursement des consultations diététiques ?

D. HOUSSIN : C'est un problème de fond que vous posez qui depuis le début du PNNS est d'actualité. C'est vrai qu'on y réfléchit, des choses ont quand même évolué puisqu'il y a une reconnaissance du métier de diététiciens qui était déjà une première étape. A la fois, qui permettait d'avoir une formation mieux adaptée, qui va être en cours d'élaboration et d'autre part une reconnaissance du métier qui débouche sur

un décret d'actes qui devrait permettre, à terme, d'obtenir des remboursements. Donc, ceci est dans les tuyaux, c'est extrêmement complexe, vous imaginez, mais c'est quelque chose qui fait partie des aspects prévus au niveau de l'administration.

PUBLIC (d'Argentine) : M. Bournigal a parlé du rôle des marchés d'intérêt national pour la logistique, pour le fournissement des populations moins favorisées. Les marchés d'intérêt national dans les années 50 a eu un rôle beaucoup plus important, après ça, dans toute l'Amérique Latine, on copié presque le modèle français, au moins au Brésil et en Argentine et alors le marché central comme on l'appelle le Ceas au Brésil ont eu un rôle central, après ils ont perdu. Maintenant il est nécessaire que nous discussions le besoin de presque dupliquer la consommation des fruits et légumes. Pensez vous que les grossistes auront un rôle central dans ce défi qu'on a ? Peut on imagine encore une fois un rôle qu'ils ont perdu maintenant ?

JM BOURNIGAL : C'est difficile vous répondre. Cela dépend vraiment des circuits de distribution et je crois que chaque pays a développé ses propres logiques d'approvisionnement. En France vous avez une dualité entre des hypermarchés dans des structures commerciales extrêmement grandes qui ont des circuits de distribution avec des plateformes intégrées qui sont ravitaillées en très grande quantité. Ensuite vous avez un réseau dans les villes de points de ventes de fruits et légumes qui sont effectivement plus petits. Donc coexistence en France d'un système qui est adapté à notre mode de distribution, probablement des très gros grossistes qui sont capables de ravitailler tout le monde, des petits grossistes qui sont plutôt spécialistes du système de proximité. L'intérêt des marchés d'intérêt national c'est parce que c'est une spécificité française qui a été reprise effectivement dans d'autres pays, c'est qu'on a à un certain endroit de très grandes quantités d'aliments qui permettent, sur ces point là de ravitailler assez largement des structures de petites tailles. Et dans l'aide au plus démunis, c'était simplement comment on pouvait réfléchir parce qu'il y avait une déperdition quantitative de produits qui était assez importante comment est-ce qu'on pouvait éviter cette déperdition et pouvoir utiliser cette quantité de produit au bénéfice des plus démunis. Maintenant par rapport aux besoins futurs, je pense que la natalité française n'augmente pas énormément en tout les cas pas pour faire bouger tout nos circuits de distribution. Je ne suis pas sûr que cela aurait un gros impact si on doit nourrir le reste du monde, ça sera surtout la logistique internationale qui sera touchée, la logistique internationale française a déjà quand même assez évolué, elle peut encore s'améliorer mais elle est déjà quand même assez évolué.

J'essaie depuis un certain nombre d'années de suivre vos travaux parce que je crois qu'il est particulièrement important que les hommes et les femmes de science, de réflexion et de santé publique que vous êtes se mobilisent sur ce sujet. Longtemps nous avons cru, jusqu'à il y a quelques années, que les problèmes de nutrition étaient réglés dans nos pays développés, que finalement il n'y avait qu'à laisser faire les choses, le marché. Et puis on s'aperçoit que les choses sont plus compliquées, déjà au niveau de la planète, on l'a bien compris très récemment. Elles sont aussi plus compliquées dans nos pays développés où nous avons à nous interroger sur la qualité de notre nutrition, et sur l'absence de nutrition : les famines de l'histoire européenne du moyen âge mais aussi même encore dans certaines régions au 19^{ème} voire au 20^{ème} siècle dans les périodes de crises, ont été des questions dramatiques pour la santé de nos concitoyens, pour la santé des européens, pour la santé des humains. Nous savons aujourd'hui que les problèmes de qualité alimentaire, c'est-à-dire d'équilibre nutritionnel, posent aussi un certain nombre de questions de santé publique tout à fait essentielles. Nous sommes donc invités, vous les scientifiques, et nous les politiques, à nous réinvestir dans cette question qui nous semblait finalement comme aller de soi. Cela ne va pas de soi.

Alors, je crois que nous avons quand même beaucoup progressé depuis un certain nombre d'années, et je voudrais dire que, personnellement, je me retrouve tout à fait dans les grandes orientations qui ont été dessinées devant vous tout à l'heure sur l'action de la France. Il y a indiscutablement une réflexion assez complète à la fois sur les grands principes qui doivent conduire une politique de nutrition, et sur un certain nombre de propositions d'actions dans différents domaines aussi nombreux, aussi subtiles que ceux qui ont été définis avant moi par les animateurs de cette table ronde. Et en même temps on ne peut pas ne pas s'interroger sur l'impact sur les politiques publiques. C'est-à-dire qu'indiscutablement il y a un décalage certain entre la prise de conscience d'une certaine élite, excusez moi, politico-scientifique et puis la réalité. Ceci est d'autant plus anormal que, depuis que nous sommes un certain nombre de scientifiques, politiques et responsables administratifs à intervenir sur ces questions, nous avons bénéficié pour beaucoup d'un assentiment du public c'est-à-dire qu'il y a une vraie sensibilité dans la population, à ces questions. Et beaucoup de nos concitoyens sont tout à fait persuadés, finalement, que la question est d'importance, que la situation mérite des actions assez fortes, qu'il y a des problèmes de santé publique qui ont à voir avec la nutrition, même s'ils n'en tirent pas forcément toujours pour eux-mêmes des conséquences immédiates. La conscience d'un problème ne suffit évidemment pas à avoir une attitude ni individuelle ni collective positive. Mais, en tout état de cause, on ne peut pas dire qu'on n'intéresse pas le public et qu'on n'est pas soutenu par l'opinion publique. J'ai, moi, le sentiment tout à fait du contraire. Et pourtant on peut quand même trouver légitimement qu'il y a un décalage entre ce que nous pensons, ce qui est demandé et ce qui se fait. C'est-à-dire qu'au milieu de tout ça, les politiques industrielles, les administratifs, les

habitudes, sont difficilement réformables. Alors, on a des intentions qui sont souvent louables, mais arrivé sur le terrain, elles ont du mal à se mettre en place. C'est vrai par exemple de l'Education Nationale en France. On voit qu'il y a beaucoup d'intérêt, y compris chez les enseignants, mais on ne voit pas complètement une politique aussi volontariste que nécessaire et aussi volontariste que souhaitée, se mettre en place. Il y a beaucoup de discussions, on s'interroge sur la restauration scolaire, sur la place de l'apprentissage de la nutrition à l'école. Pour supprimer des distributeurs automatiques de soda dans les lycées, il a fallu batailler pendant plus de 2 ans et demi sur une mesure qui est, on va dire, quand même assez secondaire en France. Je sais qu'elle serait plus lourde encore à prendre aux Etats-Unis. Mais en France, on n'était pas encore complètement entouré par cette question et pourtant il a fallu batailler et ça été très long : 2 ans et demi de bataille pour ça, c'était quand même difficile.

Dans les politiques municipales aussi, plus globalement au plan local, (...) il y a des initiatives qui sont prises ici ou là mais qui sont très loin d'être généralisées. Dans les politiques publiques, les arbitrages en matière de publicité vis-à-vis de l'industrie agroalimentaire sont des arbitrages douloureux. Pas simplement vis-à-vis de l'industrie agroalimentaire mais aussi vis-à-vis du monde des médias où les médias à l'évidence qui vivent des substrats publicitaires continuent à opposer une résistance farouche à toutes les évolutions qui verraient une modification importante visant par exemple à supprimer des écrans publicitaires pour certains produits à certains moments en tout cas en direction des enfants. Et donc là, on attend toujours que des décisions toujours annoncées mais souvent reportées soient véritablement mises en œuvre. Et puis, il y a tout le problème de la filière économique des fruits et des légumes car, on aura beau dire tout un tas de choses, il est exact que nos concitoyens perdent l'habitude de consommer des fruits et des légumes pour de nombreuses raisons qui ont déjà été analysées ici mais qui quand même ont une cause première. C'est quelque part que les fruits et les légumes pour l'essentiel, ne sont pas dans le système (...) économique dominant de notre économie de marché. En d'autres termes, ce n'est pas une industrie très capitalisée et elle a peu de capacité de concentration, peu de capacité d'industrialisation, peu de capacité de recherche et développement, peu de capacité de publicité.

Après, on a le débat sur les prix. En plaisantant, je disais, je vais vous offrir un petit opuscule qui est maintenant assez peu cher qui s'appelle « salaire prix et profit » qui doit dater de la moitié du 19^{ème} siècle et qui vous donnerait quelques réponses. C'est-à-dire que comme vous n'êtes pas dans le courant dominant de l'économie de marché votre prix finalement acquiert – le prix c'est une fiction, ce n'est pas toujours une valeur d'usage (...), c'est une valeur d'échange et dans cette valeur d'échange le prix de quelque chose qui n'est pas dans le courant dominant de l'économie (...) a moins de valeur que quelque chose, qui est dominant. Pourquoi acheter une montre qui va simplement me donner l'heure alors que j'ai actuellement ici l'heure sur mon téléphone et que je vais payer très cher, alors que des fruits et des légumes m'apportent non seulement la nutrition nécessaire à mon activité mais en plus m'apportent quelque chose pour la santé ce qui n'est pas du tout le cas de cette montre ? Nous sommes donc pris dans un système global qui va bien au-delà de ce

que peuvent dire les médias sur le fait que les prix sont chers ou qu'ils ne sont pas chers et qui va bien au-delà de ce que nous pouvons faire pour améliorer encore l'accessibilité des fruits et des légumes vis-à-vis du public. Je pense qu'en développant l'idée que les fruits et les légumes sont des éléments majeurs de la santé publique (...) on peut dire que nous relativiserons (...) le prix de ces produits. Aussi, Il n'est pas (in)intéressant de savoir comment ces produits sont produits, sont fabriqués, comment ils sont distribués et par qui ils sont vendus, ce n'est pas quelque chose qui est inintéressant et si on veut être conséquent, il faut effectivement que les pouvoirs publics se posent un certain nombre de questions sur ce type de sujet. C'est vrai, ces questions alimentaires se posent dans des pays qui aujourd'hui sont au bord de la famine, on pense notamment à l'Afrique, et on voit comment un certain nombre de pays doivent reconquérir des cultures vivrières pour assurer leur équilibre alimentaire et que ce n'est pas simple, que cela ne se fera pas si facilement que ça et si rapidement que ça. Mais nous voyons bien aussi comment nous-mêmes nous devons nous réapproprier, complètement, des circuits de production et de distribution. Par exemple, il est vrai qu'à Paris, qui est pourtant une ville qui ne manque pas de commerce, ni de pouvoir d'achat pour l'essentiel, en tout cas dans la plupart des quartiers (...) on voit qu'il y a beaucoup de succès sur ce qu'on appelle les circuits courts de productions de fruits et de légumes et qu'on voit, par exemple je crois, il y a 15 jours au centre de Paris, dans le 5^{ème} arrondissement il y a avait une action qui était portée par des coopératives agricoles de gens qui venaient vendre directement des produits fruits et légumes, et ça a eu un grand succès. Il va falloir qu'on se pose des questions parce que ça a eu un grand succès, y compris pour marquer les esprits. En même temps et à contrario on se dit : est-ce que nous allons continuer, nous qui défendons les fruits et légumes, à légitimer le fait que – je n'ai pas le dernier mot en matière d'économie agricole, je pose des questions je ne prétends rien d'autre - mais est-ce qu'on est certain que ce nous faisons, c'est-à-dire d'essayer de vendre des fruits et des légumes où nous vendons par exemple des fraises au mois de décembre à Paris qui sont fabriqués par exemple dans un pays au sud de la méditerranée qui ponctionne, peut être, je ne sais pas, la nappe phréatique, les besoins en eau de ce pays d'une façon considérable qui ne résout certainement pas les problèmes alimentaires du pays en question, est-ce que nous agissons bien ? Pas simplement d'un point de vue écologique mais lorsque l'on fait de la santé publique de façon soutenable, est-ce qu'on n'est pas amené à se poser la question dans sa globalité ? Et quand je dis ça, il m'arrive de manger des fraises au mois de décembre, je ne jette la pierre à personne en disant ça, nous avons donc à nous réapproprier peut-être une nouvelle lecture, encore peut-être plus radicale, peut-être que je me trompe, peut-être qu'il faut continuer à faire ce que nous faisons mais peut-être aussi qu'il faut avancer vers une lecture encore plus radicale, une critique plus radicale des modes de production et de distribution que nous avons mis en œuvre. Et ces questions, elles sont posées, au niveau de l'Etat bien sûr et, au niveau européen ça doit être une des réflexions majeures de la politique agricole commune. Vous connaissez tous, je pense, même ceux qui ne sont pas européens, la politique agricole commune et donc les questions qui sont posées. J'espère, ce n'est pas mon secteur d'intervention premier, mais j'espère que la politique agricole commune saura se hisser à ce niveau

de questionnement et qu'on ne se limitera pas à quelques faux-semblants du genre faire du maïs pour faire du biocarburant. Cela serait quand même, surtout dans nos pays (...), dramatique qu'on escamote les problèmes agricoles sous prétexte d'ailleurs que le niveau des prix augmente au plan international, c'est un fait pas simplement des fruits et des légumes mais de tous les produits alimentaires, et que à partir de là, on pourrait être amené, les producteurs, seront peut être amenés à se poser moins de questions qu'ils ne se posaient lorsqu'ils étaient dans une situation de difficultés financières. Donc vous voyez, qu'au total, nous sommes dans des questions très politiques parce que c'est par un retour très paradoxal du politique, me semble-t-il, pour des questions de santé publique d'abord, pour des questions éventuellement d'aménagement du territoire parce que s'agissant de ces produits là, en France, nous sommes très sensibles à ces questions d'aménagement du territoire. Donc des questions de santé publique, des questions d'aménagement du territoire, des questions de pouvoir d'achat diraient les pouvoirs publics, des questions aussi de systèmes de distribution et donc par exemple d'organisation de la ville, je ne suis pas certain que nos problèmes alimentaires ne posent pas quelque part, pour partie, des problèmes d'organisation du fonctionnement de nos villes. De la même façon que la crise énergétique pose évidemment des problèmes de fonctionnement de nos villes, mais est-ce que nous ne devons pas réintroduire des démarches de marché, de produits frais directement, avec des liens plus étroits, avec certains types de producteurs. Mais si oui, (...) à quel moment, de quelle façon etc. ? En même temps, en disant cela, j'ai bien conscience, et c'est tout l'exposé qui nous était fait tout à l'heure, qu'on ne va pas revenir en arrière aux produits de l'agroalimentaire du 19^{ème} siècle ou du 20^{ème} siècle et que l'industrie y a évidemment sa place pour transformer des produits qui soient plus facilement accessibles, plus plaisants etc. Mais là encore, il faudra bien qu'on trouve quelque part des éléments de régulation parce qu'on ne peut pas se limiter à voir arriver des innovations qui sont présentées comme telles mais qui seraient des innovations totalement déroutantes du point de vue de l'équilibre écologique ou des innovations qui seraient totalement déroutantes du point de vue de l'équilibre nutritionnel. Comment organiser aujourd'hui, même si on est pour l'acceptation d'une problématique industrielle de l'agroalimentaire, parce que nous souhaitons tous pouvoir préparer nos plats, peut-être pas tout les jours mais, le plus souvent en ¼ d'heure, 20 minutes et nous n'avons plus le temps de préparer des plats où il faudrait découper, laver et éplucher, assaisonner, cuire des plats qui se faisaient de façon très succulente pendant des années mais qui ne peuvent plus aujourd'hui fonctionner de cette façon. Donc, revenons à l'industrialisation, acceptons aussi les réponses industrielles, si nous acceptons les réponses industrielles, ça ne peut pas être n'importe quoi, parce que les réponses industrielles, on le voit par exemple, dans le domaine des boissons, ça peut être n'importe quoi, quand on voit par exemple un certain nombre de boissons que nous pouvons trouver dangereuses pour la santé publique. Donc, tout simplement pour dire qu'aujourd'hui nous sommes avec ces questions, nous ne sommes qu'au début, d'un certain point de vue, à la fois de la pensée globale et de l'action publique. Parce que nous prenons conscience d'un phénomène qui est très ancré dans la société, la montée de l'obésité et autres problèmes de nutrition santé, ces problèmes sont

finalement très insérés dans notre vie quotidienne, il ne sera pas facile de faire bouger les comportements, les intérêts économiques, mais nous avons à le faire parce que c'est une question tout à fait stratégique.

Q&A

PUBLIC : (...) J'ai été interpellé par rapport à ce que M. Le Guen a dit concernant la famine en Afrique, moi je suis d'origine africaine. Au Cameroun je vivais dans une maison où je cueillais les fruits, c'est-à-dire les fruits poussaient comme ça, naturellement. Et je voulais aussi dire nous exportons, la banane, nous exportons les mangues, nous exportons l'ananas et ce sont des fruits qui sont très riches en vitamines. C'est tout simplement ce que je voulais ajouter. Merci.

PUBLIC (M. SALLES) : (...) Le plus brièvement possible, ce que je veux dire à chacun c'est prudence quand nous avons la parole sur des sujets comme ceux-ci. C'était pour cela que je parlais de la manière dont je l'ai fait du prix. Prudence parce qu'autant je reconnais l'énorme savoir, les énormes avancées qui nous épatent sur la compréhension du métabolisme et de ce qui se passe quand on mange surtout ces 10 dernières années, depuis le premier EGEA, la manière dont vous en parlez me fait comprendre à moi qui ne suis pas de la partie que vous avez beaucoup progressé, que nous progressons à pas de géant. Prudence en matière d'économie parce que nous sommes aussi dans une chose qui est systémique dans le cas d'espèce et qu'agir ici fait bouger les choses là-bas surtout sur des produits qui sont tangibles comme les fruits et légumes et que ce n'est pas si simple et que nous sommes donc dans une espèce de complexité qui doit nous rendre prudent donc, au titre de l'universalité. Parlant de prix, c'est quelque chose qui est très proche dans l'entendement de la valeur, et le prix, pour la population, est une donnée objective. C'est-à-dire que lorsqu'il voit un prix, il pense que cela vaut le prix que cela a (...) d'ailleurs la population s'interroge beaucoup sur le prix des fruits et des légumes parce que cette valeur, probablement objective, varie à leurs yeux, ce qui leur permet de dire « je me suis fait avoir hier » peut-être. En tout cas, les gens qui ont une responsabilité et qui portent une parole forte comme ici, vous, la vôtre, doivent nous encourager à beaucoup de prudence. En tout cas moi j'insiste là-dessus et je rappelle qu'acheter des cerises à 10 euros le kilo ça peut paraître tour à tour scandaleux ou bien un signe de raffinement selon qui le fait, à quel moment il le fait et comment il le fait. Ici nous parlons de populations, je crois aujourd'hui démunies. Et si on dit en même temps que les fruits et les légumes c'est cher, ça veut peut-être dire qu'il y a quelque chose qui est tordu dans le message. Soit ça n'a pas de valeur ou ça a une valeur moindre de ce qui est affiché, donc soyons très prudent à cet égard là. Moi, je pense à la notion de prix et à la notion de ressource puisqu'on a besoin d'une ressource qui se continue et je pense à une idée d'économie durable c'est pour ça que je dis, attention en parlant du prix tant qu'on n'a pas plus travaillé dessus. (...)

PUBLIC : Moi j'ai un petit commentaire sur les prix puisque c'est bien vrai que les fruits et les légumes sont chers sur le plan calorique mais si on fait référence aux

nutriments, en effet, par rapport aux nutriments, c'est très abordable alors il faut tout à fait privilégier et valoriser les nutriments plutôt que les calories. Puisque ce sont les calories vides qui en effet sont les moins chères, les fruits et les légumes par contre, sont très abordables. Moi j'ai une question à poser à M. Le Guen : faut-il insister que l'industrie alimentaire ait un bilan santé de l'offre alimentaire, pour que le bilan santé entre dans le calcul économique ? Puisque l'industrie alimentaire, aux Etats-Unis surtout, s'occupe des questions économiques, des questions santé, la santé des produits alimentaires n'entre jamais dans les calculs. Qu'est-ce qu'on peut faire sur le plan politique pour insister sur ça ?

IM LE GUEN : (...) Est-ce qu'il faut le faire ? Est-ce qu'il faut demander à interpellier l'industrie sur son bilan santé ? Oui, absolument. Quelle est la bonne méthode pour le faire ? Là, c'est peut-être plus compliqué. Mais vous voyez, vous me donnez le mot et ça me donne une idée. C'est très juste ce bilan santé, on pourrait imaginer comme en France on essaie de mettre en place un bilan social je trouve très juste, qu'on pourrait demander aux entreprises d'une façon générale de faire un bilan santé. Ça m'interpelle beaucoup votre idée (...). S'agissant de l'industrie agroalimentaire je crois que là aussi, nous devons l'interpeller. Est-ce qu'on l'interpelle simplement par l'opinion publique ? Est-ce qu'on l'interpelle par la réglementation ? On interdit tel produit, on n'interdit pas tel produit, on autorise telle publicité pour tel produit, on n'utilise pas telle publicité. Est-ce que, comme nous y pousse d'un certain point de vue la tradition des économistes, nous taxons tel produit parce qu'il est plus mauvais par exemple les calories concentrées, (...) produits concentrés par rapport aux calories plus légères ? Moi je ne suis pas très favorable, à priori, au problème de taxation parce que je pense que ça a des effets pervers sur le pouvoir d'achat, sur le coût des produits, c'est soit insuffisant, soit tellement important que ça pose après des problèmes sociaux très lourds. Donc, a priori je ne suis pas très favorable au problème de taxation, encore qu'on pourrait imaginer des taxations qui dans certaines gammes chassent les mauvais produits puisque vous savez que, prenons les sodas, il y a indiscutablement -en tout cas en Europe, en tout cas en France, je sais que c'est un peu vrai aux Etats-Unis mais moins- un effort certains des industriels pour faire bouger leur gamme vers des produits qui soient des produits moins problématiques, tout ce qui est on va dire, du « light » etc., même si ce n'est pas sans poser d'autres problèmes, mais enfin, on ne peut pas ne pas considérer qu'il n'y a pas une évolution de ce côté-là. Maintenant, quand vous faites de la publicité pour un produit qui est sous-entendu « light » et que vous avez un produit caché derrière par exemple sur les colas qui sont vendus avec d'autres marques, des marques distributeurs comme on dit ou des sous-marques qui vendent avec des kilos de sucres parce que ça ne leur pose pas de problème et que quelque part le sucre est moins cher que les édulcorants, là, on pourrait imaginer des taxations qui visent à chasser le mauvais produit par rapport au bon. C'est une stratégie qu'on pourrait imaginer. On avance sur tout ça, on n'a pas de certitude donc quelle est la part de la conscientisation personnelle de l'éducation, de l'information, du jugement de l'opinion publique, bref tout ce qui est, j'allais dire de la communication. Quelle est la part de la réglementation ? Quelle est la part de l'économique ? On n'a pas tellement

de certitude, on avance, on avance sûrement sur la communication, on avance et l'éducation mais pas suffisamment, on avance sûrement sur la réglementation un petit peu et on n'avance pratiquement pas aujourd'hui sur la taxation.

PUBLIC : Est-ce la recherche qui manque pour avancer sur ce projet là ? Soit en science économique, soit en nutrition ?

JM LE GUEN : Ce qui est très important, c'est d'établir les bonnes pratiques en matière de sciences sociales je pense. Il y a trop, dans l'opinion publique, de façons de voir, surtout les problèmes de comportement, des attitudes, j'allais dire, primaires qui sont : on se contente de donner une information rationnelle et on pense que les gens la suivent ou alors on se contente de faire de la pénalisation et on pense que les gens vont réagir par rapport à cette pénalité. Dans les deux cas de figures, ces deux attitudes primaires sont encore les attitudes qui spontanément viennent à l'esprit : je dis la vérité, je sanctionne les coupables. Entre les deux, il devrait y avoir des pratiques des sciences sociales un petit peu plus subtiles et là il faudrait établir un peu plus scientifiquement me semble-t-il tous ces travaux de façon à ce qu'ils deviennent de plus en plus incontournables et ce n'est pas simplement valable pour les problèmes d'obésité et de nutrition.

PUBLIC : (...) Vous avez soulevé le problème, vous avez rappelé les combats dans lesquels l'assemblée nationale et un certain nombre d'élus se sont mobilisés notamment pour l'interdiction des machines à l'intérieur des enceintes scolaires pour les produits « snacky ». Concernant la publicité, la régulation de la publicité visuelle des enfants qui est un sujet d'actualité en France de débat complexe, qu'est-ce que peut faire le politique ? Que peuvent faire les élus dans la démarche que les scientifiques et les responsables de santé publique ont aujourd'hui ?

JM LE GUEN : Ecoutez, il se trouve en plus qu'il y a eu, je dis ça pour nos amis qui ne sont pas français, il y a eu une interpellation pour savoir si on devait ou pas interdire la publicité sur les chaînes publiques, en général, pas spécialement les enfants. Il y a tout un maelstrom autour de tout ça mais c'est compliqué et on ne sait plus trop bien par quel bout prendre les choses. Moi je suis pour des idées claires, je suis pour interdire la publicité alimentaire, et pour tout dire, la publicité tout court dans les programmes pour les enfants. Je trouve complètement aberrant que nous dépensions, sans doute à juste titre, je ne sais plus le chiffre, mais quelque chose comme 30 ou 40 milliards d'euros chaque année pour l'Education Nationale, et qu'on ne soit pas capable de dépenser 300 millions d'euros pour avoir une chaîne de télévision qui soit ludique, éducative et libre de toute publicité. C'est totalement aberrant, nous qui avons un souci de l'enfant rare qui est quand même ce qui marque nos sociétés, on a peur que l'enfant voit une affiche où... à juste titre, et dans le même temps, on n'hésite pas à laisser nos enfants à partir de 2 ans plus de deux heures par jour devant des chaînes de télévisions qui sont totalement financées ou quasi-totalement financées par la publicité. C'est-à-dire que d'abord les programmes sont tournés par les publicitaires, enfin orientés par les publicitaires, et deuxièmement on

les met devant des offres commerciales à partir de 2 ans plus de deux heures par jour. Deux heures par jour c'est treize minutes de publicité par heure, donc ça fait vingt-six minutes par jour dont 80% d'agroalimentaire mais il y a d'autres choses comme les jouets. Faire de la publicité, (...) puisque vous me sollicitez je vais aller jusqu'au bout, pour des jouets qui coûtent relativement cher, problème du prix cher ami, à la veille de Noël quand vous savez que vous avez un tiers des enfants qui regarde ça dont les parents n'auront pas les moyens d'acheter ces jouets, eh bien qu'est-ce qui se passe ? Eh bien ils achètent des glaces au chocolat à ces enfants parce que c'est la glace au chocolat qui est quand même le moins cher par rapport au jouet et on va leur donner des bonbons parce qu'il n'y pas d'autres solutions. Donc le problème est comment nous considérons les enfants dans cette société et si nous considérons qu'on peut les mettre devant la télé, ce qui est déjà un problème, mais admettons que ça soit une réalité difficilement contournable, mais qu'en plus cette télévision est totalement payée par la publicité qui ne fait que susciter des frustrations et des intentions chez des petits humains dont on cherche à les protéger absolument, il y a une aberration économique et politique, qui est absolument invraisemblable. Donc je réponds très clairement, le politique, en tout cas moi, je souhaite l'interdiction de la publicité à la télévision en direction de tous les enfants.

PUBLIC : Juste un petit commentaire, (..) sur les chaînes généralistes l'enfant n'est pas que pendant les programmes jeunesse donc ça pose le problème...

JM LE GUEN : Non mais le plus étant l'ennemi du bien c'est un vieil adage. C'est-à-dire que si déjà dans les programmes avec les dessins animés que vous avez sur toutes les chaînes publiques ou privées, en France comme dans tout les pays, me semble-t-il, à partir de sept heures et demi le matin, des programmes où vous avez de la pub. Des programmes, des dessins animés, de la pub, il n'y a plus aucun contrôle, on ne demande rien aux pédagogues. On fait des programmes télé, personne ne les regarde, à part la personne qui est chargée de la production à TF1, France Télévision etc., mais aucun pédagogue, aucun psychopédagogue. Rien ! On s'écharpe en France, vous le savez, sur les programmes scolaires pour savoir à quel âge on doit compter et apprendre mais on se fiche de savoir ce qui se passe dans les programmes de télévision que regardent les enfants deux heures et demie par jour. On marche sur la tête !

JM BOURNIGAL : On va continuer à marcher en avant et sur nos pieds, (...) dernière question.

PUBLIC (Bernard PITON) : (...) C'est sur la valeur des produits, et je vous rejoins tout à fait, on le voit dans les fruits et légumes : on n'a aucun problème pour vendre des produits de quatrième gamme qui coûtent quatre fois plus cher qu'une salade normale parce qu'il y a une notion de valeur perçue qui est complètement incluse ; on voyait sur les fruits en distributeur automatique aucun problème pour les fruits prédécoupés à 1€ la portion, je dirais, par contre une pomme à 40 cents qui coûtait plus cher à mettre en distributeur automatique qu'un barre de Mars© qui coûtait 70

cents qui elle était donc une notion de valeur perçue alors que la pomme n'en avait pas. Donc je crois qu'on a un travail de fond à refaire là-dessus. Vous l'avez dit tout à l'heure, rapprocher les producteurs des centres villes (...). Moi représentant des grossistes, j'y suis parfois favorable parce que je pense que ça remet du lien avec le produit, c'est quelque chose qui est important, mais par contre il faut aller au bout du raisonnement. Il faut aussi que l'on fasse passer au consommateur qu'un produit frais ce n'est pas quelque chose qui est apporté une fois par semaine en magasin et qui n'est pas pris une fois par semaine, c'est quelque chose qu'on voit tous les jours. On voit le rayon plein tout les jours, mais ce n'est pas le même produit, il est apporté tout les jours si on veut qu'il soit au top. Et ça c'est une valeur qui est une valeur de production, une valeur de logistique, une valeur de grossiste, une valeur de détaillant et je le dis devant les politiques, soyons très prudents au discours qui tend à dire, il n'y a de valeur que la production, et on en parle volontiers avec ... Parce que pour le consommateur, vu que toute autre valeur est une valeur – c'est la valeur de l'intermédiaire qui est une non-valeur et qui peut être gênante – et je reviens par rapport à l'intervention que faisait notre ami Argentin tout à l'heure, je crois que ces produits-là sont des produits –c'est la grande complexité (...), cela va être le défi avec le problème du coût de l'énergie- (...) à distribution fragmentée. Et il va falloir qu'on se pose la question sur le coût de la fragmentation, là je pense que l'industrie est peut être en train de se dire « Tiens, il y a peut être un challenge dans lequel on va gagner » par rapport à ceux qui sont obligés de faire une distribution fragmentée. Parce que la distribution fragmentée c'est vrai que c'est une notion de marché de gros en proximité des sites urbains mais ensuite c'est un problème d'accès à l'intérieur de la ville. Je crois que l'on est dans un débat où c'est effectivement toute une économie de filière qui doit fonctionner.

(...)

Albert HIRSCH

Ligue Nationale contre le Cancer, France

Je suis très heureux d'intervenir à ce moment, dans la droite ligne de votre intervention. L'important est d'aller au plus près des personnes.

D'où je suis, qu'est-ce que j'observe dans la consommation des fruits et légumes et particulièrement dans les populations en difficultés, soit en difficulté matérielle, soit en difficulté psychologique. La Ligue contre le cancer, est une association non gouvernementale indépendante vivant quasi exclusivement de la générosité du publique et d'autre part, vous avez pu le constater à l'occasion de l'intervention de Valérie Guitet du Comité de la Ligue de la Loire Atlantique, est représentée au niveau des départements avec ses 103 comités départementaux plus ou moins implantés au plus près de la population.

C'est un lieu d'observation intéressant. Ainsi, à l'occasion d'une mission aux Antilles, où nous allions parler de la prévention du cancer en général, en Martinique, le débat s'est réduit à l'action du chlordécone sans qu'il soit possible d'aborder les autres risques cancérigènes, contrairement à la manifestation qui s'est déroulée en Guadeloupe lors de laquelle les questions ont porté sur l'ensemble des facteurs cancérigènes. Et puis cela m'a donné l'occasion d'aller sur le marché de Pointe-à-Pitre, où le prix de la banane voisine celui de ce fruit en métropole, ce qui décourage la population de suivre son alimentation traditionnelle au profit de fruits de provenance externe et vendus à un prix plus accessible dans les supermarchés.

La Ligue est par ailleurs relativement bien placée pour intervenir au niveau des personnes défavorisées. Nous agissons ainsi en partenariat avec le réseau très actif des associations œuvrant vers ces publics, telles les régies de quartiers.

Que fait la Ligue dans ce domaine ? D'une part elle a « stické » 100 millions de fruits et légumes en 2006 avec la mention « Mangez des fruits et légumes, c'est une recommandation de la Ligue ». Elle distribue un calendrier avec des recettes simples, des conseils en accord avec les recommandations du PNNS sans oublier la dimension du plaisir, du goût et de la satisfaction.

Elle distribue différents documents, elle organise des conférences et entreprend un certain nombre d'actions, notamment sur les marchés, en tentant d'atteindre les milieux défavorisés.

Quelles orientations prendre? Quand APRIFEL m'a donné l'occasion d'assister au rendu du rapport du WCRF en novembre 2007, je me suis rendu-compte que l'état de la connaissance scientifique sur ce thème est mouvant, la protection par la consommation des fruits et légumes à l'égard du cancer passant d'une appréciation « convaincante » en 1997 à « probable » en 2007. Par contre le risque du surpoids, et de l'obésité reste convaincant. Par ailleurs, le risque est très inégalement réparti selon les caractéristiques économiques, sociales, et culturelles des populations. A coté des déterminants physiques comme l'alimentation, les fruits et légumes, l'activité

physique, joue ce que Michael Marmot appelle la cause des causes, c'est-à-dire des déterminants sociaux, psychologiques et culturels.

Quelles leçons peut-on tirer de l'expérience du contrôle des effets du tabac sur la santé, en se gardant de comparer un comportement relativement simple, la consommation d'un produit, le tabac, à un comportement aussi complexe que l'alimentation ? Il faut évidemment accroître les connaissances. Mais il faut ne pas attendre compte tenu du contexte où se télescopent deux épidémies, celle du surpoids et de l'obésité, celle de la faim dans le monde. Quand vont arriver, de manière massive, sur les grands médias, et notamment à la télévision, à côté des images d'enfants ou de jeunes adultes ou d'adultes en surpoids, celles des enfants qui meurent de faim, quand d'autre part, l'opinion est désorientée par un débat contradictoire sur les pesticides — on doit se poser la question du discrédit dont pourraient souffrir les chercheurs et les décideurs qui seront dépassés par le flux médiatique.

Merci monsieur d'avoir insisté lourdement sur le prix des fruits et légumes, alors qu'il faut aussi s'intéresser à la valeur nutritionnelle et sanitaire de ces produits. Une piste serait peut être de rapprocher la consommation de la production, d'insister sur l'importance de la préparation dans les conditions actuelles de vie des populations et particulièrement des populations vulnérables et fragiles, de s'intéresser aux conditions du stockage, de prendre en compte la perception de ce dont nous parlons.

A titre de référence, et avec les précautions que je rappelais, je voudrais vous rappeler quelques dates concernant le dossier du tabac :

- dès les années 50 : l'enquête auprès des médecins britanniques et l'enquête de l'American Cancer Society démontrent que le tabac est un produit cancérigène ;
- 1962 : rapport du *Royal College of Physicians* et, 1964 rapport du *Surgeon General* ;
- 1976 : première loi française limitant la publicité pour le tabac ;
- 1986 : le ministre de la santé me demande le premier rapport public sur tabac et santé ;
- 1991 : le parlement français vote à une majorité des deux tiers une loi, la loi Evin, de lutte contre le tabagisme et l'alcoolisme ;
- en 2003 : le président de la République, dans le cadre du plan cancer décrète « la guerre contre le tabac » ;
- en 2008 : il est enfin interdit de fumer dans la totalité des lieux publics.

Toutefois, le dossier du tabac est loin d'être clos. En effet malgré cet effort réglementaire, les ventes de tabac n'ont diminué que de 1,5% en 2007, soulignant bien la nécessité d'actions au plus près des populations.

Ce que je souhaite au terme de ce sommet, c'est qu'on tire les leçons d'une telle expérience.

Permettez-moi d'être relativement optimiste et de penser qu'on pourra épargner les dégâts humains, sociaux et économiques d'une stratégie inadaptée. La société et les moyens d'information ont beaucoup changé, et la sensibilité extrême de l'opinion aux questions de santé devraient permettre de tirer les orientations que dessine cette

vraie conférence de santé publique, carrefour où se sont retrouvés des scientifiques, des économistes, des juristes, des décideurs et les médias.

Q&A

PUBLIC : comment se fait-il qu'en Afrique justement là où il y a tellement de misère, il y a vraiment la famine dans certains endroits et les personnes qui ont faim sont très maigres et en Europe, les personnes qui sont démunies elles, grossissent. Comment vous pouvez m'expliquer cela ?

A HIRSCH : La réponse est compliquée, cela fait appel au processus de transition épidémiologique et on est vraisemblablement dans une phase de maturation de l'épidémie où avec d'autres facteurs, comme la malnutrition, comme les diarrhées infantiles, comme la difficulté d'accès aux produits de base, les produits essentiels ne sont pas disponibles. Il est toutefois malheureusement prévisible que l'épidémie de surcharge pondérale atteindra à leur tour les pays en voie de développement et notamment l'Afrique.

SUMMARY OF SESSION NUMBER 20

A DREWNOWSKI: I think it is time for a synthesis and thinking about the common themes of this conference and closing, what I would like to is solicit very brief, 3 to 4 minutes summaries of the earlier morning session which have to do with topics which were discussed in the political session. They were about interventions and initiatives to increase F&V consumption in developing countries, in developed countries, and then methods and means and techniques used to achieve those goals. We will start with Serge and his summary of session number 20 on: interventions and programs to increase F&V consumption in developed nations.

S HERCBERG: (...) Notre session ce matin portait sur les études d'intervention visant à augmenter les apports de fruit et légumes des populations défavorisées, des pays les plus riches, des pays industrialisés. Nous avons eu trois interventions dans trois contextes différents : Annie Anderson d'Ecosse, Dena Herman a parlé des USA mais également du Royaume-Uni et Hélène Bihan pour la France.

Trois points essentiels dans les discussions que nous avons eues ce matin, d'une part bien évidemment tout ce qui concerne l'importance de la problématique de la difficulté de la couverture des apports en fruit et légumes dans les populations défavorisées avec des conséquences sur les apports en nutriments et sur l'état de santé avec ce paradoxe de la malnutrition globale, ce qui rejoint un peu la question soulevée, associant à la fois des faibles apports vitaminiques et minéraux et des problèmes de surcharge.

Le deuxième point très important est qu'ont été passées en revue les différentes méthodes d'intervention, qu'elles s'appuient sur l'individu, de type personnel, ou qu'elles s'appuient sur l'environnement de l'individu en termes d'accessibilité avec la conclusion du fait qu'il n'y a pas, bien sûr, de mesure ou d'action universelle, que les populations sont hétérogènes, qu'il faut prendre en considération de multiples déterminants à la fois individuels et sociétaux. Annie Anderson a beaucoup insisté sur la nécessité de disposer de recherches permettant de déboucher sur des évidences en termes de connaissances des déterminants en partant des populations permettant d'identifier les freins à la consommation, et recherches aussi tout à fait essentielles pour évaluer les actions et évaluer les programmes.

Le troisième point sur lequel je voudrais revenir, c'est que les expériences d'intervention qui ont été présentées montraient que, si au niveau personnel, les actions qui visaient l'individu, l'effet était souvent modeste, lié souvent à des difficultés méthodologiques, même si ces effets étaient modestes ceci n'empêchait pas d'utiliser ce type d'approche au niveau de politique nutritionnelle. Par contre, en ce qui concernait les études d'intervention sur l'environnement, notamment la distribution de chèques, de coupons, d'aide à l'achat et au travers d'exemples très importants qui ont été présentés dont l'étude WIC, les conclusions qui ont été apportées étaient très encourageantes, en montrant au travers de cette étude, et d'autres études, un effet favorable d'un apport sous forme de chèque visant à fournir les moyens d'accéder aux apports de fruit et légumes, un effet favorable durant l'intervention qui a duré six mois mais un effet également persistant au-delà de

l'intervention, six mois après l'arrêt de l'intervention, une excellente acceptabilité avec 88% des coupons donnés utilisés, les 12% non utilisés étant rendus. Donc un effet à la fois favorable, une faisabilité, une acceptabilité excellente au niveau individuel et une acceptabilité qui est tout-a-fait également excellente au niveau des magasins, au niveau des processus qui permettent de développer ce type d'approche avec au niveau des marchés, des supermarchés, une participation voire une stimulation à augmenter l'offre alimentaire. Donc une excellente session qui a abouti à des propositions encourageantes dont il faut réfléchir à l'extrapolabilité à des niveaux plus larges dans un certain nombre de pays.

A DREWNOWSKI: Now, a brief presentation from Ron LEMAIRE on the marketing session today.

Ron LEMAIRE

IFAVA, Canada

This was a big day for the session and we did launch the IFAVA Toolkit which is a Practical Toolkit to basically show national original bodies, how to develop and deliver the 5-a-Day intake program.

We had three core areas we focused on in the presentation. One was on brand development, which is presented by Elisabeth Pivonka from the Produce for Better Health Foundation. Elisabeth basically broke down four core steps that they went through on how you actually develop your brand to deliver your program within a national model. Very important looking at how the Toolkit is developed and at how these pieces are in the Toolkit so that, going back home you can go on the IFAVA website and see how you can take back practices that different countries have used to deliver their program and incorporate them hopefully with any either programs which are currently under development or existing programs to expend. As you see, Elisabeth also touched on how they worked through the process and they actually break developed the brand pyramid which positions the brand and shows the core attributes, the emotional benefits to eventually get to a brand positioning which ended up being their actual brand statement and message which is “fruit and veggies: more matters”.

The key element here on brand development which Elisabeth highlighted was that you have to ensure, when you are moving to your process and we heard this earlier, formative research, making sure you are looking at your segment audiences and targeting who you need to target to design your message to that target group and show that you are using as many channel as you can to get your message in the market place as well as a process evaluation to see how your campaign is running and then an outcome.

We then had the opportunity to look at how this Toolkit supports developing countries. Jane Badham from the 5-a-Day for Better Health Trust out of South Africa broke down the challenges we see in South Africa. This basically looks at the under-nutrition issue, when we look at the world as an under aid development process you see how Africa is very much shrunk. When we're looking at under-nutrition and we take the same at the issues around under-nutrition, we see Africa all of a sudden balloons bigger than North America.

So, the issues for South Africa are slightly different than not only all the obesity issue, we are looking at the fact that we're just not getting enough food. And that also places, in a matter of fact, how they also developed their programs, they are also looking at healthier issue, they are looking at an income issue, poverty, unemployment. And the biggest challenge of all which I truly do find outstanding is a 49 years life-expectancy. All plain factors enter on how their program is developed.

The other key component comes back to part of the branding and messaging, ensuring that your message conveys the correct message for your market and it this

case, in South Africa, vegetables is a primary component, fruit was seen as a piece of product that was unattainable but the vegetables was a daily part of the diet that they could attain, so highlighting F&V, vegetables first was key and that messaging under their 5-a-Day program.

The other key element that had to be looked at under development was myth, urban legend and traditional food. We wrapped things up with Chris (Rowley) providing an outline from Australia on partnership development, we heard that throughout the entire conference, partnership development is key. The core areas and levers for successful outline around formalized partnership were possible, sustainable partnership, long-term organised focus or not, organisation focused not focused on individuals within any organisation; the individual leaves, the partnership disappears if they focus around organisation, the partnership maintains. And the ability to embrace collaborative competition, we saw how the US have over 250 retail stores using their logo, they are all in competition but they are all in agreement to move forward with the same message and icon. Basic common visions, mutual needs, shared decisions and shared risks and benefits are key elements of that partnership. And two statements that I find outstanding in partnerships: “There is never better time to start building and strengthen partnership than right now” and “Don’t judge each day by the harvest you rip but by the seed you plant” and I think this conference is the perfect example, the seeds we are planting here are key for that moving forward.

This is the breakdown on the IFAVA Toolkit; you find this on the IFAVA website at ifava.org and click on the icon you see at the bottom right hand corner. Basically, the Toolkit is a living breathing document, it is built to adapt and change with new information and when older information should be removed. We have a set up so that you are going into each section and you will have a one or two page outline with appendage supporting that information from existing programs and other research and documentation from the global market place. I also encourage you if you are in the site again and you see something missing or you see something that could be changed or improved, please email me, it's something we want to deal with immediately and build upon so that it's a benefit for everyone.

[A DREWNOWSKI:](#) And now a brief summary of the session on developing countries from Francesco BRANCA.

Francesco BRANCA

WHO – Regional office for Europe, Denmark

Our session was entitled “Promotion for the F&V consumption targeting disadvantaged populations”. We had five speakers, Godfrey Xuereb from WHO discussed the framework for school policies that WHO has recently developed. And I think the main point there was the importance to highlight the need to have at the same time, enabling national policies and promotional actions, in other words the importance of having a comprehensive approach to food promotion programs in school that include curriculum development but also include the provision of healthy food and particularly in this case F&V in the school environment.

The next speaker was Ellen Muehlhoff from FAO and she was particularly highlighting the importance of nutrition and education and provision for F&V in school giving some examples from developing countries and she gave the example of the India program. India has been particularly active in "the right to food" campaign and they have established a government supported “Mid-Day Meal” program and the discussion was how to fit F&V in that program. What was particularly interesting was the way they came to a solution to overcome the price, the convenience, the perishability problems and how, for example, shorten the food chain and getting suppliers closer to the consumption points has been practical solutions.

The next speaker was Pauline Samuda from the Caribbean and she was talking about food-based dietary guidelines. As you know, food-based dietary guidelines have been somehow launched after 1992 and now more and more countries have food-based dietary guidelines like in the Caribbean. She was quoting very good examples from 9 out of the 17 countries of the Caribbean. This tool is not only a promotional tool but is seen in many countries as an agricultural policy tool like a charter and everybody has agreed upon to concentrate on the food that have to be selected and used in different context in individual diets and in institutions.

There was also another paper that was presented by Allison Hodder from FAO on behalf (...) of a group including Jacky Ganry and Rémi Kahane and that was about the ways to link different initiatives, country and regional interventions or urban and peri-urban agriculture. First of all, we learned about the need to have more data to understand policy dynamics. Unfortunately (...) information about availability and consumption is not always good enough, particularly in developing countries. But then we learned about some of the dynamics of the food system in the developing world and for example the need to have more specialised F&V supply chains and there is no professional organisation for example in developing countries. So the dynamics and the mechanics of the availability of F&V are actually different. So, more information is needed and better understanding on how to handle the distribution issues.

And finally, Yves Desjardins highlighted the need to have a better communication between agriculture and health research and the need to create forum where this discussion can actually be translated into policy recommendations.

Conclusion

Adam DREWNOWSKI

School of Public Health and Community Medicine, University of Washington, US

This was a very broad ranging conference. We had participants from 30 nations; we had participants from nutrition, epidemiology, anthropology, sociology, economics, behaviour sciences, demography, policy analysis and politics. There were agreements, there were some disagreements but most today was agreement about the role of F&V in promoting healthy diet. So what we have done is a kind of final statement to select those areas where there was, in fact, agreement. And I wanted to read you some of those statements to make sure that we arrive at the consensus at the end of the conference and that we agree on some of the principle points.

So these statements are: the arising rate of food insecurity and the rising rate of obesity represent a real burden for global public health. We also see high rates of chronic diseases that are largely preventable through a healthier diet. So I hope we all agree with the statement here that improving diet quality has to be seen by all as an urgent priority for global public health.

On a second part of this statement which follows directly, we say that high consumption of F&V is associated with higher overall diet quality and with healthier lifestyles. There is emerging evidence from epidemiology and from behaviour that F&V consumption may also play a role in weight control. By contrast, inadequate consumption is clearly associated with elevated risk of chronic disease. So the second part of this statement is that increasing the consumption of F&V is the key to improving the diet quality for all.

And here we come for some practical applications. The first is that making sure that all populations included disadvantaged ones have equal access to affordable F&V requires an alliance between agriculture, health and public policy and I should also mention politics because it is exactly what we were talking about in the last session, we need research but at the same time we need political will. And the key focus areas for effective population based preventions, programs and policies should include schools and worksites and community settings and the media and all those topics were discussed and mentioned in this conference.

Insuring access to healthy diets by all segments of the population should be a priority for public health. It should be a responsibility of both the food industry and governments as we brought about earlier on, in particular, we urge European Union and the national governments to move forward to funding implement the school-food scheme to provide fruit and fresh produce for schoolchildren. And then we call on the World Health Organisation, the Food and Agricultural Organisation to continue to provide strong global leadership in promoting increased consumption of F&V worldwide. All member countries are urged to fund, develop and implement

comprehensive, coordinated and sustainable policies and programs to improve access to health promoting F&V. And such measures, brought about to a convergence between Agriculture and Public Health will significantly reduce the global burden of chronic disease.

This is the final consensus statement of the conference: I hope you are in agreement with that, do I hear any opposing voices ? No ? Thank you all for coming.

Fruit and Vegetable Summit Proceedings



May 27-30, 2008 - Unesco, Paris

Presented by EGEA – IFAVA
Co-sponsored by the World Health Organization (WHO)
With the participation of the European Commission
With the support of the French Ministry of Agriculture
With the technical cooperation of the Food and Agriculture organization of the United Nations (FAO)

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NUTRITION SESSIONS

From scientific knowledge to intervention studies : How to enhance F&V consumption?

P

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SESSION 3

F&V INTERVENTIONS TO REDUCE CARDIOVASCULAR DISEASES

Chair: **K.T. Khaw**

- The importance of F&V in the prevention of cardiovascular disease. **F.J. He**
- Are supplements equivalent to dietary micronutrient consumption? **J.V. Woodside**
- Effects of F&V consumption on plasma blood pressure: intervention study. **L. Dauchet**
- F&V and cardiovascular disease risk: what should we do? **K.T. Khaw**

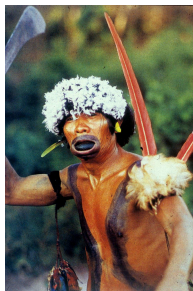
The importance of F&V in the prevention of cardiovascular disease

Feng J. HE

Blood Pressure Unit, Cardiac & Vascular Sciences, St. George's University of London, UK

Cardiovascular disease is the leading cause of death and disability worldwide. The two major forms of cardiovascular disease are stroke and coronary heart disease. It is estimated that, worldwide, over 16 million people die of cardiovascular disease each year, that's equivalent to approximately 30 deaths every single minute. In addition to this, there are approximately another 20 million people who suffer a stroke or heart attack but survive. Many of these people will have to live with different degrees of disability for the rest of their lives and many of them would require long-term very costly medical care. Therefore, the primary prevention of cardiovascular disease is a major public health priority.

A number of risk factors for cardiovascular disease have been indentified. To tackle cardiovascular disease, all of these modifiable risk factors should be dealt with. We should lower blood pressure, lower cholesterol, stop smoking, eat more fruit and vegetables, do more exercise and reduce obesity. Today I am going to talk about the evidence for the increase in the consumption of fruit and vegetables to prevent cardiovascular disease.



I would like to begin with the studies in a very few tribes that still exist in the world. This is one such man, a Yanomama Indian from the border of Venezuela and Brazil living an evolutionary lifestyle. They mainly live on fruits, vegetables, roots and occasionally monkeys that they can catch. In their diet, there is no salt, very little fat and no refined carbohydrate. They are aggressive, very fit and have a lot of stress. In such populations, the average blood pressure and cholesterol are much lower than those in the developed countries. And in such populations, their blood pressure does not increase with age and there is no evidence of cardiovascular disease. Some people may argue that the Yanomama Indians die at a younger age before they develop a high blood pressure and cardiovascular disease. However, ecological studies have compared age-matched populations and showed that the populations that still have evolutionary lifestyles, have a significantly lower blood pressure, and the major cause of death for the Yanomama Indians is infectious disease.

A number of case-control epidemiological studies have specifically looked at the relationship between fruit and vegetable consumption, or some surrogate markers of fruit and vegetable consumption, and cardiovascular disease. So far, there have been 16 studies on coronary heart disease and 1 study on stroke. Most of these studies have shown a significant inverse association. In other words, a higher consumption of fruit and vegetables was associated with a lower risk of cardiovascular disease.

The largest case-control study is the INTERHEART study. It included over 15,000 cases of acute myocardial infarction and approximately the same number of controls. Only first acute cases of myocardial infarction were included in order to minimize any potential bias due to changes in diets or lifestyles following a coronary event. The study was carried out in 262 centres from 52 countries. The investigators used standardised methods for data collection across the world. The results showed that individuals who ate fruit and vegetables daily, compared with those who did not had a 30% lower risk of myocardial infarction after adjusting for all of these confounding factors.

Prospective studies have the advantage of eliminating any potential selection bias or recall bias which are more likely to occur in case-control studies. There have been over 20 prospective cohort studies looking at fruit and vegetable consumption and the subsequent occurrence of cardiovascular events. We have recently carried out a meta-analysis of these cohort studies. We included studies that had reported relative risk of stroke or coronary heart disease and their corresponding 95% confidence interval. For inclusion, studies had to provide the frequency or amount of fruit and vegetable consumption in relation to the relative risks. We excluded studies that reported a mixed healthy diet where the effect of fruit and vegetables could not be separated. We also excluded studies that reported only surrogate nutrients of fruit and vegetables rather than fruit and vegetables themselves.

For each individual study, we grouped fruit and vegetable consumption into 3 standardized categories, that is: less than 3 portions per day, 3 to 5 portions per day and over 5 portions per day. The corresponding relative risks of stroke or coronary heart disease were also grouped accordingly. We used random-effect model to calculate the overall relative risk.

This table shows the number of studies included in the meta-analysis.

	Stroke	CHD
Number of cohorts	9	13
Number of participants	257,551	278,459
Number of events	4,917	9,143
Duration of follow-up (yr)	13	11

He et al. Lancet 2006;367:320 & JHH 2007;21:717.

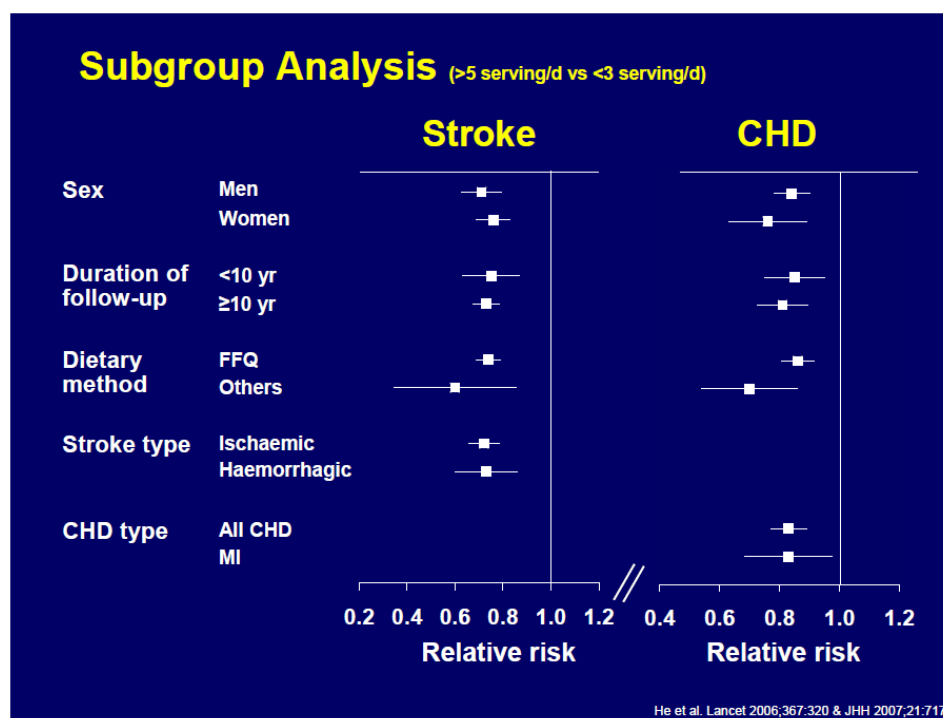
For stroke, 9 cohorts met the inclusion criteria; there were over 257,000 participants with an average follow up of 13 years. A total 4,917 strokes occurred. For coronary heart disease 13 cohorts met the inclusion criteria, there were over 278,000 participants with an average follow up of 11 years. A total of 9,143 coronary events occurred.

The results showed that an increased consumption of fruit and vegetables was related to a reduced risk for both stroke and coronary heart disease.

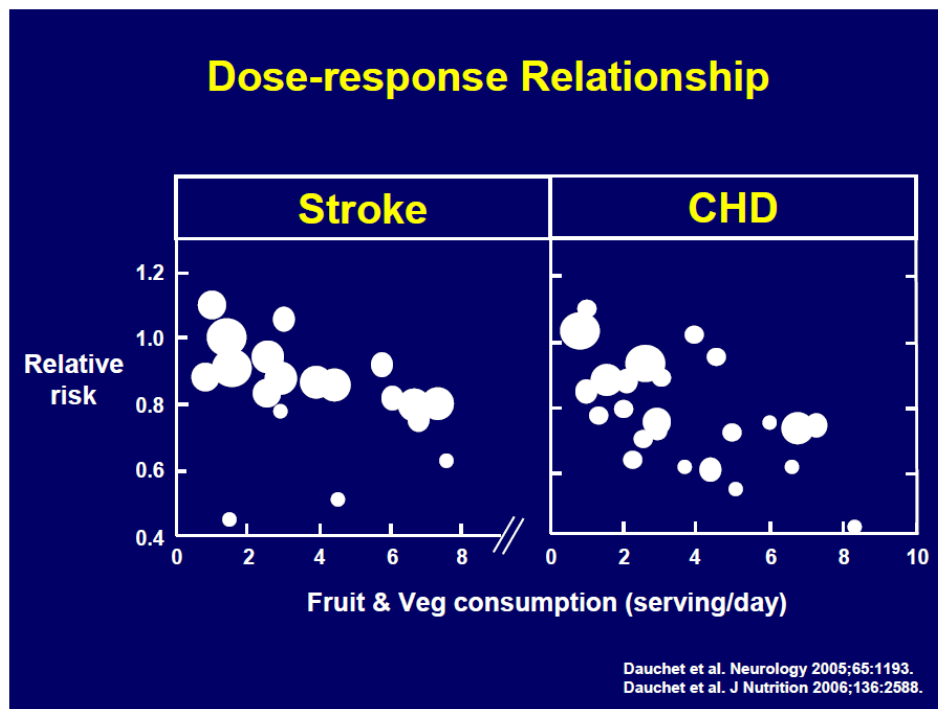
This figure shows the relative risk of stroke and coronary heart disease. Compared to the individuals who had less than 3 portions of fruit and vegetables per day,

individuals with 3 to 5 portions per day had an 11% lower risk of stroke and 7% lower risk of coronary heart disease. Individuals who had more than 5 portions per day had a 26% lower risk of stroke and 17% lower risk of coronary heart disease. All of these relative risks were adjusted for potential confounding factors.

This figure shows the sub-group analysis comparing individuals who had more than 5 portions per day with those who had less than 3 portions per day. The vertical lines are the relative risk of one, and these squares indicate the relative risk for the subgroups. If this square is on the left side of this vertical line, this indicates a protective effect. You can see that a higher consumption of fruit and vegetables had a significant protective effect for all of these subgroups. In other words, there was a significant protective effect for both stroke and coronary heart disease irrespective of gender, duration of follow up or dietary assessment methods. For stroke, there was a significant protective effect for both ischemic and haemorrhagic stroke. For coronary heart disease, the effect was significant for myocardial infarction alone or when all coronary events were considered together.



Another recent meta-analysis of cohort studies was the carried out by Dr. Dauchet and colleagues. Their papers were published around the same time as ours. They used a different statistical approach to analyse their data. These figures are from their papers. The y axis is the relative risk for stroke or coronary heart disease, and the x axis is the portions of fruit and vegetables per day. You can see that there is a clear dose-response relationship. So the higher the consumption of fruit and vegetables, the lower the risk for both stroke and coronary heart disease.

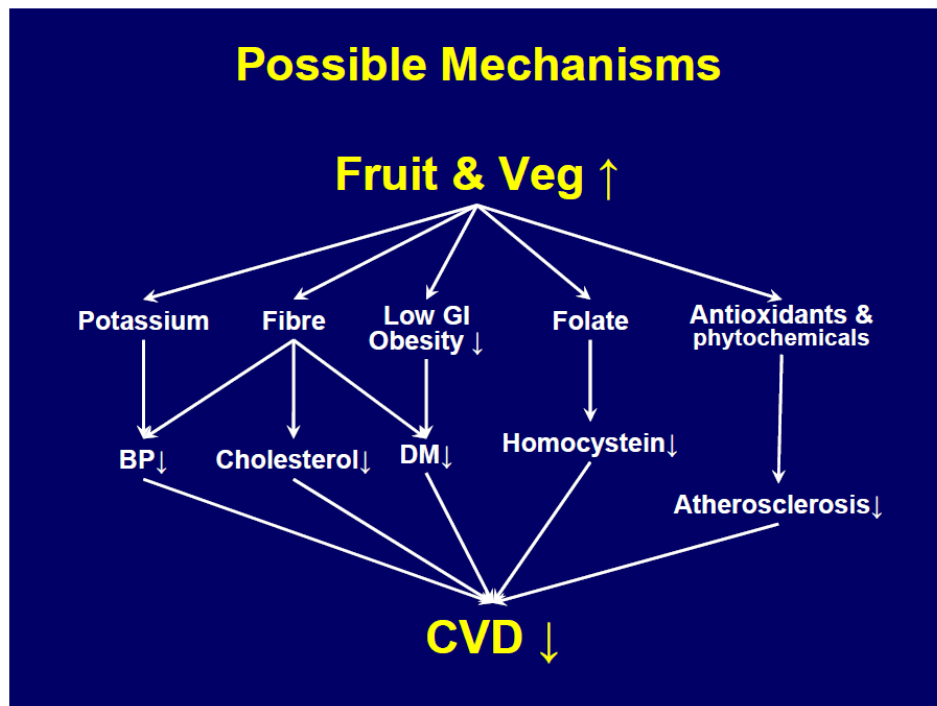


Outcome trials would provide stronger evidence. However it is extremely difficult to carry out long-term randomized trials on any dietary or lifestyle interventions on cardiovascular disease outcome. It is therefore not surprising that there is no randomized trial looking at fruit and vegetables alone on the primary prevention of cardiovascular disease. However there are a couple of randomized trials that have looked at the effect of an increase in the consumption of fruit and vegetables in combination with other healthy diets or lifestyles, particularly in individuals who had survived cardiovascular events. These trials have provided further support for an increase in the consumption of fruit and vegetables to prevent cardiovascular disease.

The Lyon Diet Heart Study is a good example. Over 600 individuals who had survived an acute myocardial infarction were randomized into 2 groups: the experimental group and the control group. In the experimental group, all participants were given advice by research dieticians on how to follow a Mediterranean diet which is rich in fruit and vegetables, olive oil, fish and low in red meat. Cream and butter were replaced with rapeseed oil based margarine. In the

control group, participants did not receive any specialist's advice from the research team, apart from the routine dietary advice from their own doctors. After four years of follow up, the experimental group had a 70% reduction in cardiac deaths and nonfatal myocardial infarction. It is a huge reduction. Although this outcome was not solely attributable to fruit and vegetables, this study clearly suggested that an increase in the consumption of fruit and vegetables in combination with other healthy diets reduces cardiovascular disease.

How do fruit and vegetables protect against cardiovascular disease? The mechanisms are likely to be multiple.



Fruit and vegetables are rich sources of potassium, folate, fibre, antioxidants and many phytochemicals. Randomized trials have shown that an increase of fruit and vegetable consumption leads to an increase in 24-hour urinary potassium excretion and a fall in blood pressure. Clinical trials have also shown that potassium supplementation had a similar blood pressure lowering effect. We all know that raised blood pressure is a major cause of cardiovascular disease, therefore the blood pressure lowering effect of potassium is likely to be an important mechanism for the protective effect of fruit and vegetables on cardiovascular disease. Increasing evidence also suggests that the potassium may have a direct effect on reducing cardiovascular risk which may be independent of but additive to the effect of the potassium on blood pressure.

Dietary fibre may reduce cardiovascular disease through its effect on blood pressure, cholesterol and reduce the risk of diabetes. As we have heard in the earlier session this morning, fruit and vegetables play an important role in the management of obesity, therefore reducing the risk of diabetes and cardiovascular disease.

Dietary folate may reduce cardiovascular risk through its effect on plasma homocystein levels. Antioxidants and bioactive phytochemicals may prevent the development of atherosclerosis.

I am going to briefly talk about one of these mechanisms that are potassium and cardiovascular disease. The earliest study on potassium and stroke was reported by Professor Khaw & Professor Barrett-Connor. In a prospective cohort study they followed up 859 men and women from Southern California for 12 years. They found that a 10 mmol increase in potassium intake, which is equivalent to 1 to 2 portions of fruit and vegetables per day, was associated with a 40% lower risk in stroke mortality after adjusting for all of these confounding factors including blood pressure. Later on, a number of larger cohort studies have confirmed Professor Khaw's findings. Recently an outcome trial on potassium was published. This trial was carried out in almost 2000 elderly veterans who lived in a veterans' retirement home in Northern Taiwan. In this veterans' home, 5 kitchens provided all food for all participants, and these 5 kitchens were randomized into two groups. In one group, the normal salt, which is sodium chloride, was used as usual. In the other group the normal salt was replaced with a potassium-enriched salt which is higher in potassium chloride and lower in sodium chloride. With this intervention there was a 76% increase in potassium intake and a 17% reduction in sodium intake in the intervention group. After two and half year of follow up, the high potassium group had a 40% reduction in cardiovascular disease mortality. This randomized trial clearly demonstrates that an increase in potassium intake and a reduction in sodium intake reduce cardiovascular disease mortality.

To summarize, ecological studies, case-control studies, prospective cohort studies, and secondary prevention trials have consistently demonstrated the importance of fruit and vegetables in the prevention of cardiovascular disease. Studies have also shown a clear dose-response relationship, so the higher the consumption of fruit and vegetables, the lower the risk of cardiovascular disease. Additionally, the protective effect of fruit and vegetables has a strong biological basis. Taken together, the totality of evidence strongly supports a causal relationship. In other words, a low consumption of fruit and vegetables is a cause of cardiovascular disease.

How much fruit and vegetables are we eating now? The average fruit and vegetable intake in most developed countries is between 3 and 4 portions per day. It is even less in developing countries. This figure shows the average fruit and vegetable consumption for adults from the Health Survey for England from year 2001 to 2006. The bar in yellow indicates the intake for men and the bar in blue is for women. From 2001 to 2006 there has been a small increase in fruit and vegetable consumption, but even in 2006 the average intake was only 3.3 portions per day for men and 3.7 portions per day for women.

This figure shows the proportion for adults who consumed 5 or more portions of fruit and vegetables per day; the data was again from the Health Survey for England.

From 2001 to 2006 there has been a small increase in the percentage of individuals who consumed 5 or more portions of fruit and vegetables per day. But even in 2006, only less than one third of adults had fruit and vegetable intake reached the recommended level of 5 or more portions per day. And over two thirds of adults had fruit and vegetable intake below the minimum recommended level.

In conclusion, what I have shown you today is that cardiovascular disease is the leading cause of death and disability worldwide. A low consumption of fruit and vegetables is an important cause of cardiovascular disease. Currently in most developed countries the average fruit and vegetable intake is between 3 and 4 portions per day and less than one third of adults have the intake reached the recommended level. These figures are even lower in developing countries. Therefore greater efforts should be made to increase fruit and vegetable consumption in the whole population. If the recommended levels are achieved, the benefits will be very large in terms of reducing the appalling burden of cardiovascular disease worldwide. Furthermore an increase in the consumption of fruit and vegetables may have other beneficial effects, for example, reducing the risk of some cancers and some other chronic diseases. I would like to finish with this statement from the World Health Organisation. This was based on an analysis from Dr Lock and colleagues: *"Worldwide, up to 2.7 million lives could potentially be saved each year with sufficient global fruit and vegetable consumption"*.

Q&A

PUBLIC: The data of the meta-analysis which represented that low fruit and vegetable consumption among men and women was associated with a higher risk of CVD and stroke was independent of the consumption of other food groups and other co-variables associated with a risk of CVD?

KT KHAW: The question is: was the relationship between fruits and vegetables and cardiovascular disease in the observational studies independent of other food associated with CVD?

FJ HE: Almost all of the observational studies have adjusted for confounding factors as much as possible. However, we can not exclude the possibility that some un-measured factors may still have some confounding effect on the association between fruit and vegetable consumption and cardiovascular disease. But it is unlikely that all results from the observational studies were due to the confounding effect of the un-measured factors.

PUBLIC: One of the notable things you raised was that there is a suggestion that the relationship is stronger for stroke than coronary heart diseases. Do you think this is real?

FJ HE: I am not aware of any studies that have directly compared the effect on stroke with the effect on coronary heart disease, but one of the mechanisms for the protective effect of fruit and vegetables is through the blood pressure lowering effect. Because blood pressure is more closely related to stroke compared to coronary heart disease. So it is likely that fruit and vegetables may have a greater effect on stroke than coronary heart disease, but this is only based on speculations. The statistical comparisons are better to be made within a study to compare the effects on different cardiovascular outcomes.

PUBLIC (American Cancer Institute): I noticed you lumped all the data together after 5 servings and I wonder if you have any evidence that there are some benefits when you actually increase the number of servings from 5 to 9 or from 9 to 11. Is there any kind of evidence of any benefits out there?

FJ HE: We were not able to look at this in our meta-analyses. But some studies did have a higher fruit and vegetable consumption from 1 to 10 portions per day and they have shown a clear dose-response relationship, so the higher the consumption of fruit and vegetables, the lower the risk.

PUBLIC (American from the Cancer Institute): Typically when you have that high amount of consumption there are few fruits and vegetables that predominate. What fruits and vegetables are we talking about when you increase from 3 to 5 to 9 to whatever number? Are there really some fruits and vegetables that really help more than others?

FJ HE: The information on this is very limited in the literature. Some studies did suggest that green leaf vegetables, cruciferous vegetables, citrus fruits have a greater effect, but further studies are still needed to clarify this. I think we need to remember that the beneficial effect of fruit and vegetables is due to the combination of many nutrients contained in fruit and vegetables. It is unlikely that any single fruit or vegetable could provide the whole complex biochemical compounds contained in a variety of fruit and vegetables. Based on the available evidence, I think we should eat a wide variety of fruit and vegetables.

PUBLIC (Eric LEMERCIER, Groupe MedAlliance Europe, Producteur de Fruits et légumes): Je suis un petit peu inquiet sur les tenants qui sont aujourd'hui donnés par les orateurs toujours sur la véracité de ce que peut apporter les fruits et légumes. On est toujours un peu sur une réserve de « peut être », « c'est probable », « c'est une liaison ». Comment pensez vous que l'on puisse aujourd'hui à valider chez les consommateurs d'accroître justement leur consommation quand nous même aujourd'hui nous n'arrivons pas à dire clairement si les fruits et légumes apportent réellement un bien fait avec des preuves à l'appui ? J'ai cette sensation qu'on est

toujours sur des réserves. C'était moins démontré tout à l'heure mais on se pose toujours la question : « c'est probable qu'il y ait une liaison », « mais », il y a toujours ce « mais ». Si nous même nous ne sommes pas convaincus du bienfait des fruits et légumes sur la santé des consommateurs à travers le monde comment ces consommateurs eux-mêmes peuvent-ils être convaincus ?

FJ HE: I know that there are still some uncertainties in these areas, but I believe, based on the available evidence, the evidence is strong, particularly when looking at the different types of studies - ecological studies, case-control studies, prospective cohort studies, secondary prevention trials and also studies on mechanisms, have consistently shown the importance of fruit and vegetables. So the evidence is strong. Now how to convince the consumers? There will be a session to discuss this.

Are supplements equivalent to dietary micronutrient consumption?

Jayne V. WOODSIDE

Centre for Clinical and Population Science, Queen's University Belfast, Ireland

The outline of the presentation will be as follows: I am going to first talk about the evidence that micronutrient supplementation reduces cardiovascular disease risk and then looks at the evidence that increasing dietary micronutrient intake reduces cardiovascular disease risk. Throughout the presentation, I will concentrate on randomized controlled trial evidence wherever possible.

Clinical micronutrient deficiency is by now uncommon in the developed world. However, it has been proposed that sub-optimal intake of certain micronutrients could be associated with increased cardiovascular disease risk. Therefore, if we increase micronutrient status that will be theoretically linked with reduced cardiovascular disease risk.

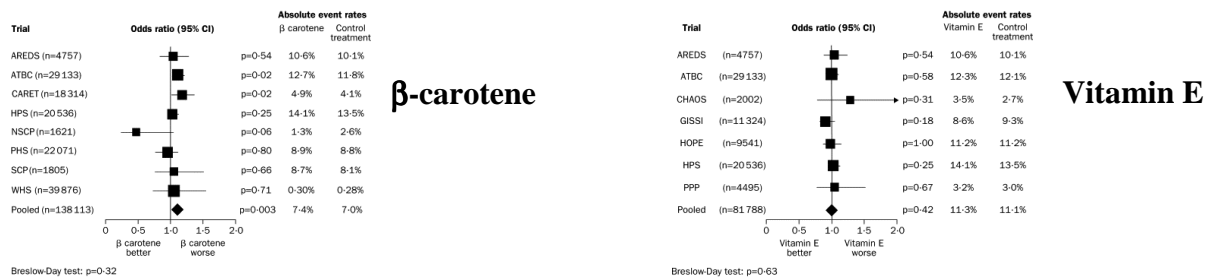
How do we increase micronutrient status? We have a number of options: we can use micronutrient supplements, we can increase the consumption of micronutrient rich foods or finally we can fortify our food with the micronutrient of interest. I am not dealing with food fortification within this presentation.

What evidence do we have linking increase micronutrient status, by whatever means, with reduced cardiovascular disease incidence? We have a number of different strands of evidence. Firstly we can look at the increased micronutrient status in animal models, and whether that produces a change in CVD risk. We can look at increasing micronutrient status in healthy subjects and look for a change in cardiovascular disease biomarkers. We can carry out observational epidemiological studies and look at whether increased intake of a particular micronutrient is associated with reduced risk of cardiovascular disease. Finally we can carry out the randomized controlled trials of micronutrients - intervention studies with clinical end points where we look for a change in cardiovascular disease risk. I will concentrate in this presentation on the last two strands of evidence, and as I said primarily on randomized controlled trials where they exist.

This slide is included just to introduce the fact that we do have wealth of observational evidence linking increased micronutrient status with reduced risk of cardiovascular disease and it has been reviewed extensively over the years, this by Fairfield and Fletcher in 2002 in JAMA. That wealth of observational evidence led into a series of randomized control trials of isolated micronutrient supplements. A number of micronutrients have been tested, including B-group vitamins but because of the limited time today, I am only going to look at antioxidant vitamin supplementation and cardiovascular disease.

Randomized control trials started to be reported in the mid to late nineties and since then they have been subjected to meta-analysis as the data from the various RCTs

were reported. Largely these studies have reported no effects of antioxidant vitamin supplementation on cardiovascular disease risk.



This is a meta-analysis carried out in 2003 showing that the supplementation of β -carotene in fact seems to lead to an increased risk of cardiovascular disease and for vitamin E there seems to be no effect of supplementation with vitamin E on cardiovascular disease end points.

Miller et al. in 2005 attempted to look at the dose-response relationship between vitamin E supplementation and all cause mortality rather than cardiovascular disease mortality in randomized controlled trials. They showed some evidence of a dose response effect; the higher doses of vitamin E seemed to be harmful, while at lower doses there seemed to be some evidence of a small protective effect. Further work carried out by a Danish group published in JAMA last year and published as a Cochrane review this year looked at the effect of antioxidants supplementation on overall mortality. They classified trials as having a low risk of bias if generation of allocation sequence was reasonable, if there was a blinding of allocation etc, and they classified a total of 47 trials as having a low risk of bias. Using those 47 trials they showed a small increase in risk of mortality for those taking antioxidant supplements versus placebo with a relative risk of 1.05. They then looked at the effect of individual antioxidant supplements, excluding the selenium trials because they showed some evidence of benefit, and once they excluded those trials, β -carotene, vitamin A, vitamin E, either singly or in combination, all significantly increased mortality.

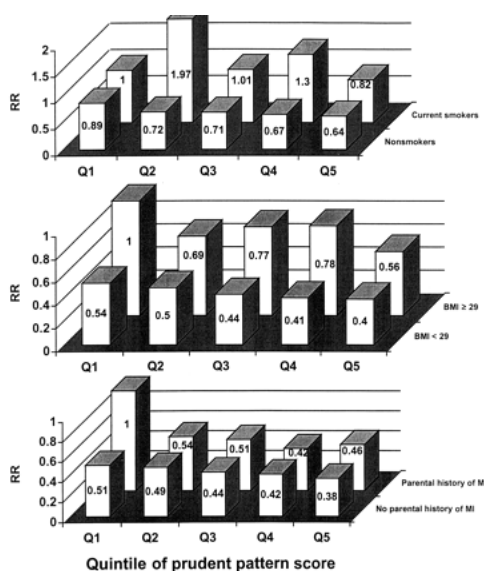
Now not all studies have been negative. We have the *AREDS* study which used a cocktail of antioxidant vitamins and showed a reduced progression from early stages of age-related macular degeneration (AMD) to the later stages of AMD. We also have the *SPACE* study which looked at the effect of vitamin E on cardiovascular disease endpoints in stage renal disease patients and showed a reduced proportion of patients with cardiovascular end points in the intervention versus placebo groups. However, by and large, these intervention studies with antioxidant vitamins have been negative and there has been great debate as to why these clinical trials have been negative. There has been criticism of these trials themselves; firstly they used an isolated antioxidant rather than a whole food or rather than a panel of antioxidants. There has been debate about the dose used, whether it was too low or too high etc. There has been debate over the duration of treatment with the antioxidants and the

duration of follow up after treatment with the antioxidants. There has been debate over the initial micronutrient status of the subjects invited to take part in these studies and their dietary intake and debate over the extent and distribution of existing disease. For example antioxidants have been shown to protect against LDL oxidation which is one of the crucial early stages in the development of atherosclerosis where a lot of human studies have recruited people who were quite advanced in the cardiovascular disease pathway in that they were already at a high risk of the disease e.g. they had high blood pressure levels or they were smokers. So there has been much debate about the design of the trials that have been carried out. There has also been debate over two more general issues. Firstly, on the micronutrient used - it has been proposed that it is the foods themselves rather than the isolated nutrients that are protective. We find a complex mixture of antioxidant micronutrients and other bioactive components in fruits and vegetables. Maybe these are more effective than large doses of a small number of micronutrients. There is also the issue of confounding in observational studies where we did see an association between antioxidant intake and cardiovascular disease outcomes. It has been proposed that this association may have been confounded by other lifestyle behaviours, despite best efforts to control for these confounders. For example, it has been shown that a high intake of antioxidants is associated with a better overall diet, is associated with increased physical activity, with not smoking and with higher social class. And it has been proposed that the adjustments made to the analyses of the observational studies simply could not control fully for that confounding. It is therefore actually perhaps one of these other lifestyle factors that are causally linked with a reduced risk of cardiovascular disease.

It has also been proposed that it may be a combination of these things that is having a reduced effect on cardiovascular end points and that it is total diet and lifestyle pattern that is crucial. That is summarized quite effectively in an editorial that appeared in *Lancet* in 2004 where Forman and Altman said: "The effect on diseases with long latency periods of pharmacological doses of specific micronutrients over a few years in middle-aged adults is a different scenario from physiological doses of the same micronutrients provided as part of a balanced diet on a lifelong basis, starting in childhood."

The second part of the talk looks at the evidence that an increase in dietary micronutrient intake will reduce cardiovascular disease risk. There are a number of approaches to study dietary patterns, for example looking at people who consume a vegetarian diet, looking at increased fruit and vegetable intake, looking at the Mediterranean diet and finally looking at combined health behaviours. Each of these dietary changes, will involve an increase in micronutrient intake, although there will also be a change in intake of other nutrients. It is actually difficult to definitely establish whether a health benefit is directly due to the increase in micronutrient intake but these are the approaches that have been taken.

Firstly dietary pattern analysis: this arose from a realisation that we do not consume nutrients in isolation, we do not consume foods in isolation but we consume an overall diet and concentrates therefore on that overall diet rather than one nutrient. A number of statistical techniques can be used to determine dietary patterns - most commonly principal component analysis but also cluster analysis or reduced rank regression. These aggregate food items and groups based on the degree to which these are correlated with each other and consumed together and that produces a summary score for specific dietary pattern. Now the dietary pattern produced depends on the data but it commonly produces a number of patterns. One is usually called the prudent pattern that can be characterized by higher intake of fruit, vegetables, legumes, whole grains, poultry and fish. And the western pattern which is characterized by higher intakes of red and processed meats, sweets, desserts, potatoes, chips and refined grains. This sort of analysis has been applied to a number of observational studies with heart disease end points.



This is one of the first occasions where dietary pattern analysis was applied by Hu et al. in 2000 and you can see that this is looking at the quintile of prudent pattern score by smoking status, BMI, and parental history of myocardial infarction and looking at multivariate relative risks going from low to high prudent pattern score. And you can see that classified by smoking status, BMI or parental history of MI, you can see that the relative risks tend to decrease as the score for the prudent dietary pattern increases.

It is crucial to show that these dietary patterns are associated with change in micronutrient status and we have done some work in this area using a

relatively small cross sectional study on healthy men who were 30-49 years. We carried out principal components analysis to pull out dietary patterns and we found 5 dietary patterns. The first pattern which we called the healthy pattern was characterized by increased intake of wholemeal bread, high fibre breakfast cereals, fruit and vegetables and that healthy pattern was positively associated with folate, α -carotene, β -carotene and lycopene status and negatively associated with homocysteine. Therefore we can say that dietary patterns are associated with a change in micronutrient status.

Moving on to the vegetarian diet, the largest study of the vegetarian diet so far carried out was a pooled analysis of 5 prospective studies by Key et al. They ended up with 76'000 subjects with just under 30'000 were vegetarians and they showed that mortality from coronary heart disease was 24% lower in vegetarians than in non-vegetarians with no significant difference in mortality from cerebrovascular disease and cancer. Now it is clear that the vegetarian diet is a heterogeneous dietary pattern

but it tends to be that vegetarians have higher micronutrient intakes than non-vegetarians.

Moving on to fruit and vegetable intake and coronary heart disease and cardiovascular disease, it has been shown as we have heard previously from Dr He that increased consumption of fruit and vegetables is linked with reduced risk of CHD, CVD and all cause mortality and these studies have been subjected to meta analysis from Dr DAUCHET and Dr HE. The evidence is less consistent for cancer.

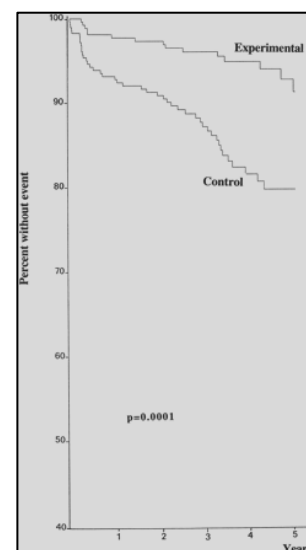
Again it is crucial to show that if we increase fruit and vegetable intake we increase micronutrient status. Zino et al. in 1997 randomized subjects who ate 3 or less portions of fruits and vegetables a day to either continue to eat less than 3 or less portions of fruits and vegetables a day or to increase to 8 portions per day. They actually saw an increase to nearly 8 in self reported numbers of servings per day. They saw that that produced a significant increase in β -carotene, α -carotene and vitamin C. It was shown by Brouwer et al. in a separate intervention that a diet high in Citrus fruit and vegetables increased folate status. There have been a number of randomized control trials of fruit and vegetables consumption on intermediate end points for cardiovascular disease or risk factors for cardiovascular disease. I am sure Luc will concentrate on this in a little more detail in his presentation but this was a study made by John et al. which was a 6 months RCT of advice to increase fruit and vegetables intake to at least 5 a day. They saw a significant reduction on systolic and diastolic blood pressure. Similarly the DASH study published in the late nineties looked at the effect of a fruit and vegetable-rich diet or a fruit and vegetable-rich and low-fat dairy product-rich diet versus control diet on blood pressure. For fruit and vegetables only they saw a significant a reduction in systolic and diastolic blood pressure but a further decrease on systolic and diastolic blood pressure when the fruit and vegetable-rich diet was combined with the low-fat dairy product-rich diet.

We have carried out some work in this area and in fact we are currently carrying out five fruit and vegetable intervention studies with clinically relevant endpoints. This is the first one to complete the other four are ongoing. It was called the "FAVRIT study" and was looking at the effect of dietary intake of fruits and vegetables on vascular function. We recruited 112 subjects with mild hypertension and they went on 1 portion of fruit and vegetable daily for a period of four weeks. They were then randomized to continue one portion a day or to consume 3 portions a day or to consume 6 portions a day for a period of 8 weeks. We measured vascular function at the start and end of the intervention period. We saw a dose-dependent effect of increased fruit and vegetable consumption on our primary end point which was forearm blood flow responses to intra-brachial acetylcholine, an endothelium-dependent vasodilator. This is an established index of vascular endothelial function. There was a significant dose-dependent improvement in endothelial function and this was associated with an increase in vitamin C, and increase in lutein and an increase in β -cryptoxanthin. So we were changing micronutrient status and then seeing these effects on endothelial function. Interesting, we did also see a trend that it was affecting blood pressure which may be of interest for the next presentation.

The Mediterranean diet has been associated with improved all cause mortality or survival and a number of large studies have confirmed this. This year in a large American population (the first to test this in a non-Mediterranean population) adherence to the Mediterranean diet score was associated with an increase in survival or reduced all cause mortality. There have been a number of interventions with Mediterranean style diets. This one is by Esposito published in JAMA in 2004 looking at the effects of 2 years of Mediterranean diet on features of the metabolic syndrome in people with the metabolic syndrome. They showed a significant change in HOMA score, significant improvement in endothelial function, reduction in high sensitivity CRP, reduction in IL-6 and there was a significant reduction in the number of the patients with the metabolic syndrome in the intervention group compared to the control group.

Again, we heard about the Lyon Heart study 605 participants recruited within 6 months of first MI randomised to receive the standard dietary advice or the Mediterranean diet and there was 5 year follow up.

There was a marked early separation in the survival curves this is with the end points on MI and CVD death and significant separation in these curves. What I am trying to link back to is what effect the Mediterranean diet has on micronutrient status. In the Lyon Heart study the experimental group reported an increased intake of fruit and vegetables that led to increased vitamin C intake and an increase in measured plasma vitamin C and E. Esposito in the metabolic syndrome intervention reported an increased fruit, vegetable nut and legume intake but they did not assess biomarkers.



Our research group would like to carry out a repeat of the Lyon Heart study in a Northern Europe Population and in an era where pharmacological therapy for cardiovascular disease is quite different to when the Lyon Heart study was carried out. But we consistently have been asked the question will non-Mediterranean countries adopt the Mediterranean diet particularly will Northern Irish people eat a Mediterranean diet. We have done a pilot study to try to see whether we can achieve a change in diet. We took 61 myocardial infarction and unstable angina patients and randomized them to either receive (1) conventional dietary advice received by every patient after MI. This is similar to Mediterranean dietary advice but less specific in terms of fat-intake or (2) Mediterranean dietary advice using a similar way of delivering the dietetic advice but with more contact (they were seen with one month, one week one month and four months after their MI) or (3) Mediterranean dietary advice with behavioural counselling which was the same advice delivered at the same time points so the same intensity advice but this time with a personal adjusting of the dietary advice depending on the person whether they were ready to change their diet. Therefore the dietary advice was not delivered as a whole, but rather

suggestions for change were made depending on whether that person was ready or not. We carried out dietary biochemical assessment at baseline and then at 6 months and then at 12 months after receiving this advice. I am only reporting our primary end point which was change in Mediterranean diet score and we actually saw that at 6 months and at 12 months there were no significant differences between our ways of delivering the dietary advice. We had thought that greater intensity of dietary advice and the more personal way of delivering the dietary advice might influence uptake but in fact it did not seem to. But we did achieve a significant increase in Mediterranean diet score with all of our groups both at 6 months and 12 months no matter what way we delivered the dietary advice. In terms of micronutrient status we observed significant increases in vitamin C status in these two more intensive dietary advice groups. We also saw trends toward an increase in carotenoid status.

Finally briefly looking at analysis of combined health behaviours which has been published by our chair here, professor Khaw - I think that this is a very interesting approach in terms of not looking at an isolated micronutrient not even looking at the whole diet approach but looking at a whole diet and lifestyle approach and it may leads to differences in the way we conduct intervention studies in the future. Carried out in the EPIC Norfolk cohort, 20'000 men and women with no know cardiovascular disease or cancer at the baseline were used in the analysis and a score was calculated - participants scored 1 point for current non-smoking, 1 point for not being physically inactive, 1 point for moderate alcohol intake, and 1 point for having plasma vitamin C that was more than 50 umol per litre - this was supposed to be reflective of a high fruit and vegetable intake. They were followed up for 11 years and for cardiovascular end points there was a significantly increased risk of CVD for those with none of those behaviours compared to those with all four health behaviours. This is a novel and useful approach linking diet and lifestyle factors and disease risk.

To go back to the original question is supplement use equivalent to dietary micronutrient consumption - we need to place this in context by examining the use of vitamin supplements throughout the general population. When the National Diet and Nutrition Survey in the UK was carried out in 1986/87, 17% of women, 9% of men reported taking supplements. By 2000/01 this had gone up to 40% of women and 29% of men reporting taking supplements. I certainly think at the moment that the evidence favours dietary advice to increase micronutrient consumption, e.g. to increase intake of fruit and vegetables etc. And that is supported by the NIH State-of-the-Science Conference Statement on Multivitamin/Mineral Supplements just published last year when they said that "the present evidence is insufficient to recommend either for or against the use of multivitamin minerals by the American public to prevent chronic disease".

In conclusion, the micronutrients supplementation trials published to date have largely been negative therefore the supplementation with isolated micronutrient does not seem to be equivalent to dietary micronutrient consumption. Cardiovascular diseases are multi factorial in origin and complex in aetiology, so our approach in either prevention or treatment must take account of this. We think that consideration of overall diet and lifestyle pattern is likely to be necessary to effectively reduce CVD incidence.

Q&A

PUBLIC: I wonder if I could comment on the folate story with regard to cardiovascular disease. I know that the cancer fields have become controversial, there have been some disturbing findings, what is the chance that this could happen for stroke and coronary heart disease?

JV WOODSIDE: There are no findings so far of an adverse effect on coronary heart disease or stroke end points. In fact there was a meta-analysis published last year showing that in certain subgroups for example those who had low folate and those initially who did not live in countries where folic acid fortification was taking place that there were beneficial effects of B-vitamin supplementation on stroke. I am not aware of any meta-analysis looking at CHD end points but overall again you are seeing the majority of the trials are negative. Therefore currently there would appear to be no effect of B-vitamin supplementation on CHD endpoints with some possibility of small benefit in certain sub-groups for stroke.

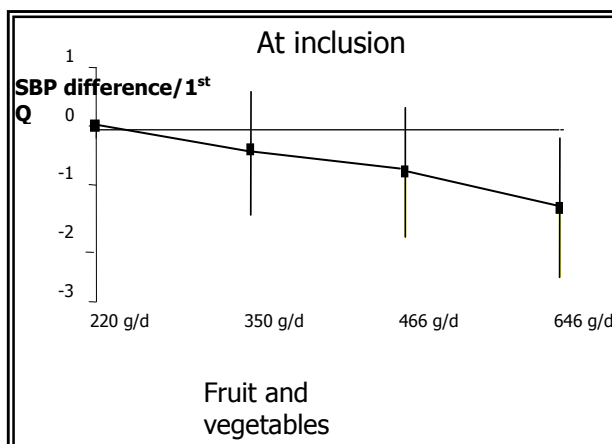
Effects of Fruits and Vegetables on plasma blood pressure: interventions studies

Luc DAUCHET

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Je vais peut être introduire ma présentation en répondant à une question qui a été posée tout à l'heure. On a vu qu'il y avait un certain nombre d'arguments en faveur d'un effet protecteur des fruits et légumes sur les maladies cardiovasculaires, comment passer de ce faisceau d'arguments à une certitude de l'effet des fruits et légumes sur les maladies cardiovasculaires ? D'une façon scientifique, d'une manière générale, la seule manière de démontrer une causalité c'est de faire des essais d'intervention. Pour prouver l'effet des fruits et légumes sur les maladies cardiovasculaires il faudrait faire des essais randomisés d'intervention avec un groupe témoin et un groupe pour lequel on augmente la consommation de fruits et légumes et on voit l'effet sur les maladies cardiovasculaires. Ce type d'étude est très difficile à réaliser, peut-être impossible à réaliser ; par contre on peut étudier dans des essais d'intervention l'effet des fruits et légumes sur la pression artérielle avec des résultats qui sont obtenus à beaucoup plus court terme avec des populations plus faibles.

Comment étudier la relation entre la consommation des fruits et légumes et la pression artérielle ? La première chose est de vérifier que cette relation existe dans les études d'observation. Ce qui permet de retrouver une association mais qui ne prouve pas l'effet des fruits et légumes, il peut y avoir quantité de facteurs de confusion dont on a déjà parlé dans les exposés précédents. La seule façon d'établir un lien de causalité c'est de faire des études randomisées et des essais d'intervention. On ne peut évidemment pas tester l'effet global des fruits et des légumes entiers comme on testerait des vitamines ou des médicaments contre placebo en double aveugle mais on peut quand même faire des essais d'intervention contrôlés avec un groupe témoin et un groupe d'intervention. On va voir qu'il y a deux grands types d'essais qui sont réalisés soit avec une alimentation complètement contrôlée soit avec des interventions et des conseils nutritionnels.



Tout d'abord les études d'observation, je vais vous montrer quelques exemples, il y en a de nombreux autres. Par exemple ici on a en France dans la population de SU.VI.MAX une inclusion dans l'étude, les grands consommateurs de fruits et légumes de l'étude avaient une pression artérielle qui était plus basse en moyenne que les faibles consommateurs avec une différence relativement

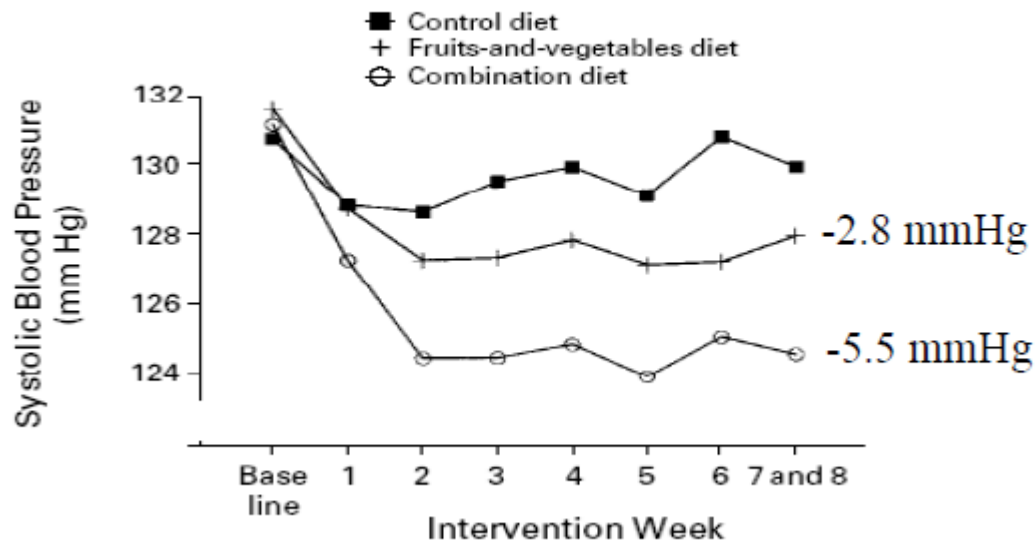
modérée mais significative de 1,4 mmHg (millimètre de mercure).

Il est à noter qu'au cours du suivi la pression artérielle des personnes qui consommaient beaucoup de fruits et légumes a moins augmenté que celles qui en consommaient peu, elle a augmenté de 2 mmHg en moins que ceux qui en consommaient peu ce qui indique également un effet ou du moins une association à long terme.

On retrouve des résultats similaires aux Etats-Unis dans la cohorte CARDIA où on retrouve une association entre consommation d'aliments végétaux et risque de survenue d'hypertension. Après 15 ans de suivi, le risque de survenue d'hypertension était diminué de 30% chez les grands consommateurs de produits végétaux. C'est une association que l'on trouve dans des populations très différentes. Un dernier exemple : dans une population de femmes iraniennes où la proportion de femmes hypertendues est également plus faible chez les grandes consommatrices de fruits et chez les grandes consommatrices de légumes. Donc des résultats qui sont trouvés de manière consistante dans les études d'observation. On voit donc une association entre consommation de fruits et légumes et faible pression artérielle dans l'étude d'observation. Néanmoins comme il s'agit d'observation il peut y avoir des facteurs confondants, quantité de facteurs liés à la consommation de fruits et légumes qui peuvent être d'autres consommations alimentaires ou d'autres habitudes de vies qui peuvent expliquer cette association d'où la nécessité de faire des études d'intervention.

Le premier type d'intervention que je vais vous citer sont les études portant sur des régimes complètement contrôlés où on contrôle totalement l'alimentation des sujets qui sont inclus dans l'étude et qui sont tirés au sort dans les différents groupes. Ce type d'étude est très difficile et très lourd à mener, il y en a relativement peu, peut-être des nouvelles qui vont arriver. La principale et la plus connue est la « DASH Study » (Dietary Approach to Stop Hypertension). Dans cette étude, 450 sujets ayant une pression artérielle normale, haute ou une hypertension modérée ont été inclus. Ils ont été tirés au sort en trois groupes et devaient chacun suivre un régime, une alimentation différente pendant 8 semaines et chacun des sujets devait au moins consommer un repas sur le lieu du laboratoire et recevait une glacière avec le reste de ce qu'il devait consommer dans la journée. Les personnes devaient consommer ce qu'on leur donnait et rien que ce qu'on leur donnait, ce qui était quelque chose de très contraignant à la fois pour l'investigateur et pour le sujet. Cette étude DASH a évalué trois régimes : un régime témoin qui correspondait à peu près au régime américain moyen, un régime fruits et légumes correspondant au même régime que le groupe témoin mais avec une consommation plus importante de fruits et légumes en moyenne d'environ 10 fruits et légumes par jour et enfin un régime combiné qui incluait une consommation de fruits et légumes mais également de produit laitiers pauvres en graisse et un apport réduit en graisse saturée. Cette étude a montré qu'après 8 semaines de suivi la pression artérielle systolique était diminuée de 2,8

mmHg dans le groupe fruits et légumes par rapport au groupe témoin. Il y avait des résultats similaires sur la pression artérielle diastolique.



Les sujets ont été tirés au sort donc la seule chose qui puissent distinguer le groupe témoin du groupe fruits et légumes c'est la consommation de fruits et légumes. Ce qui nous donne quasiment la preuve de l'effet des fruits et légumes sur une diminution de la pression artérielle. On n'est pas tout à fait au même niveau de preuve qu'un essai randomisé en double aveugle contre placebo mais on y est presque. Il est à noter que le régime combiné avait un effet plus important que le régime fruit et légumes d'où l'importance d'autres éléments d'alimentation que les fruits et légumes. Cette étude DASH nous donne donc une preuve expérimentale de l'effet des fruits et légumes sur la pression artérielle. Néanmoins, on est là dans des conditions expérimentales avec des régimes totalement contrôlés donc une intervention qui ne peut pas être appliquée au grand public. Ce qui est intéressant de savoir est : est-ce que des recommandations qui inciteraient les sujets à augmenter leur consommation de fruits et légumes pourraient avoir un effet sur la pression artérielle ?

On arrive à un deuxième type d'étude d'intervention qui a été réalisé concernant les fruits et légumes. On n'est plus là dans un régime totalement contrôlé où l'on fournit l'alimentation aux sujets mais c'est l'effet de conseil alimentaire visant à augmenter la consommation de fruits et légumes. Il y a beaucoup d'essais portant sur les interventions alimentaires, peu portent exclusivement sur la consommation de fruits et légumes. La principale est l'étude d'Oxford dans laquelle 700 sujets ont été inclus et tirés au sort entre un groupe d'intervention et un groupe témoin. Le groupe d'intervention était encouragé à augmenter la consommation de fruits et légumes et il recevait des conseils nutritionnels pendant 25 minutes à l'inclusion de l'étude ainsi

que des aimants à mettre sur le frigo et un livret pour mesurer leur alimentation en fruits et légumes et un rappel téléphonique à deux semaines et un courrier à trois mois, quelque chose d'applicable au grand public ou au moins à certaines populations. Le groupe témoin, il leur a été demandé de ne rien changer à leurs habitudes. Les résultats de cette étude ont montré au bout de 6 mois de suivi une augmentation de la consommation de fruits et légumes dans le groupe d'intervention donc d'un peu plus d'1 portion, un peu moins d'une portion et demie, 1,4 portion. Par contre dans le groupe témoin il n'y a pas eu d'évolution de la consommation de fruits et légumes tel qu'il leur a été demandé. La différence de consommation entre les deux groupes était donc d'1,3 portion de fruits et légumes. On est dans une différence, vous voyez, qui est beaucoup plus faible que ce qu'on a pu obtenir dans l'étude DASH puisque le régime était totalement contrôlé. Malgré cette différence relativement modérée, un effet a été retrouvé sur la pression artérielle avec une diminution significative de la pression artérielle systolique à 3,4 mmHg dans le groupe d'intervention par rapport au groupe témoin et une diminution également significative de la pression artérielle diastolique. Cette étude nous démontre l'efficacité à moyen terme, de l'incitation à consommer plus de fruits et légumes dans la population, sur la pression artérielle.

F & V in free living individual : The Oxford Study

Self-reported intake of F&V, blood pressure and body weight

	n	Baseline, mean (SD)	Change at 6-months' follow-up, mean (SD)	Between-group difference in change (95% CI)	p for adjusted difference
Self-reported daily intake of fruit and vegetables (portions)					
I	329	3.4 (1.7)	1.4 (1.7)	1.3 (1.1 to 1.6)	<0.0001
C	326	3.4 (1.5)	0.1 (1.3)		
Systolic blood pressure (mm Hg)					
I	344	130.2 (19.7)	-2.0 (13.5)	3.4 (1.3 to 5.5)	<0.0001
C	346	129.3 (19.6)	1.4 (14.6)		
Diastolic blood pressure (mm Hg)					
I	344	79.2 (11.4)	-1.6 (8.7)	1.4 (0.1 to 2.7)	0.02
C	346	79.9 (11.9)	-0.3 (8.7)		
Weight (kg)					
I	344	76.1 (13.8)	0.6 (2.6)	0.0 (-0.3 to 0.5)	0.1 (-0.4 to 0.6)
C	346	75.6 (14.9)	0.6 (2.6)		

I=intervention group, C=controls. *Adjusted for baseline value and sex.

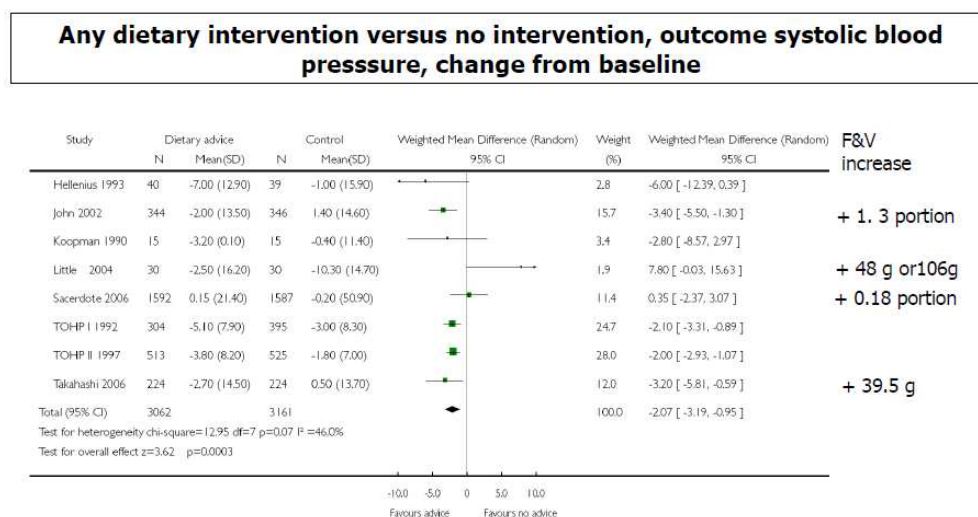
John et al Lancet 2002

Une deuxième étude qui ne porte pas spécifiquement sur les fruits et légumes qui est « The Women Health Initiative study », mais qui nous apporte des informations intéressantes en raison de la très grande taille de cette étude qui porte sur à peu près 50 000 femmes avec une intervention qui consistait à augmenter la consommation de fruits et légumes et de céréales, de réduire l'apport en graisse avec des formations en groupe qui ont été réalisées auprès des sujets. Les groupes témoins recevaient

simplement le guide d'alimentation pour les américains. Les résultats de cette étude ont montré, après 1 an et 6 ans de suivi, une augmentation de la consommation de fruits et légumes dans le groupe d'intervention par rapport au groupe témoin qui est du même ordre de grandeur que celle retrouvée dans l'étude d'Oxford avec un peu plus d'une portion par jour. Par contre, les résultats portant sur la pression artérielle sont plus décevants. Il y a une diminution significative de la pression artérielle dans le groupe d'intervention par rapport au groupe témoin mais cette diminution est très faible 0,17 mmHg donc n'est significative que grâce à la taille très importante de l'échantillon. Pourquoi ne retrouve-t-on pas les mêmes résultats que dans l'étude d'Oxford ? Difficile de répondre à cette question et on peut émettre plusieurs hypothèses. Une des choses intéressantes à constater est que la pression artérielle a en réalité diminué dans le groupe d'intervention de 2 mmHg ce qui est à peu près du même ordre de grandeur de ce que l'on trouvait dans l'étude d'Oxford mais elle a diminué aussi dans le groupe témoin. Peut être qu'il y a eu des changements d'habitudes dans le groupe témoin du fait de rentrer dans l'étude, c'est difficile d'en juger.

Il y a d'autres essais de plus faible taille portant sur les études d'intervention nutritionnelle et la pression artérielle systolique. Il ya une méta-analyse récente qui a été réalisée par le groupe COCHRAN. Quasiment aucune ne porte exclusivement sur les fruits et légumes, toutes ne portent pas sur les fruits et légumes et quand il y a une incitation à consommer plus de fruits et légumes, la difficulté c'est d'arriver à obtenir une différence entre le groupe d'intervention et le groupe témoin qui soit suffisamment importante. (...) d'où la difficulté parfois d'interpréter le résultat de ces études.

F & V in free living individual : Other intervention studies



Brunner et al Cochran collaboration 2008

On a vu que les essais avec des régimes complètement contrôlés nous prouvent l'effet des fruits et légumes sur les maladies cardiovasculaires. Les essais portant sur les interventions nous montrent que cet effet peut être obtenu par des interventions auprès des sujets, auprès des patients, auprès du grand public. Et, les études d'observation sont également intéressantes car elles nous permettent d'avoir les informations sur une durée de suivi plus longue et sur une population plus importante. L'ensemble de ces résultats sont cohérents et montrent les effets de la consommation des fruits et légumes sur la pression artérielle.

Alors pourquoi les fruits et légumes diminuent-ils la pression artérielle ? Il y a évidemment de nombreuses hypothèses sur les constituants des fruits et légumes. Le potassium joue un rôle probablement important. L'effet des antioxydants est plus discuté, on pourrait citer les fibres, on pourrait évoquer l'effet combiné des constituants des fruits et légumes. Il y a l'effet propre des fruits et légumes et également probablement un effet de substitution qui n'est pas négligeable. Évidemment, quand on demande aux personnes d'augmenter leur consommation de fruits et légumes ça se fait au détriment d'autres aliments. L'effet positif vient-il du fait d'augmenter la consommation de fruits et légumes ou de consommer moins d'autres aliments ? L'exposé de Barbara ROLLS nous a bien montré ce matin que quand on augmente la consommation de fruits et légumes on modifie le reste du comportement alimentaire. Donc, ici, les études d'intervention ne permettent pas parfaitement de trancher entre ces deux effets puisque même dans l'étude DASH les fruits et les légumes étaient remplacés par des snacks dans le régime témoin pour atteindre le même niveau calorique. Après tout, que ce soit l'effet propre des fruits et légumes ou un effet de substitution peu importe, ce qui compte c'est le résultat final pour les sujets d'où l'intérêt des fruits et légumes pour diminuer la pression artérielle.

Enfin, les recommandations sur les fruits et légumes ne doivent pas faire oublier les autres recommandations habituelles pour la pression artérielle. On a vu dans le régime DASH que l'effet du régime combiné était supérieur à celui des fruits et légumes. Une autre étude menée par la même équipe que celle de DASH a montré qu'un effet additif de la diminution de la consommation de sel par rapport à celui du régime DASH et enfin dans l'étude PREMIER qui a comparé les recommandations portant sur les recommandations habituelles donc perte de poids, diminution de consommation de sel et diminution de la consommation d'alcool avaient des résultats qui n'étaient pas significativement différents de celles portant sur les régimes habituels plus le régime DASH. Donc, la consommation de fruits et légumes est un apport supplémentaire dans la lutte contre la pression artérielle mais ne doit pas faire oublier les autres recommandations.

En conclusion, il y a une relation dans les études d'observation de manière générale entre consommation de fruits et légumes et pression artérielle. Les études avec des

régimes contrôlés montrent les effets des fruits et légumes sur la pression artérielle. Et enfin les études portant sur les recommandations montrent l'effet de ces recommandations et de ces incitations et conseils pour manger plus de fruits et légumes sur la pression artérielle. Donc un effet démontré de manière expérimentale de l'augmentation de la consommation de fruits et légumes sur la pression artérielle.

Q&A

KT KHAW: I think like Dr WOODSIDE also suggested, perhaps one of the possibilities if you can not do the large scale end point trials is to do more mechanistic studies looking at intermediate risk factors like blood pressure or endothelial function of inflammation. Do you think there is one way we can go to strengthen the evidence as requested?

L DAUCHET: Oui tout a fait, c'est la diapositive que nous a montré le Dr He tout à l'heure où elle concluait un effet de causalité. Effectivement, à défaut d'avoir un essai randomisé qui prouve les effets des fruits et des légumes il faut additionner les arguments qui sont des arguments épidémiologiques. Est-ce qu'on trouve la relation de manière générale ? Est-ce que cette relation est plausible au niveau biologique et pour ça, il y a les classiques critères de Hill pour essayer d'argumenter une causalité quand on ne peut pas avoir des faits randomisés. Tout à l'heure le Dr He nous a bien montré ça, on a un certain nombre d'arguments, mais évidemment on n'arrive pas à la preuve absolue, mais en accumulant les arguments on peut arriver à suffisamment de conviction pour recommander de consommer plus de fruits et légumes.

PUBLIC (Eric LEMERCIER, Groupe MedAlliance Europe, Producteur de Fruits et légumes) : Je vous ai bien entendu et très bien compris. Est-ce que ça peut justement un peu plus expliquer un petit peu le paradoxe qu'on a aujourd'hui ? C'est à dire que les Etats du monde entier mettent en avant la consommation des fruits et légumes par le biais de la communication. Je parle déjà principalement pour la France où on essaie de faire dans ce sens, je suppose que c'est aussi pareil dans les pays du monde entier. Est-ce qu'il n'y a pas un paradoxe entre le fait qu'on n'arrive pas aujourd'hui à apporter comme vous le disiez des preuves convaincantes et d'ailleurs on le voit bien nous, au niveau des produits qu'on doit apporter au consommateur en tant que fruits et légumes, c'est ne serait-ce que les allégations qui aujourd'hui reste encore très vastes. On n'arrive pas à informer je dirais, le consommateur aujourd'hui des raisons d'en consommer 5 par jour, oui mais pourquoi ? Pour l'instant on l'informe de la situation mais on n'informe pas spécialement du pourquoi de cette consommation tout ça parce que les allégations sont très floues aujourd'hui. Je relève d'ailleurs, sauf erreur de ma part, que l'AFSSA ne sont pas présents aujourd'hui parce qu'ils auraient peut-être pu nous en parler un peu. Le fait de ne pas informer aujourd'hui correctement le consommateur, lui ne modifiera en aucun cas sa consommation. Le fait de dire il faut consommer oui, pourquoi ? Et j'ai beaucoup

apprécié notamment le Dr He justement de par ses propos qui avait un peu plus de véracité dans le sens où effectivement, il y a une cause, il y a un effet. Même s'il n'est pas rempli à 100% on sait pertinemment que la consommation de fruits et légumes dans le monde entier ne pourra faire que du bien, on n'est pas non plus dans un mensonge.

L DAUCHET : C'est toute la difficulté de passer de la recherche scientifique à l'application et au message. Au niveau de la recherche scientifique on ne peut que citer l'ensemble des arguments que nous avons, qui est un faisceau d'arguments quand même relativement solide. On ne peut pas dire « c'est totalement prouvé » si on n'a pas la preuve. On a un faisceau d'arguments relativement solide. Après, la communication auprès du grand public est difficile, ça devient autre chose, on ne peut pas communiquer des choses aussi complexes. Je pense qu'on n'a pas attendu d'avoir des preuves pour agir, il y a quand même pas mal de chose qui sont faites pour consommer plus de fruits et légumes, le message « consommer 5 fruits et légumes par jour » est quand même bien reconnu dans la population. Je ne sais pas si on peut aller beaucoup plus loin.

PUBLIC (Eric LEMERCIER, Groupe MedAlliance Europe, Producteur de Fruits et légumes) : J'ai plutôt l'impression qu'en France on se base sur des chiffres qui environnent les 320 g, je fais peut-être un petit peu erreur au niveau de la dizaine de gramme, alors qu'on sait pertinemment que en France on a une surconsommation chez les seniors qui avoisinent plutôt les 600/700 g, une consommation quasi inexistante chez les jeunes parce qu'on est dans une génération aujourd'hui de fast-food et de boissons gazeuses. Ces chiffres donnent une moyenne, on sait aujourd'hui que l'alarme doit être tirée non pas pour les seniors mais plutôt pour les jeunes qui arrivent qui sont déjà une génération de jeunes et ceux qui vont arriver derrière. On sait que là on est en sous-consommation et on ne peut pas tirer d'une moyenne pour mettre en place des faits et des choses à réaliser. Si vraiment on veut aller dans la profondeur du problème, on voit bien qu'effectivement en France la consommation chez les jeunes est de 0 et à présent je crois 0.1 et c'est insignifiant sur la base de produits frais bruts. On peut aussi dissocier les légumes et les fruits en 4^{ème} ou en 1^{ère} gamme. Là on n'est pas sur des faits qui me semblent vraiment réels où on peut entamer notamment des négociations que ce soit avec les pouvoirs politiques qui effectivement, de leur vue à eux ne peuvent pas être convaincus comme ils devraient l'être quand on voit comment l'OMS tire le signal d'alerte au niveau mondial. On a l'impression que la locomotive va vite mais que certains wagons n'arrivent pas à prendre la bonne vitesse. Moi qui ait certainement beaucoup moins d'ancienneté que vous dans ce domaine de fruits et légumes, c'est vrai qu'il y a beaucoup de choses qui m'interpellent dans ce que j'entends, dans ce que je lis, dans ce que je peux voir.

L DAUCHET : Je pense que c'est un peu compliqué. Ce que vous essayez de nous faire dire c'est de dire voilà, on a la preuve absolue des effets des fruits et légumes

pour pouvoir faire bouger les politiques et que ça aille vite. On peut vous dire on a beaucoup d'arguments qui sont convaincants, on ne peut pas vous dire plus que ce qu'on a mais pour autant il est vrai qu'il ne faudrait pas attendre. On peut parler du tabac, si on avait attendu d'avoir la preuve absolue pour le tabac, on aurait réagi beaucoup trop tard donc ce n'est pas pour autant qu'il ne faut pas agir. Après, c'est un problème de décision politique qui doit décider en fonction des informations qu'ils ont mais on ne peut pas leur donner plus que ce que l'on a.

KT KHAW: I think you made a very clear illustration of why we are bringing together the scientific evidence, and the rest of this meeting is about how we translate the scientific evidence into policy and action which I think many of the people here will have much more expertise on.

PUBLIC (Serge HERCBERG): Je voudrais juste fournir quelques éléments de réponse à la question posée par mon voisin. Je crois qu'aujourd'hui en termes de politique nutritionnelle de santé publique, notre problème n'est pas tant d'arriver à convaincre la population que manger des fruits et légumes est bon pour la santé, je crois que les arguments qui sont tout de même repris et donnés sont suffisants pour que les campagnes qui sont faites puissent avoir un impact dans la connaissance. Notre problème n'est pas simplement de convaincre, c'est de pouvoir arriver, les problèmes sont plus en termes d'accessibilité, en termes de pouvoir d'achat, en termes disons d'autres facteurs. Les campagnes qui sont faites en France ont montré qu'elles étaient bien connues et reconnues, le public sait que manger des fruits et légumes est bon pour la santé, la difficulté qu'il y a c'est de traduire des connaissances en application pratique. Je crois que c'est un des points qui va être largement vu dans les jours qui viennent. Je crois que la réponse n'est pas tant de l'affirmation scientifique qui serait suffisamment convaincante pour faire bouger les comportements, les comportements doivent bouger par d'autres éléments et ce sont souvent des facteurs d'environnement sociologique, culturel, économique qui sont plus en cause que la connaissance simplement du rôle des fruits et légumes.

KT KHAW: I think that is why we are all here at this meeting to understand what we can do to translate the evidence to practice.

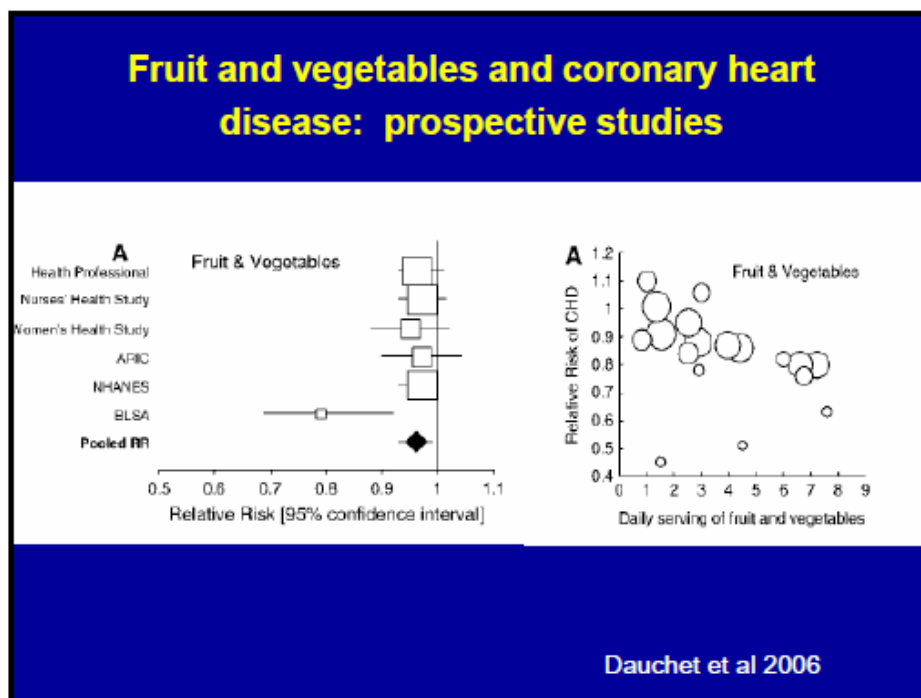
F&V and cardiovascular disease risk: what should we do?

Kay-Tee KHAW

Clinical Gerontology, University of Cambridge, UK

I will summarize some of the discussion and raise some of the issues that have perhaps already been raised by our audience in terms of how we deal the evidence. In terms of assessing the evidence it is a combination of the wealth of evidence including experimental and metabolic studies. Of course, the hard evidence may be the randomized trials and control trials with hard clinical end points but these are the hardest types of evidence to obtain.

The strength of the evidence relies therefore not only on biological plausibility but on how strong and consistent the evidence is across different human populations because of course we are trying to make generalised recommendation globally not just to our particular populations. We have heard earlier from Dr He and other speakers about the observational data. This is the Dr Dauchet's meta-analysis you have seen earlier suggesting a fairly consistent relationship in observational studies between fruit and vegetable intake and coronary heart disease.



This is Dr He's meta-analysis from the Lancet showing very consistent finding also for stroke and a dose-response relationship in the higher intake of fruits and vegetables associated with greater risk reduction in stroke. We also heard from Dr Woodside and I think that is an issue raised also by Dr Milner in his questions about understanding mechanisms much better. Why is it? What are the biological reasons

that fruit and vegetables may have an impact on cardiovascular risk? And we heard a huge amount about some of the many potential biological mechanism such as the inflammatory action as well as the blood pressure lowering factors that may be related to many of the different component of fruits and vegetables. And fruits and vegetables have hundreds of bio active components. I think it is rather intriguing that most of the early trials perhaps focussed on the antioxidant vitamins when potentially there are many other biological factors that could be looked at that perhaps we haven't thought enough about. We have been a little set back perhaps because some of these single supplement trials that we have been chosen may not have selected appropriately the nutrients in fruit and vegetables that may be responsible and may need far more biological understanding of which of the components may have bioactive effects on cardiovascular risk.

We heard from Dr Woodside about the isolated trials and we also heard a little bit about the possible randomised trials including fruit and vegetables but there are no isolated trials with fruit and vegetables alone and that is our difficulty in term of dietary changes. You have seen this before, the univariate supplemental trials on beta-carotene, vitamin E have not been encouraging. Even for folate, despite the observational studies suggesting benefits for stroke, secondary prevention trials for coronary heart disease suggested perhaps an adverse slightly increase for supplementation folate so, again discouraging in term of the single factor supplementation. And, as Dr Woodside has suggested, some of the explanation may be that single supplements taken way beyond their physiologic doses may actually have adverse effect, pro-oxidant effect for example. Different isoforms, of, beta-carotene, trans or cis beta-carotene may also have different biological actions so maybe the compounds in foods may not be the same as those used in supplements. Additionally there may be interaction with other factors in free living populations.

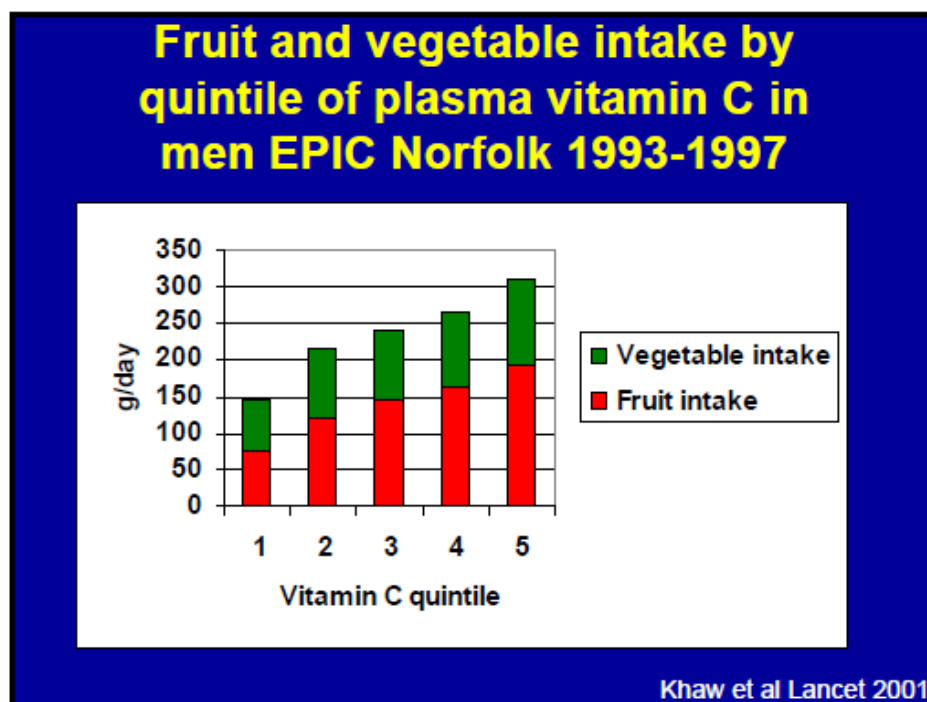
What about the food based trials? I suppose the elephant in the room is the Women Health Initiative, this huge trial done in the States which was targeted at low fat but you can see did not really change cardiovascular disease risk.

Now why, in this particular trial was there not any observed effect?

Apart from lowering fat it was also meant to increase fruit and vegetable intake. One suggestion was that it was too short term, it is too late to intervene, and it was not specific at least in term of the fat because all the trials that have targeted fat that have had an effect on coronary heart disease risk have changed the poly unsaturated to saturated fat ratio. The Women Health Initiative did not change that it only lowered total fat. Another explanation may be too little change, particularly for the dietary interventions and in this context and may be in the American context when you ask people to increase fruit and vegetables they may not increase the particular fruits and vegetables that may have most direct impact on health. Again this returns to an issue, is it cruciferous vegetables or if individuals increase foods like peas and sweet corn may that does not have the same impact as green leafy vegetables. We do not

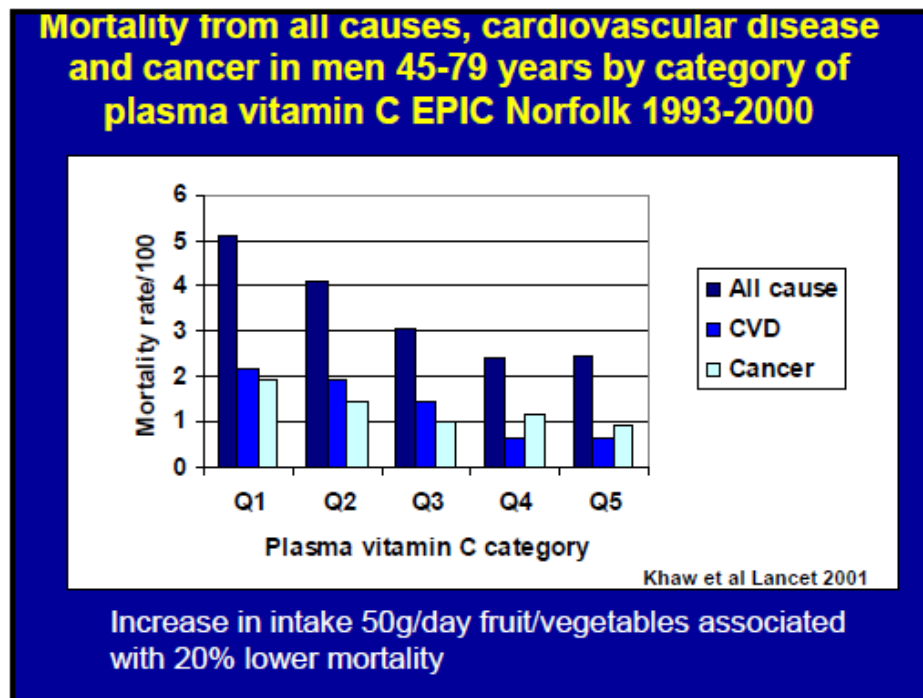
know whether the American context increasing fruit and vegetables intake as it was self reported might not have the same impact in different communities where the range of fruit and vegetables may be very different. Just to emphasize, the change in fruit and vegetables self reported in this intervention study was really very small and the average baseline was still below the 5 servings a day that is generally recommended. So, on average they did not achieve the target, fruit and vegetables intake that might be used in dietary recommendations.

One question that was raised yesterday by Dr Schatzkin was perhaps we are not measuring fruit and vegetables adequately and perhaps we should have better biomarkers of fruits and vegetables intake. I think Dr Jenab is going to talk about it this afternoon in relation to cancer risk but this was one of the reasons we tried to use different biomarker for fruits and vegetables intake rather than relying on self report which we know is really differential according to social class, education etc and maybe biased. We used plasma-vitamin C not because we believe vitamin C is the bioactive responsible compound in fruits and vegetables but because human do not manufacture vitamin C so the only source of vitamin C in our blood is from dietary intake that is primarily fruits and vegetables. You can see this relationship between vitamins C, blood levels and fruits and vegetables intake in our population in Britain. So vitamin C is a good biomarker and I am not talking about supplementation because in the analysis we excluded people who were taking vitamin C supplementation.



We used quintiles because this is a demonstration of usual free living population intake of food and I think the point that we wanted to make here was that it is not

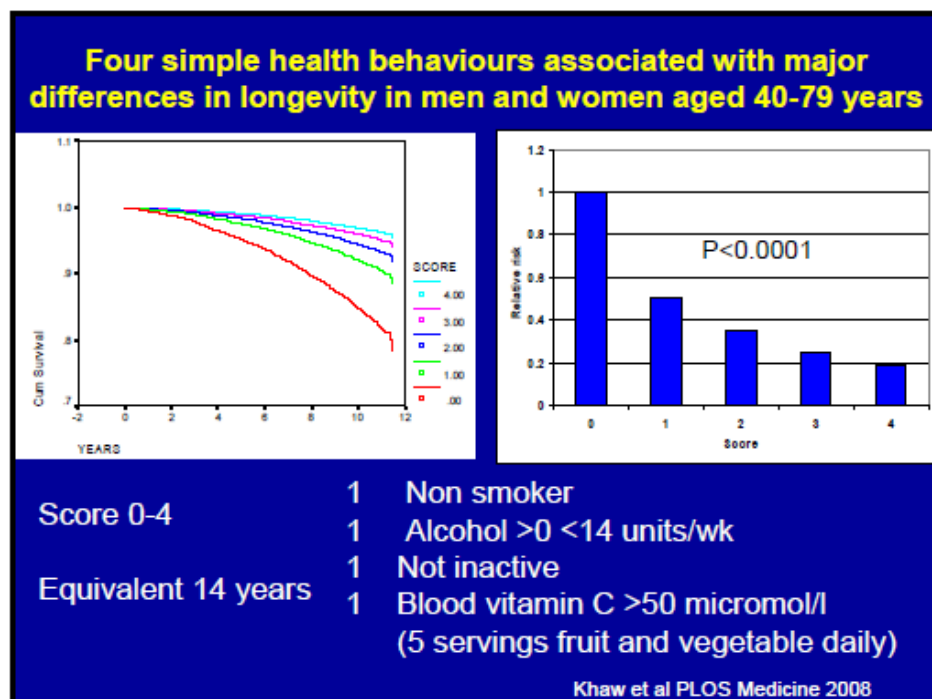
just the relationship with cardiovascular disease that we think is relevant for public health, people are not just interested in that, they are interested in total health. You can see the very strong relationship with total mortality, people who are in the top 20% or top 40% for plasma vitamin C the highest intake of fruits and vegetables not only have half of cardiovascular mortality but also half the total mortality compared to the people in the bottom 20%.



The magnitude of this was an increase of about 1 serving a day of fruits and vegetables associated with the 20% lower mortality. So within the normal habitual range in a free living population there is demonstrable relationship with mortality. But of course, we go back to the trials, and we heard again about the Lyon Heart Study which showed a 70% lower mortality. This was done in France so maybe it is a different pattern of fruits and vegetables because what happened in the Lyon study was in the subset where they did biomarkers, they were able to document apart from reported diet, biological change, a rise in the vitamin C an indicator of fruits and vegetables intake and interestingly enough a decrease in white blood cell count, a marker of inflammation, but without a big impact on the classical risk factors blood pressure and cholesterol with Mediterranean diet. This was, of course, not only associated with the change in type of fat but also with an increase in fruit and vegetables intake as we have heard from the earlier speakers.

One of the big criticisms in making any sort of lifestyle recommendations is firstly that people who eat a lot of fruits and vegetables also have other health behaviours, they are more likely to be physically active, they less likely to be smokers so they are all correlated. Fruits and vegetables is just a marker of a healthier lifestyle. To

address this, we did a health behaviour score where each of these lifestyles were independently scored so that addresses the confounding issue of lifestyle. The second is that often it is argued these behaviours are not feasible because we cannot possibly eat all this fruits and vegetables or do all these physical activities so we wanted to address feasible behaviours that were within the reality of free living populations and as you can see these are the scores: 1 point for each of these 4 healthy behaviours, two of them nutritional, one: moderate alcohol intake and the second is fruits and vegetables about 5 portions a day as indicated by our biomarker. Physical activity, not difficult, it was not being totally sedentary so anything beyond a total couch potato was one score for physical activity and of course, non smoking.



You can see the additive relationship of these very small differences in lifestyle. The people who had four behaviours, the relative risks across had one fifth the subsequent mortality and these are the survival curves according to the number of health behaviours equivalent if you practised 4 four healthy behaviours to be 14 years younger in term of chronological age for life expectancy compared to 0 health behaviour. 25% of our population had four health behaviours so a very small difference and feasible change seems to have impact on health outcomes.

What does it mean in terms of recommendations? We have heard questions about: how good is the evidence and is it enough to make public policy recommendations? We have heard from many speakers already about the huge burden of cardiovascular disease in the world and the biggest burden comes from developing countries. We also heard about the huge impotence to prevent cardiovascular disease but clearly putting the world population on blood pressure lowering medication is not a feasible public health policy. We need to understand what public health interventions might

have substantial impact on moderating the future epidemic of cardiovascular disease particularly in low and medium income countries where individual interventions are not feasible. We need public health interventions.

And we know that cardiovascular disease is hugely preventable, we only have to look at time trends, look at the US, this is a period of just 40 years this is not genetic differences these are huge environmental changes which have affected different populations differently. The US shows a precipitate decline in cardiovascular disease; Britain started lower but declined later but they also had a decline; Japan and Spain, South European countries have had low rate and they continue to decline but in sharp contrast; Mauritius and Russia, both examples of emerging economies have had this massive increase. If we could simply turn around some of those trends to reflect those that we see in some of the other countries we will be talking about as Dr He highlighted millions of potential events prevented in a year.

I come back to a statement that was made by Austin Bradford Hill in relation to smoking. How many of us believe that smoking is not causally related to health? I should think nobody. Smoking evidence was not based on any randomised trials whatsoever. When talking about the need to act in the absence of randomized trials we know we can never get a 100% certainty but certainly the evidence for fruits and vegetables is about as good as any other evidence that is available and there is no evidence so far at all that there is any harm from changing fruit and vegetables intake. As we heard from our earlier speakers there is a huge amount of evidence much more than for many other nutrients that high fruits and vegetables intake is beneficial not only for cardiovascular disease but for total health, for total mortality. The magnitude of a feasible change about 5 servings daily which is totally achievable and we heard from Barbara Rolls about how we can achieve that is about 20 to 30% lower cardiovascular disease risk and there is substantial potential public health impact particularly in the context of other health behaviours. So we really emphasize that the WHO global strategy on disease recommends an increase in fruit and vegetables intake within a totally achievable range as well as some of the other dietary changes and of course stopping smoking and increasing physical activity.

What will be interesting, I think, from the rest of this conference is to understand how perhaps we can achieve some of these changes.

SESSION 6

F&V CONSUMPTION TO REDUCE CANCER RISK

Chairs: **A. Schatzkin**

- Introduction. **A. Schatzkin**
- Changing dietary habits after a cancer: a systematic review of the literature. **T. Norat**
- Biomarkers of F&V intake and cancer risk. **M. Jenab**
- Vegetables and genetics: feeding studies in cancer prevention. **J. Lampe**
- What about mechanisms? **J. Milner**

Introduction

Arthur SCHATZKIN

National Cancer Institute, Division of Cancer Epidemiology and Genetics, Bethesda, Maryland, USA

(...) I will make a couple of very brief introductory remarks. We heard this morning very strong evidence that fruit and vegetable consumption plays an important role in obesity and in cardiovascular disease. Now, it is not necessarily true that fruit and vegetables have to be good for everything. They do not necessarily make you live to be 125, they are not necessarily going to make your kids get higher paying jobs, they won't necessarily improve you tennis performance. It would be wonderful if fruit and vegetables intake, in fact, did reduce your risk of cancer, but as you heard that has been a problematic field and the evidence is controversial, inconsistent at times, and changing over the last several years. Even if it were true that fruits and vegetables do not play a substantial role in malignant disease as you have heard, they play a substantial role in other chronic non-communicable diseases.

With our four speakers, we are going to approach the fruit and vegetables cancer problem from several different levels. We are going to have Dr Tereza Norat presenting on cancer survivors. She will look at the epidemiologic evidence that fruit and vegetables consumption can play a role in long term prognosis for those who have been diagnosed with cancer. Then we have Mazda Jenab, who is going to talk about the important role of biological markers in relation to fruit and vegetable intake. He will discuss some of the difficult issues about how well we measure what people eat, how much fruit and vegetables they consume. Dr Johanna Lampe will be talking about feeding studies, with a particular emphasis on studies of the role of polymorphisms in metabolizing genes. She will discuss how understanding fruit and vegetables intake in relationship to chronic disease and cancer can be enhanced by these kinds of nutrition-gene studies. Finally John Milner will talk about underlying mechanisms and the importance of looking at genetically susceptible subgroups.

Changing dietary habits after a cancer: a systematic review of the literature

Teresa NORAT

Division of Epidemiology, Public Health and Primary Care, Faculty of Medicine Imperial College, London, UK

(...) I will base my talk on the literature review that was conducted for the global report of the American Institute for Cancer Research and Work Cancer Research Fund which was published last year and this year it includes detailed chapter with an extensive review of clinical-trials on dietary interventions and nutritional-based interventions on cancer survivors.

Cancer survivors is anyone who has been diagnosed with cancer, and there is a continual stage for cancer survivors that go from previous treatment to during treatment, recovering treatment, preventing recurrence, second primaries and living with advanced cancer and each of these stages have different requirements. It is importance to notice that there are important differences between nutritional research for cancer prevention and after cancer prevention. Currently, the most important difference is in the amount of evidence that has been collected. We have strong and substantial evidence that nutrition is related with cancer prevention and hundreds of studies that support these evidences while now we still have limited evidence of the relationship of nutrition with endpoint after cancer diagnosis. Another important difference between prevention and after cancer studies is that in the population in general there is modest interest in behavioral change for cancer prevention while in cancer patients there is keen interest in behavior change for improvement of quality of life, for improvement of result of treatment, for prolonging life expectancy. An the other important difference is that there is little commercial interest in studies on cancer prevention while there is much more commercial interest in studies on cancer survival mainly for the further applications in dietary supplements.

Patients, cancer survivors are highly motivated to seek information about food choices, physical activity and dietary supplements however in fact few survivors are actually making these changes.

American Cancer Society's SCS-II (N=9,105)
Cancer Survivors' Adherence to Lifestyle
Recommendations

Cancer Group	Physical Activity (%)	5-A-Day (%)	Smoking (%)
Breast	37.1	18.2	88.1
Prostate	43.2	15.6	91.6
Colorectal	35	15.9	91.3
Bladder	36	16.3	82.6
Uterine	29.6	19.1	91.1
Skin melanoma	47.3	14.8	89

Abbreviation: 5-A-Day, consumed five servings of fruits and vegetables each day.

Blanchard et al. Journal of Clinical Oncology, 2008; 26(13) pp. 2198-2204

This is a study that was conducted by the American Cancer Society in more than 9'000 individuals and they investigated the adherence to lifestyle recommendations. In fact, non smoking was the recommendation that was made by most of the individuals the cancer survivors included in the study but other lifestyle behaviour like physical activity and the recommendation of 5 serving of fruits and vegetables were made by a limited number of cancer survivors. Then the question would be: Is adherence to lifestyle behaviour related to health-related quality of life? This was also investigated in this study where the researchers related health quality score which is based in physical and mental domains with the adherence to guidelines for cancer prevention. We could see that the mean score was higher for individuals that adhere to the recommendation for smoking, stop smoking for all cancer sites also was higher for individuals that adhere to the recommendation of being physically active and the score was also higher in individuals cancer survivors that adhere to the recommendation of consuming five servings of fruit and vegetables per day. When we analyse the clusters of the recommendations cancer survivors that adhere to the three recommendations have a higher health related quality score in average compare to cancer survivors that adhere to only two of these recommendations, either smoking and physical activity or smoking and high consumption of fruit and vegetables. These individuals have also higher health related quality score compare to the individual cancer survivors that only adhere to the smoking recommendation and higher score than individuals that did not meet any criteria.

What is the evidence of nutritional interventions in cancer survivors?

I will present the results of the meta-analysis that were conducted by the literature review did in Bristol for the Work Cancer Research report. This group retrieved all the published intervention-trials in cancer, nutritional-based intervention trials and they retrieved 53 trials in different cancer sites. (...) The pool had a ratio of 0.89, it is not significant and what we can see regarding the quality of the studies is that the number of individuals included in the studies is relatively low in addition we had a low number of cases. The interventions were missed, many of the interventions were

dietary advices (...) and some interventions also included liquid dietary supplements and different endpoints were evaluated in different cancer sites. This evidence is in reality inconclusive; it does not rule out the possibility that there is a beneficial effect. In a second part showing the summaries of clinical trials for antioxidants we had some trials with a higher number of individuals and better quality and the relative estimated risk was 0.99 so this indicates that probably antioxidants supplementation in cancer survivors does not modify all cause mortality. Finally the clinical trials with retinol do not provide any overall evidence of any beneficial effect on cancer survival.

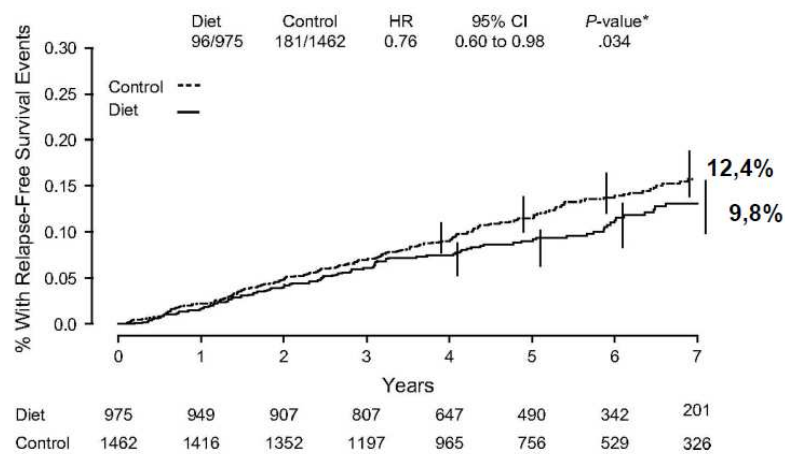
The results of the meta-analysis on cancer mortality is very striking in the low number of clinical trials that could be included in this ratio and overall there is no evidence of dietary interventions and beneficial effect of dietary interventions on cancer mortality. There are some suggestions on the three results on the healthy dietary interventions but nothing for antioxidants and retinol. The main conclusion that can be taken from these analyses is that we need more studies and we need the quality of these studies.

Regarding physical activity, 23 trials were retrieved; half of the trials were in breast cancer survivors. There were several randomized controlled trials in breast cancer and there was consistent evidence of many benefits in particular increased muscular strength, decreased fatigue, fewer treatment side effects in patients with breast cancer. Overall the recommendation is to do 30 min physical activity in addition of the normal physical activity. These results are very consistent but the effects on prognosis are still unknown. With respect to bodyweight, there was enough evidence regarding on obesity and risk of breast cancer recurrence and the conclusion of the panel of experts is that overall recurrence risk increased by 78% among obese women (BMI>30) compare with normal weight (BMI<25). And, the increased risk of recurrence in women with higher body mass index and obese women was observed in different subgroups: in postmenopausal women, in premenopausal, estrogen receptive positive negative and even in women with Tamoxifen use.

I will present the result of two important trials that were published after the meta-analysis for the Work Cancer Research Fund.

The Women's Intervention Nutrition Study (WINS)

Kaplan-Meier estimates of relapse-free survival

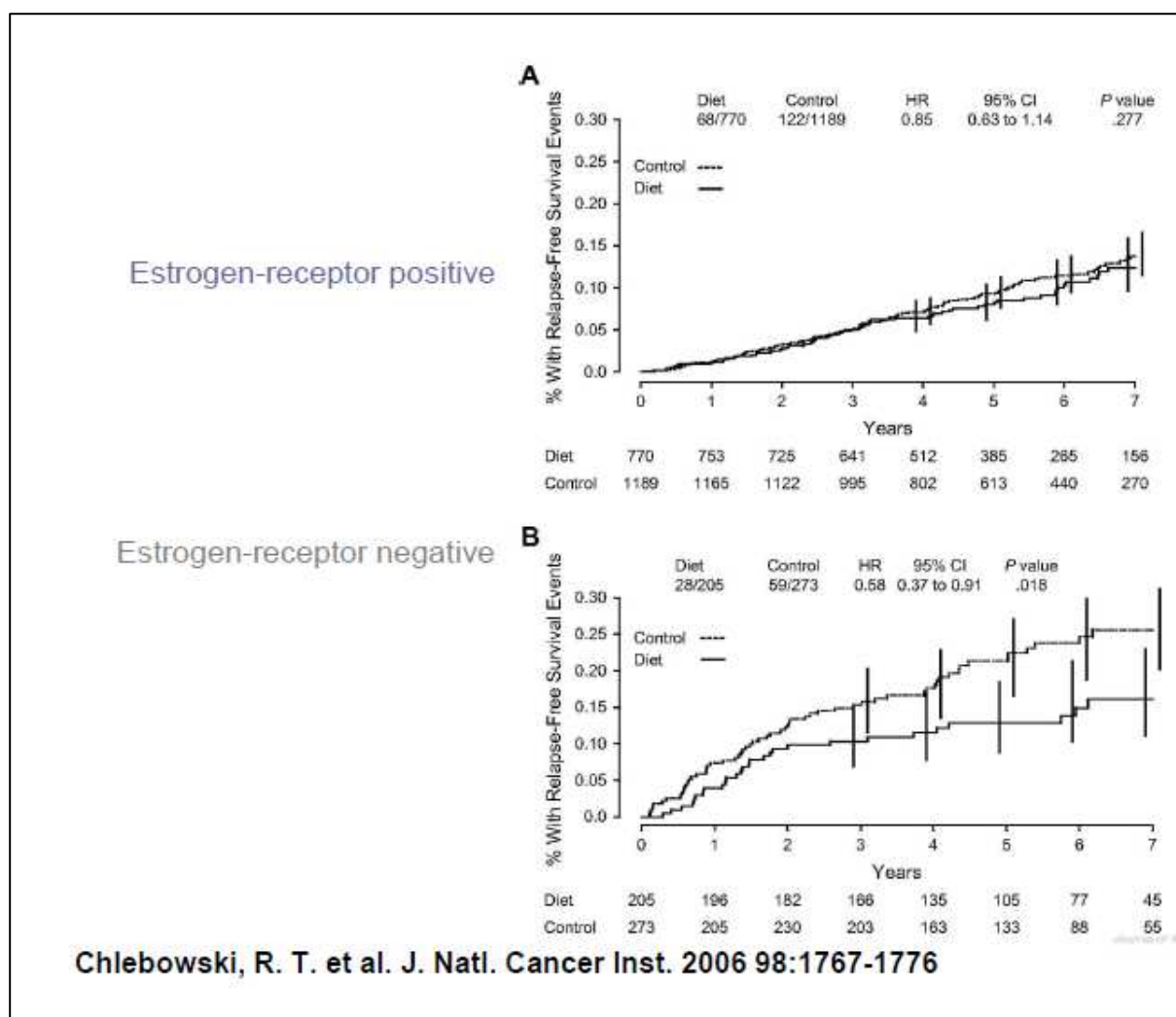


Chlebowski, R. T. et al. *J. Natl. Cancer Inst.* 2006 98:1767-1776

Journal of the National Cancer Institute
JNCI

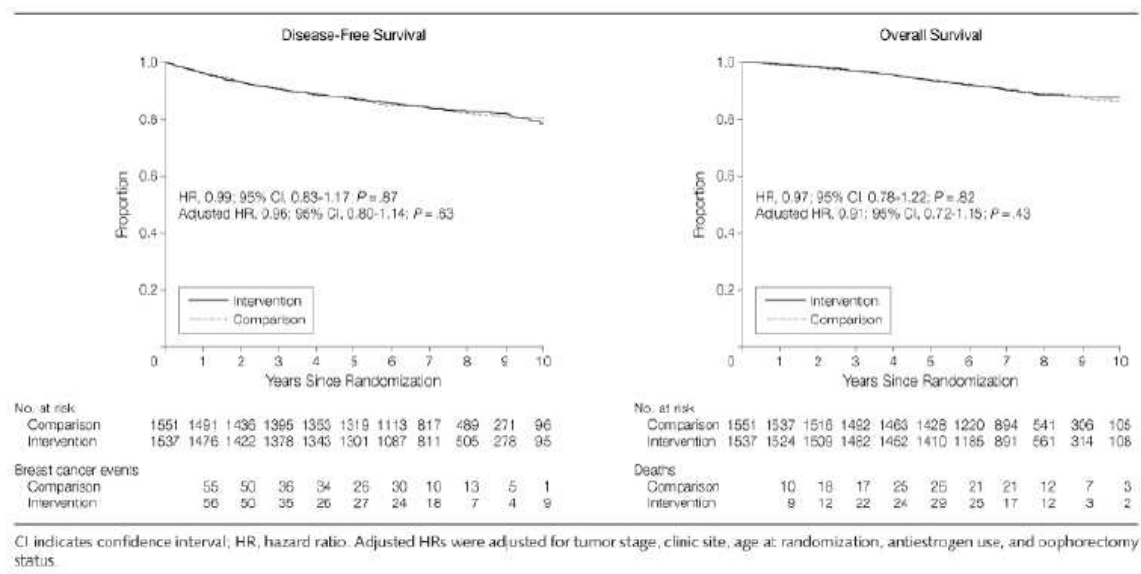
One of the trials is a trial on diet change after survival of breast cancer in The Women's Intervention Nutrition Study (WINS); it is a big trial in more than 2'000 women. The intervention consisted in low fat diet (15% kcal from fats) the diet was calculated on the advice to keep energy intake at a level that maintain weight so the trial was not designed to loose weight but was designed to low intakes of fats from diet. The primary outcome was relapse-free survival. The controlled group received the general control dietary guidelines.

After more than 5 years of follow up in the intervention group there was a 24% reduction in risk of relapse in the intervention group the group with a low fat diet compared to the group with dietary advice. This reduction in risk was observed mainly in women with oestrogen-receptor negative breast cancer.



The second important trial that was recently published was the Women's Healthy Eating and Living (WHEL) Randomized Trial which is a trial on testing the effect of a diet rich in fruit and vegetables in cancer survivors. The intervention group received advices of consuming five vegetables servings, 16 ounces of vegetable juice, 3 serving of fruits, 30 grams of fiber and calories from fat between 15 to 20% while the controlled group received a standard dietary advice (5 servings of fruit and vegetables, 20g of fiber, less than 30% of calories from fat).

Kaplan-Meier Estimates of Disease-Free Survival and All-Cause Mortality by Diet Group



Pierce et al. JAMA. 2007 Jul 18;298(3):289-98

In this trial, no significant difference was observed in cancer all-cause mortality in the two groups. There was also no difference in disease-free survival. So, these two trials pose now the question why there is difference.

How to explain the difference in the two trials?

One trial in which we observe that diet low in fat and rich in fruit and vegetables increase survival (WINS) while in the other trial (WHEL) we do not observe it. There are many possible explanations. One explanation is that in the WINS women intervention group that reduced intake of calories from fat the reduction that they attained was more important than the reduction of fat intake that was observed in the WHEL group. In fact, the average intake of fat in the WINS intervention group was about 20% of energy from fat in average while in the WHEL group it was closer to 26/27%. There was also a difference in weight in the intervention and control groups in the WINS trial although it was not the end of the trial whereas in the WHEL trial the trial of high fruit and vegetables intake there was no difference in weight between the intervention and the control group. So, probably either lower dietary fat or lower weight could account for the survival benefits in the WINS study. But we need more trials to confirm this finding.

I would like to add some notes on vitamin and mineral supplement. I took some information from a review that was recently published of studies that were published between the years 1999 and 2006 about the consumption of vitamin and mineral supplement in cancer survivors. This study reports between 64 and 81% of cancer patients consume multivitamin or mineral. Multivitamin particularly was

reported between 26 and 77% of the cancer survivors. It was new there was a change in supplement use after diagnosis between 14 and 32% of the cancer survivors and 89% started using megavitamins. Only about 3% of the patients received dietary supplement as “not beneficial at all” and what I think is very striking is that between 31% and 68% of the cancer survivors never discuss their choice of multivitamins or mineral use with their physician. The reasons why they do not discuss are not known, the paper could not explore why. This is very important and it is not known if the use of multivitamin and mineral supplement on cancer survivors can have a beneficial or a harmful effect. We all know the results of the two important trials of β -carotene in smoker men that reported an increase in lung cancer. We have some evidence for studies in cancer survivors for example that the use of multivitamin or mineral supplement can be either beneficial or harmful but we need more evidence. Folic acid for example can be involved in progression of cancer in colon or colorectal polyps. Another example of trial, α -tocopherol during radiation in head and neck cancer was associated with higher recurrence of cancer. On the contrary, 35% improved survival was reported in a trial in small-cell lung cancer patients using multivitamin supplements. So the message is that “Vitamin use during treatment is controversial and potentially harmful” this is the message of the American Cancer Society but is at the same time “a daily, multivitamin supplement in amounts equivalent to recommended daily value could be a good choice for anyone...who cannot eat a healthful diet”. And the NCI urges patients to avoid vitamin and mineral supplements while undergoing treatment or to take supplements only under physician’s guidance. The World Cancer Panel notes that do not support the use of high-dose supplements of micro-constituents as a means of improving outcome in people with a diagnosis of cancer. And the panel of WCRF that cancer survivors talk with their physician or a qualified nutrition professional for advice.

Finally these are the recommendations of the World Cancer Research Fund based on the review that was conducted.

These recommendations are summarized as be as lean as possible within the normal range of body weight, physically active as part of every day life, limit the energy-dense food and avoid sugary drinks, eat mostly foods of plant origin, limit intake of red meat and avoid processed meat and limit alcohol drink.

SPECIAL RECOMMENDATION 2	
<p>CANCER SURVIVORS¹</p> <p>Follow the recommendations for cancer prevention²</p>	
<p>RECOMMENDATIONS</p> <p>All cancer survivors³ to receive nutritional care from an appropriately trained professional</p> <p>If able to do so, and unless otherwise advised, aim to follow the recommendations for diet, healthy weight, and physical activity²</p>	
<p><small>¹ Cancer survivors are people who are living with a diagnosis of cancer, including those who have recovered from the disease</small></p> <p><small>² This recommendation does not apply to those who are undergoing active treatment, subject to the qualifications in the text</small></p> <p><small>³ This includes all cancer survivors, before, during, and after active treatment</small></p>	
<p><small>World Cancer Research Fund American Institute for Cancer Research</small></p>	

And as recommendations for the future: to develop large-scale trials with longer follow-up are required, they need to focus research on diet and supplements and impact on outcome for 'survivors', they emphasise the fact that they are confounding variables and heterogeneity of patients make appropriate trial design extremely difficult, should consider Quality of Life in outcomes and will need great care and thought by multidisciplinary team of experts.

As a conclusion we can say it may seem reasonable to assume that following guidelines for cancer prevention would also favorably affect cancer recurrence of survival rates and this is a prudent advice. However, few data are available to directly support this assumption. Persons who have been diagnosed with cancer may be at increased risk for other cancers and for cardiovascular disease, diabetes, and osteoporosis. So the advice in the absence of more evidence is that the guidelines established to prevent those diseases are especially important for cancer survivors

Q&A

A SCHATZKIN: We are all convinced that we do not have enough evidence on beneficial effect on cancer survivals but at this point is not that fruit and vegetables do not do anything for cancer survivors, we just do not have very much evidence.

T NORAT: We do not have very much evidence and the strongest evidence we have is a negative trial that I presented, the WINS. We need to designed better clinical-trials and one possibility is we need to focus on groups of population that maybe would respond better to the therapy. The issue would be how to identify those groups of population that probably would respond to behavior changes, maybe not everybody can respond. But we need more trials anyway, the evidence is limited.

A SCHATZKIN: There were some debates in the field around nutrition, diet and cancer survival as to whether observational studies, epidemiologic studies can play an important role. The concern is for example the prospective cohorts' studies around the world now have recruited enough cases breast cancer, prostate and other cancers that the individual that develop cancer can be followed prospectively. You have got information on diet, physical activity, body size and so on to see what effect or what association those factors have on prognosis and mortality on those who have been diagnose. The concern is that -and I know the Bristol group raised this- those observational studies are quite subjective in confounding, like clinical pathologic characteristic. Arguably the most important factors for survival are spread of disease, treatments and so on. And the data available in the observational studies on those factors may not be good enough. Therefore, some people may argue that the only good data in these areas are going to come from randomized trials. I do not know if you could comment on that.

T NORAT: I think that we should use the information from the cohort studies and in ethic we are thinking how to use this information. It would be very difficult because it was not designed for that so we do not have the mechanism to follow the patients except for second cancers or for mortality but we do not have the way to follow the people for example for cancer recurrence in the same way as we have it for cancer incidence. And we do not have detailed information about cancer and we do not have detailed information about the stages but also about characteristics of cancers like for example breast cancer they can be a big difference between estrogen-receptor positive cancers as we already saw and estrogen-receptor negative cancers and we do not have set up that yet in our studies. But I think that interventions in cohort studies are valuable source of information as it is now for the association with cancer incidence and we have to try to recuperate information and to control.

PUBLIC (American man): (...) there are actually two studies that show a relationship of fat intake and breast cancer risk and that is the Women Health Initiative in the WINS project and both of those start seeing a separation after about 4 and half years. I wonder why in fact you might see this kind of time line before you see a response. Do you think that would also be true about other nutrients that it would take that long to see a response? Then I want to make another general comment about the WHEL project. I think a little more diverse population; some women were a little greasier, prior breast cancer risk and that also may be a very important variable of why you did not see response.

T NORAT: Yes and there were more women with complete surgery. There were differences.

PUBLIC (American man): There is at least some data coming out now some populations even in that project that looks like that some people may have been more responsive than others. We may need to start thinking about some population.

T NORAT: I agree with that.

PUBLIC (French man): How do you explain that cancer survivors do not follow the dietary recommendations about fruit and vegetables in one side and at the other side mineral and supplementations? Why do they believe that supplementation is better for them than fruit and vegetables?

T NORAT: I do not have explanations why they do not follow the dietary advice and why they think that consuming more vitamin supplements will be beneficial for health. I do not have any explanation, it is not known. I think this an important element topic of research.

Biomarkers of F&V intake and cancer risk

Mazda JENAB

IARC, Lyon, France

Higher consumption of fruits and vegetables has been suggested to be associated with a decreased risk of many cancers. This hypothesis was supported for several cancer sites in the WCRF Expert Review of 1997, but since then the accumulating evidence suggests a decrease in confidence in this hypothesis, as highlighted by the conclusions of the IARC Review of 2003 and the most recent WCRF Expert Review of 2007. These overall conclusions may well be correct, but there may also be some other potential explanations.

One of those has to do with how dietary intakes are assessed. All methods of dietary assessment are associated with some degree of inherent measurement error to do with for example, the type and amount of foods consumed, portion sizes, recipe ingredients, food combinations, cooking methods, reporting biases and even nutrient estimation. If we consider all of these uncertainties and add them up, the end result is a considerable amount of systematic and random measurement error that really can not be ignored in any situation.

A solution to the problem of dietary measurement error is to acquire an “independent” observation of dietary intake or a measure of “true” intake, i.e. dietary biomarkers. The underlying assumption of dietary biomarkers is that the biomarkers will lead to a better classification or ranking of subjects for the intake of a particular food or food component than would a dietary measure. Many nutrition epidemiologists have dreamt about an ideal biomarker, but the reality is that such an entity does not exist. But, if it were to exist it would be specific, sensitive, valid, reproducible and applicable to many populations with different dietary patterns. Many of the biomarkers that are currently used in nutritional epidemiology fit some of these criteria, but not all of them.

Fruits and vegetables are hypothesized to have an effect on cancer risk in large part because of their phytochemical components, many of which are often utilized as dietary biomarkers. We know that many of these phytochemicals have properties that may affect cancer risk by way of various biochemical pathways and mechanisms. We also know that the phytochemical levels might be different in different tissues or organs interest.

But, the question at hand is what may affect the levels of these biomarkers in the blood? The blood level might be affected by a variety of different factors, such as intake levels, dietary patterns, dietary habits, changes with cooking, bioavailability from the GI tract, interaction with other dietary components (for example, non-heme

iron is better absorbed in the presence of vitamin C) or the presence of variety of lifestyle factors such as smoking, physical activity or alcohol consumption. Something that we do not know very much about is genetic variability, and how it may affect the metabolism, rate of absorption and excretion of these biomarkers, or how these factors may differ between people and populations. All of these factors can affect the exposure, concentration and availability of the biomarkers of interest.

Something else that we do not know very much about is how these biomarkers and nutrients may act synergistically, additively or even antagonistically, and how such variation may impact the assessment of cancer risk.

Another aspect that may affect the measurement and utility of biomarkers are analytical factors. In other words, issues to do with the biological sampling - the type of biological sample, how it was obtained, how it was treated, how it was stored, how many freeze-thaw cycles it went through, and so on. The stability of the biomarker during processing and decay over time in storage and the laboratory methodology used to assess that biomarker are also part of the issue, as are, of course, costs.

In general, the main considerations for many dietary biomarkers are: Does the biomarker approach really substitute for an assessment of whole fruit and vegetable intake? And does a dietary assessment provide sufficient information to preclude the use of a biomarker or is a biomarker approach preferable? In most cases, the answer is that they are both necessary and provide very useful information.

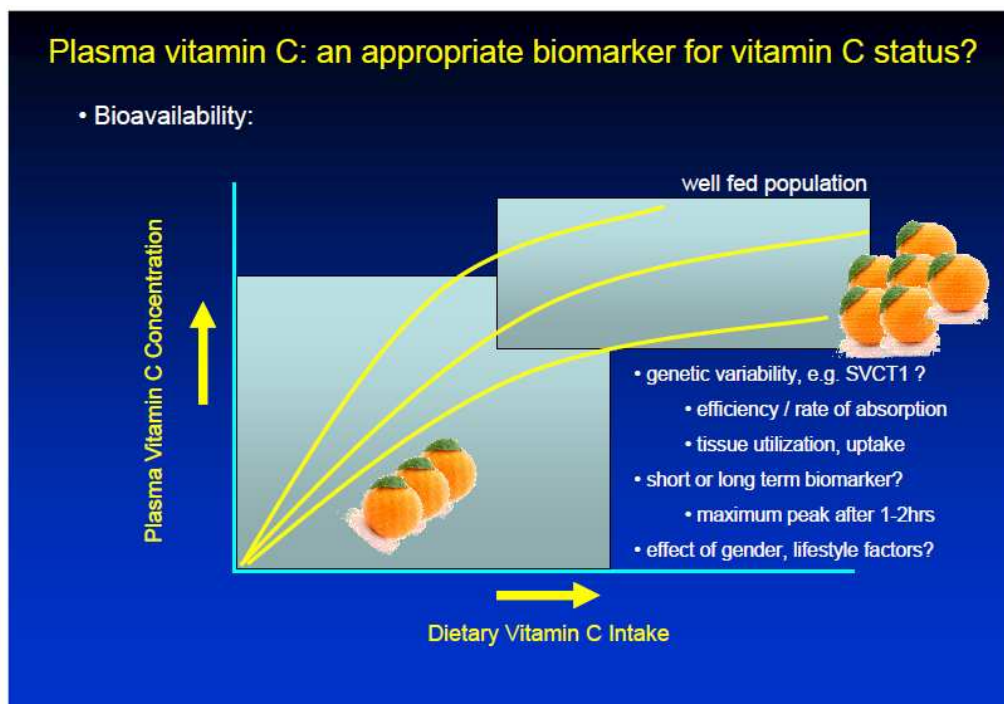
To illustrate these points I am going to use some examples of common biomarkers: vitamin C, carotenoids and tocopherols.

Vitamin C is an important water soluble nutrient, with a variety of different functions, the most important of which appear to be its antioxidant abilities, and its ability to scavenge nitrite and to inhibit in vivo nitrosation and n-nitroso compound formation.

But, the question is: is plasma vitamin C an appropriate biomarker of the level of fruit and vegetable intake or the level of vitamin C intake? Many studies have been performed to assess this question. The overall conclusion appears to be that there is only a moderate correlation between plasma vitamin C levels and dietary intakes. In general, plasma vitamin C has correlations of about 0.3 with total fruit intake, a lower correlation with total vegetable intake and a slightly better correlation with assessments and estimations of dietary vitamin C intake. But in general, these correlations are very moderate.

That is in part explained when we look at the dietary sources of vitamin C. We observe there is a wide range of sources ranging from about 3mg/100g up to 0/100g. If a dietary assessment method does not assess the full range of fruits and vegetables that provide vitamin C in a particular population then that can lead to considerable errors if vitamin C is used as a biomarker of fruits and vegetables intake in that population.

Another aspect to consider is bioavailability. In a perfect world, bioavailability of intake would equate exactly to plasma vitamin C concentration. But in reality the curve has a linear range and a non linear range or plateau at higher intakes.



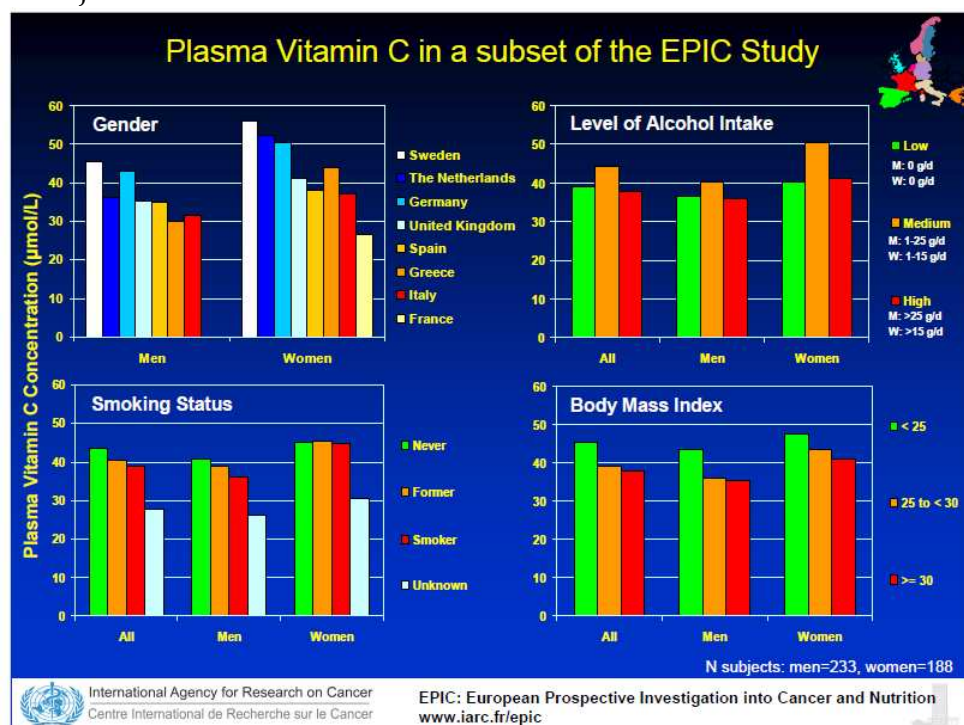
If you look at the linear range which is often seen at lower intake levels of vitamin C (approximately up to 90 to 100 mg/day intake or about three oranges per day): the vitamin c transporter protein is not saturated, the absorption is at a maximum and the renal excretion is at a minimum. However if we consider a population such as a well fed vegetarian population which has a high intake of a variety of fruits and sources of vitamin C we see that they may likely fall into the plateau range. So for a population in the linear range vitamin C might well serve as a good biomarker of fruit and vegetable intake. But for subjects who are in this plateau range, vitamin C may not correlate well with the dietary intake because no matter how much they consume, they will still be at a plateau. Although, even at this level, vitamin C may still be informative for assessing cancer risk and the ranking of subjects.

Another aspect that I mentioned before is genetic variability, for example, as applicable here, in the vitamin C transporter protein. This may affect the efficiency,

rate of absorption, tissue utilization, and uptake of vitamin C. This results in different curves for different subjects and different populations. How do we compare them if we do not know anything about the genetic variability affecting blood vitamin C levels?

Another aspect is: is the biomarker a short or long term biomarker of intake? Vitamin C is maximally absorbed after 1 to 2 hours after ingestion. So it is a short to moderate term biomarker of dietary fruits and vegetables intake. This may not be a problem for a population that has a constant intake of fruit and vegetables but it may be a problem for a population that has inconsistent levels of intake.

Another aspect is: how do lifestyle factors affect the concentration of the biomarkers in the blood? This is something I would like to illustrate by presenting some unpublished data from the EPIC study where we measured plasma vitamin C in a sub-set of subjects.

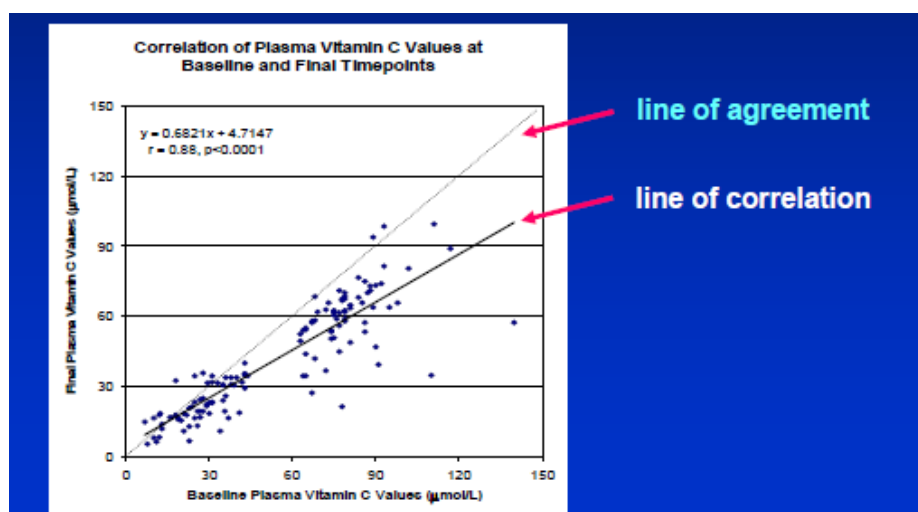


Here we observe variability between the 10 EPIC countries in terms of vitamin C levels; also by gender. There is also variability by lifestyle factors such as the level of alcohol intake, smoking status and body mass index. The point here is simply to illustrate that these variables may affect the correlation of plasma vitamin C with dietary measures of fruits and vegetables. This may also have an impact on the assessment of vitamin C with cancer risks.

I mentioned before that analytical factors could affect vitamin C. Vitamin C is in fact one of the most labile nutrients and issues of how the biological sample was processed, how it was collected, how it was stored, and what analytical method was

used could all affect the measured plasma vitamin C level. Another aspect that is not well studied is the decay of vitamin C over time in biological samples that are in storage. We studied this within the EPIC study.

This graph shows the baseline vitamin C level as compared to the final vitamin C level for the same subject after up to 11 years in frozen storage at minus 196° C. If there was no decay we would expect that the before and after measurements line up along the line of agreement. But in fact the line of correlation is lower indicating that there is some decay after frozen storage.



The degree of decay is illustrated by this table:

EPIC	Average loss of plasma vitamin C from baseline to final time points (%)	
	Men	Women
Plasma Vitamin C at Baseline		
Lowest Quintile	8.2 (p=0.2406)	17.6 (p=0.0003)
Highest Quintile	24.6 (p<0.0001)	24.2 (p<0.0001)

We see that the rate of decay is dependent on the concentration of vitamin C at baseline. So, lower concentrations of vitamin C at baseline have a lower decay and higher concentrations of vitamin C at baseline have a higher percentage of decay. This could have an impact not only on the correlation of the vitamin C with the dietary variable but could also impact the ranking of subjects as we assess cancer risks.

Another group of compounds that I would like to talk about are the carotenoids and tocopherols. These are also used as biomarkers of fruits and vegetables intake and like vitamin C it is thought that they may act as antioxidants and limit free radical mediated damage. I would like to use these compounds to illustrate another point: is it sufficient to measure one biomarker from a class of compounds? Do all compounds in a same class have the same effect? Are there synergistic, additive or antagonistic effects - something that we do not know much about? All of these could affect the

concentration or availability in the tissues or organs of interest. Here again, I would like to present some data from the EPIC EURGAST Study.

The EURGAST study is a component of EPIC that focuses on gastric cancer. EPIC is a large prospective cohort of 520,000 subjects from 23 centres in 10 European countries where we have detailed dietary and lifestyle data as well as biological samples collected. Using the biological samples, we conducted a nested case-control study of 238 incident gastric cancer cases matched to 626 controls; we used validated, country-specific dietary questionnaires and measured vitamin C, carotenoids and tocopherols in their plasma using the most recent methods.

This graph presents the odds ratio for gastric cancer risk for a battery of carotenoids, α -tocopherol and vitamin c for the bottom versus the top quartile of plasma concentration.

Plasma Analyte	Bottom vs. Top Quartile (ug / dL)	OR (95CI)
α -Carotene	< 3.2 vs. \geq 9.0	1.19 (0.71-1.99)
β -Carotene	< 12.0 vs. \geq 26.5	1.13 (0.69-1.86)
Canthaxanthin	< 0.4 vs. \geq 1.6	0.80 (0.44-1.45)
Lutein	< 14.6 vs. \geq 28.9	0.73 (0.43-1.37)
Lycopene	< 17.8 vs. \geq 44.7	0.63 (0.36-1.09)
β -Cryptoxanthin	< 5.8 vs. \geq 18.7	0.53 (0.30-0.94)
Zeaxanthin	< 3.2 vs. \geq 6.7	0.39 (0.22-0.70)
Total Carotenoids	< 70.5 vs. \geq 135.9	0.69 (0.39-1.21)
α -Tocopherol	< 1022.0 vs. \geq 1393.7	0.59 (0.37-0.94)
Vitamin C (μ mol / L)	< 29.0 vs. \geq 51.0	0.55 (0.31-0.97)

Carotenoids/Tocophérols: Jenab et al, *BJC* 95:406, 2006 ; **Vitamine C:** Jenab et al, *Carcinogénèses*, 27:2250, 2006

As you can see, for α -carotene and β -carotene there is a non statistically significant positive cancer risk association, whereas for the other carotenoids we observe a negative association which is strongest for zeaxanthin. The point illustrated is that if we had just looked at β -carotene, we may have thought that they have a possible positive risk association, whereas when we consider a few more carotenoids we see that the picture is a bit different. Here, we only considered 7 common carotenoids but in reality there are about over 600 different carotenoids in fruits and vegetables and over 40 that are possibly found in human blood. We have not considered any of the other carotenoids and we have no idea what the overall total carotenoid effect may be. The variable of total carotenoids shown here is just a very basic sum of the concentrations of the individual carotenoids we measured. We have no idea how these individual carotenoids interact with each other and whether the different levels of carotenoids have the same effect in terms of antioxidant activity, for example.

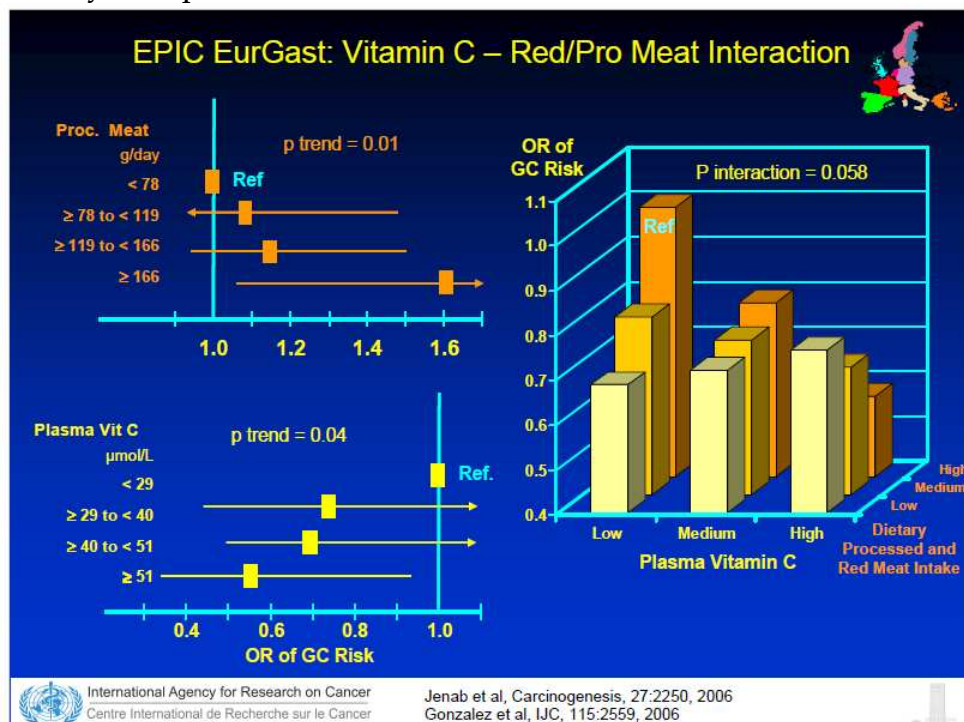
Here, α -tocopherol and vitamin C showed a negative association with gastric cancer in our data set. It is important to point out that for all of these biomarkers, no gastric risk associations were observed for the corresponding dietary variables. So, had we just considered the dietary questionnaire variables, we would have concluded a null disease risk association.

I mentioned earlier that vitamin C is important because it acts to inhibit endogenous N-nitroso compound formation in the gastrointestinal tract. N-nitroso compounds are formed from intake of dietary nitrate which comes from a variety of different dietary sources particularly from processed meats. We have to ask, would a high intake of vitamin C reduce the positive gastric cancer risk association that we observe with higher intake of processed meats? Within the EPIC EURGAST data set using dietary questionnaires we observed that higher intake of processed meat is associated with an increase in gastric cancer risk. We also observed, as I described earlier, that higher plasma concentration of vitamin C is associated with a decrease in gastric cancer risk. When we consider the two variables together we observe a statistically significant interaction which seems to suggest that the negative effect of vitamin C on gastric cancer risk is strongest in the presence of higher intake of processed meats. I put this up to illustrate the point that the population that we are looking at for a particular biomarker may be very important. In this case, the effect is strongest in high meat eaters. This example also illustrates how biomarker and questionnaire data can be combined to address relevant hypotheses.

In summary, both biomarkers and dietary assessment methods provide very useful information. Biomarkers and dietary assessment methods are both associated with various errors and limitations. We need to: improve dietary assessment methodology, improve and update how we compute nutrients, improve our understanding of the metabolism of existing biomarkers, identify new biomarkers of fruit and vegetable intake and most important of all, improve our knowledge of nutrient metabolism and nutrigenomics in particular. It is fair to conclude that only enhanced information from both dietary assessment methods and biomarkers can improve our knowledge of the association between fruit and vegetable intake and cancer risk.

Q&A

PUBLIC: Can you explain a little bit the slides about meat interaction?



M JENAB: If look at the interaction graph, our reference category is the category of low vitamin C and higher meat consumption and we see that the strongest effect as we move from low to high plasma vitamin C concentration is actually in those who have a higher dietary meat intake. This suggests that the gastric cancer protective effect of vitamin C is strongest in this population and it suggests that vitamin C may be acting, as the hypothesis suggests, by inhibiting N-nitroso compound formation from dietary nitrate which is higher in this population that eat a higher amount of processed meat than those who eat a lower amount of processed meat.

A SHATZKIN: Are you concerned about how well you measure meat while you measuring all this? Perhaps you have more than one dietary factor eaten that is measure with error?

M JENAB: Sure, that is a concern as well. However in the EPIC study we have prospectively built a mechanism to calibrate the dietary questionnaire measures and we have that mechanism from a subset taken much standardised 24 hour recall which we use as a gold standard to calibrate the dietary questionnaires. Now the data that I provided here is not calibrated, the data just come from the dietary questionnaires. However when we look at the calibrated data the association is exactly the same and so this gives a little bit of confidence in the meat data that we are observing.

A SHATZKIN: You argued for better biological markers for fruit and vegetables intake, are you optimistic that we will come up with such better biological markers? And do you see work going on to get them? Some of the other speaker might answer at some other degree.

M JENAB: I am not aware of much work going on, they may well be but I am not aware of identifying new biomarkers. But I am very optimistic that we can learn how to better interpret and better utilise these existing biomarkers.

PUBLIC: I guess in this context we do have biomarkers now that are relevant to fruit and vegetables consumption, I am wondering if there has been much done with regard to trying to use them together in compilation. You talked about the carotenoids and that capacity of whether or not expanding beyond to give a broader picture of exposure of that being done and how it has been done?

M JENAB: I am not aware of that being done but I think it is what we need to do. A major limiting factor may be the cost associated with analysing these compounds and also the amount of blood that is required to analyse these compounds. In a cohort study blood is very precious so you have to use very minute amount to work with. Perhaps for a lot of phytochemicals that I put up we need to develop better methodology to analyse them in much smaller amounts of blood.

A SHATZKIN: Do you see any potential in combining not only the biomarkers as you just discussed but combining the biomarker data with the self reported data whether it is food frequency questionnaire or even some of the new approaches to get multiple 24h recalls whether it is combined biological markers of fruit and vegetables intake with your self-reported data to even get perhaps a more accurate approach of true intake?

M JENAB: That is what I am actually trying to illustrate with this interaction graph where we look at data from dietary questionnaires and data from biomarkers together and my conclusion, the final sentence, stated exactly that we need enhanced information from all the various sources enable to get a better understanding on what is going on.

Vegetables and Genetics: Feeding Studies in Cancer Prevention

Johanna LAMPE

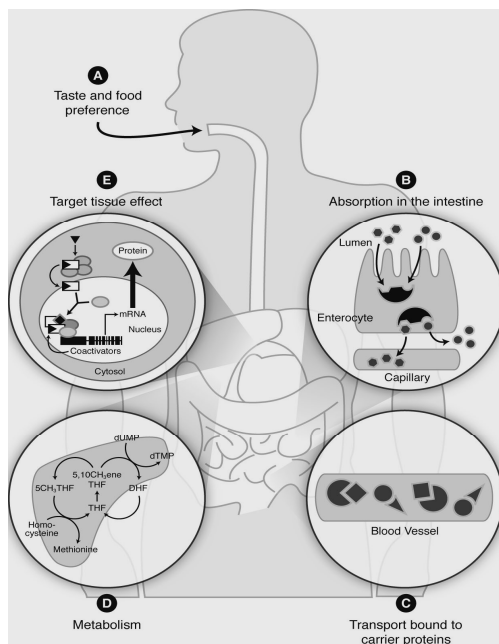
Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, USA

(...) I would like to pick up where Mazda Jenab left off with regards to some of the issue related to variation in response to fruit and vegetables, particularly focusing on some of the work that we have done in the context of exposure to different types of vegetables. One of the buzz words of nutrition these days is "nutrigenomics," which includes the concept that genetic variation can influence response to diet. We tend to think of this primarily in the context of the human genome both from the stand point of variation with regards to genetic variation. However, and I think Dr Milner will talk a little bit about this, more and more, other aspects of genomics may also come in to play. The variation in our epigenome is where genes are being expressed depending on whether or not promoter regions are methylated. Another genome that only recently has begun to receive more attention is the genome of our bacteria. In relation to diet, the gut bacteria have an important role and contribute to differences in response to diet. In that context all of these factors can contribute to cancer risk.

Because of the time limitation, I will focus primarily on host genome with regards to

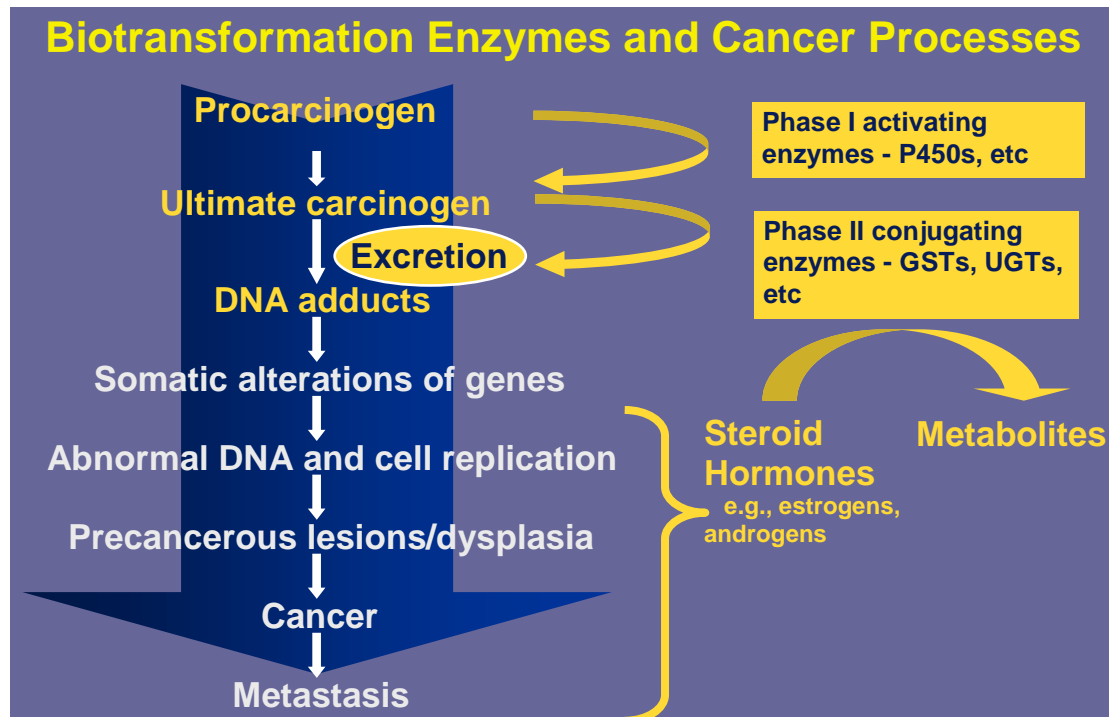
its impact on affecting diet, but you can also think about this in a much broader context. Genetic variation may contribute to individual response coming to the point even from the stand point of the food choices that we make. There are data to show that our food choices, whether or not it be fruit and vegetables, or whether it be how adventurous we are in our eating, is under some genetic control. There are some elegant twin studies that show differences between monozygotic and dizygotic twins, suggesting a genetic component to food preferences. Similarly food tolerance -- a prime example being lactose tolerance in adults -- absorption, transport, metabolism and the effect at the level of the target tissue are influenced by

genetic variation and differences at all these points may play a role in our overall response to diet.



In the case of cancer, one of the points whether there is probably the most data with regard to genetic variation is in the area of biotransformation enzymes. These are groups of enzymes that are thought about typically in their role in handling potential carcinogens.

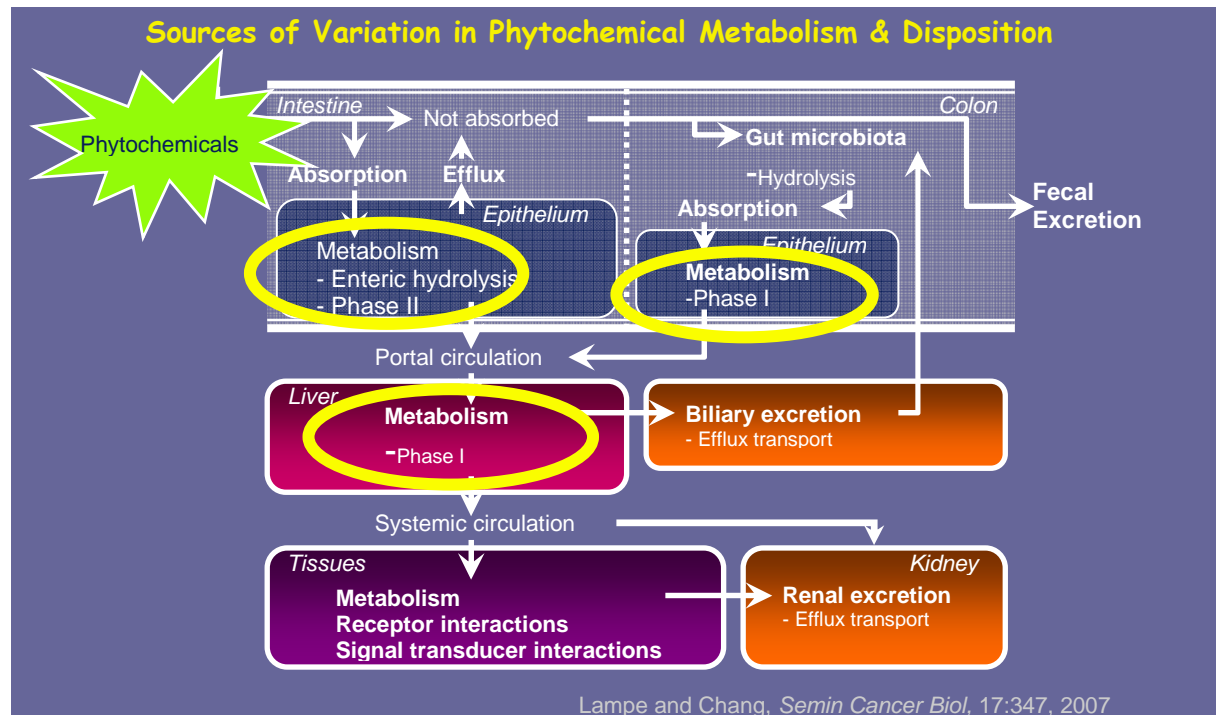
Most of the possible carcinogens exist in the environment not as carcinogens in and of themselves. If they are metabolised either by P450s in the phase of activation and not conjugated and excreted, they can contribute to the initial processes of carcinogenesis. At the same time, these enzymes are also involved in metabolism of



endogenous compounds. For example, the steroid hormones are conjugated and excreted in urine and bile and because of their proliferative effects can affect some of the downstream aspects of the cancer process. Therefore, these enzyme systems are receiving quite a bit of attention with regards to the cancer story. From the stand point of fruits and vegetables, we know from a wide body of literature that phytochemicals can modulate these enzymes. At the same time, these compounds in fruit and vegetables are also metabolised by these enzymes, so it is quite a complex story, especially when we add the layers of genetic variation on top of it.

If you think about all the various points at which we can find variation in phytochemical metabolism, there are absorption and handling by gut microbiota and metabolism by either phase I or phase II enzymes, which can occur at the level of the intestinal epithelium, in which case many of these compounds will be pushed right back to the lumen of the intestine and be excreted and will not even be absorbed beyond that point. Otherwise, if the compounds are absorbed, they can be metabolised in the liver. There are also other points which genetic variation can

contribute to differences in exposure, including excretion systems and interaction at the level of the tissue.



One of the approaches to try to get at some of this genetic variation in metabolism is to use controlled feeding-trials. This helps to reduce some of the variation from environmental factors that are a concern in observational studies, and allows for greater focus on the genetic pieces that may play a role. The utility of this type of study is that you can:

- control intervention and the background diet;
- test dose-response, which helps to establish a biomarker level in relation to a particular fruit and vegetable exposure;
- conduct genetic studies, selecting particular genetic variants in such a way as to have sufficient statistical power to really ask the question of whether or not people with a certain variation respond or do not respond. Typically, with this type of study we often rely on whoever we have in the study and in post-hoc analyses attempt to evaluate whether or not there is a genetic interaction with regards to particular genotypes. Unfortunately, with many of the polymorphisms, the prevalence is relatively low, maybe 10 or 20% and as a result you end up with only a handful of individuals who are less common variant. A priori participant selection on the basis of genotypes gives you a chance to expand the sample of those rarer variants and gives better power;
- monitor intermediate markers of susceptibility

Unfortunately, because of the complexity of providing all the food to study participants and the costs of conducting such studies certainly these are not the types of studies that can be used to evaluate cancer as an outcome. That requires a behavior-based intervention trial. But, we can use feeding studies to set the stage for

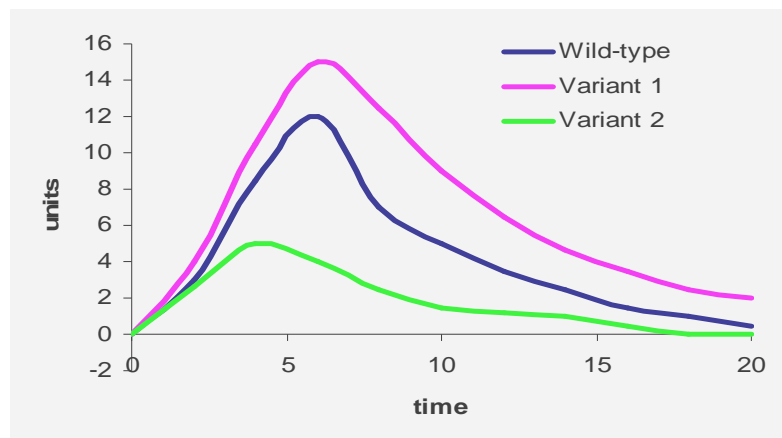
establishing some of the biomarker relationships and they can help us to target some of our prospective intervention strategies in the future.

There are several studies of the interaction between genetic variation and cancer-causative agents. For example the NAT2 polymorphism affects response to a diet of well-cooked red meat. Individuals who rapidly acetylate the compounds in cooked meat are more likely to have DNA damage in the colorectal mucosa compared to if they were not consuming the red meat and compared to the individuals who have a slow NAT2. So there is difference in response in the intermediate marker of risk. Similarly, in a study looking at the mutagenicity of urine from individuals fed red meat fried at high temperatures, individuals who had the UGT1A1*28 polymorphism tended to have more mutagenic urine than the individuals who did not have this genetic variant. UGT1A1 is in the UDP-glucuronosyltransferase family and the UGT1A1*28 polymorphism results in 50 to 60% the amount of enzymes than those of the individuals who have the wild type allele. These data suggest that the UGT1A1*28 variant results in poorer conjugation of compounds such as polycyclic aromatic hydrocarbons and may contribute to higher mutagenicity.

From a genetic stand point we have to keep in mind the totality of the diet in that we are not only dealing with exposure to a mixture of carcinogens and mutagens, but also protective agents. In many cases these compounds are all handled by the same groups of enzymes. So, in the context of, for example, high meat intake one genotype may be highly protective but at the same time those individuals may be handling the phytochemicals in the fruit and vegetables very differently, that is they may be clearing them more rapidly and not gaining the same possible protection from the phytochemical as somebody who has a different genotype.

If you think about this in the context of doing a pharmacokinetic study of a particular phytochemical, you might imagine that if you have somebody who has the wild type genotype, that is the enzyme is functioning normally with regards to clearance of a particular phytochemical and you might see a pattern that is the dark blue line of the graph.

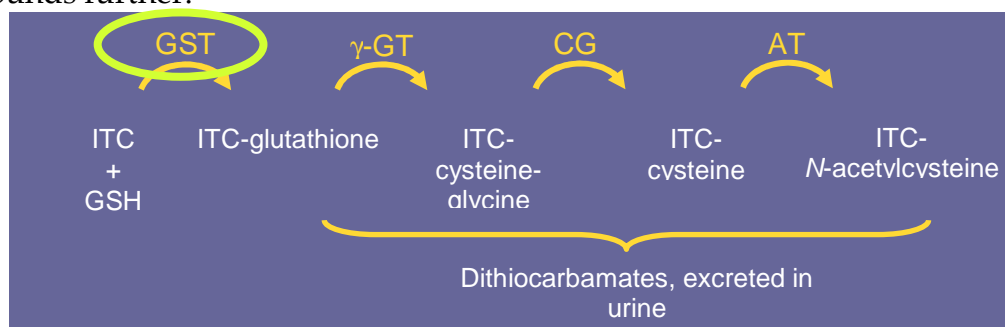
Theoretical Effect of Polymorphic Conjugating Enzymes on Phytochemical Pharmacokinetics



- Polymorphic enzymes with lower activity prolong exposure (Variant 1)
- Polymorphic enzymes with higher activity shorten exposure (Variant 2)

And, if you have a polymorphism which results in lower activity this may prolong exposure to the compound. In contrast, if you have a variant that produces a more active enzyme you may see more rapid clearance as in the case of the bright green. So, in the context of clearance of phytochemicals these polymorphic enzymes may give you very different results. Unfortunately there are few studies that have been done to evaluate this. Nonetheless, we know that in the context of drug metabolism that this occurs for a number of drugs and there is no reason to believe that this would not impact exposure to phytochemicals; however, we do not have much data to support this.

One area of phytochemical metabolism that has received a bit of attention is metabolism of the isothiocyanates from cruciferous vegetables. These compounds are present in crucifers as glucosinolates. They are hydrolyzed to isothiocyanates, which are the bioactive compounds, and then the body rapidly degrades them. The first step of the process is conjugation of the isothiocyanates by glutathione S-transferases and a series of subsequent enzymatic steps that degrade the compounds further.

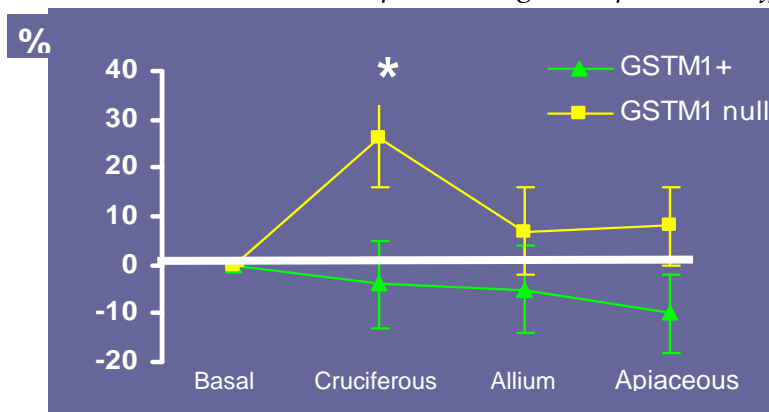


The glutathione S-transferases (GST) come in many forms, the major ones being alpha, mu, pi and theta, of which mu, pi and theta play some roles in regard to metabolism to the GSTs. Also mu and theta in humans are highly polymorphic; there are very common genetic variants that result in complete lack of formation of the

enzymes, such that you do not produce any GSTM1 or if you have another polymorphism you do not produce any GSTT1. The prevalence of the GSTM1-null genotype can be as high as 60% of the population depending on what population. This suggests that, for the most part, we do just find without these enzymes, but in the context of a certain exposure this lack of GST might be a problem.

Seow et al. presented the following hypothesis:

“Based on our understanding of the biological interaction of GST and isothiocyanates, we would expect that individuals who are null for GST and who therefore less readily conjugate and excrete these compounds, would have greater amounts of isothiocyanates at the tissue level, and hence would experience a greater protective effect.”

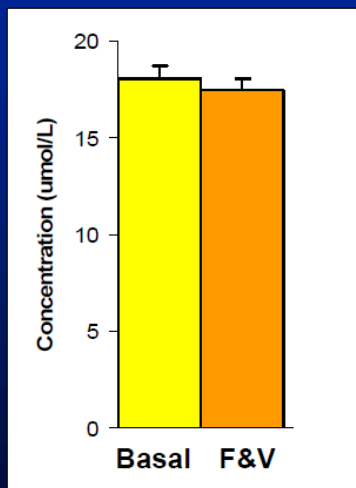


In the context of the available observational data on the interaction of cruciferous vegetable exposure and the GST polymorphisms, the data are very mixed. Depending on which population you look, at some find that individuals who are GSTM1-null or T1-null are protected in the context of

exposure to cruciferous vegetables. Typically, in western populations, we see the inverse, with on GSTM1+ and GSTT1+ being protective. We conducted a controlled feeding trial of different botanical groups of vegetables in individuals who were GSTM1+ and GSTM1-null and we saw that among the individuals who were M1-null there was an increase in serum GST- α , suggesting a potential for a greater effect of cruciferous vegetables in the GSTM1-null individuals.

At the same time, in the last couple of years, we now have pharmacokinetic studies from Gasper and colleagues that look at sulforaphane pharmacokinetics in individuals who were GSTM1-positive and GSTM1-null. They found the opposite of what we have been hypothesizing; that is, the individuals who are M1-null actually excrete larger amounts of the metabolized sulforaphane, as well as sulforaphane itself, whereas those individuals who are M1-positive excrete less. More recently, a larger study by Steck and colleagues looked at the effect GSTM1 genotype, as well as GSTT1, GSTP1 and GSTA1 genotypes, on isothiocyanate excretion. Essentially they found no overall effect of the genotypes except that there tended to be a higher proportion of individuals who were excreting high amount of isothiocyanate if they were M1-null. These results are in keeping with the data of Gasper et al., but do not support the hypothesis that lower excretion and higher circulating levels of the isothiocyanates would be found in the M1-null. These results suggest that we still have a long way to go to really understand the relationships between these enzyme systems in relation to genetic variation.

Another area of interest with regards to the Phase II conjugating enzymes are the UDP-glucuronosyltransferases, which are major glucuronidators of steroid hormones and therefore in the context of hormone-dependent cancers may play a role as far as determining life-time exposure to steroid hormones. We have examined the effects of diet on UGT1A1 which is important in glucuronidating endogenous estrogens, as well as polycyclic aromatic hydrocarbons and heterocyclic amines in well-cooked meat. One of our big challenges in these types of studies is actually being able to measure enzyme activities in humans, where invasive strategies are not appropriate. It would be nice to have a liver biopsy, but that is not an option. This requires that we have surrogate biomarkers that we can use to evaluate the activity of these enzymes. In the context of UGT1A1, serum bilirubin is conjugated primarily by UGT1A1 so it serves as a nice marker.



LS means \pm S.E.

- Recruited 72 healthy men and women (20-40 yrs) based on *UGT1A1**28
- Randomized cross-over study of two 14-day controlled feeding periods
 - Basal, low plant-food diet
 - High F&V diet (cruciferous, soy, and citrus)
- Evaluated measures of UGT activity

Chang et al., *J. Nutr* 2007, 137:890-7

In this study we examined the effect of a diet low in plant foods -- essentially devoid of all fruits and vegetables, spices, herbs -- compared to the same diet supplemented with a mixture of cruciferous vegetables (e.g. broccoli cauliflower and cabbage), as well as soy foods and citrus fruits (e.g. grapefruit, oranges etc). Looking at UGT activity, overall there was no difference in serum bilirubin as the result of the fruit and vegetable intervention compared to the basal study. However, when you break this down by UGT1A1 genotypes, among individuals who are wild type intact for the enzyme (i.e. have the optimal enzyme activity), in both men and women we see no response to the fruit and vegetable intervention and in individuals who carry one of the 28 alleles similarly no difference. However when you look individuals who are homozygous variant and have substantial reduction in the UGT activity, you see that the addition of fruit and vegetables results in significantly higher clearance of serum bilirubin, but only in the women. Interestingly, here we focus on genetic differences

but we also find that there are often sex differences in response to diet and I think we have to keep this in mind in designing studies and interpreting our data.

So there are many questions that we need to consider with regard to the interaction between genetic variation and fruit and vegetable intake. We need to consider not only the impact of human genetics on response to fruit and vegetables, but also the modifying effects of other environmental factors that contribute to cancer risk. Which of the polymorphisms are important in relation cancer? We are now to the point technically where we can interrogate the whole genome and we can go after every single nucleotide polymorphism in every person, and really get down to the minutia. However in the context of cancer risk in populations which are the ones that we need to focus on? Also, on a more global level, the relationship between diet and cancer risk differs in various part of the world. Given the differences in prevalence of polymorphisms between populations and the differences in diet, we also may be able to strengthen our understanding by integrating data from various populations around the world.

In summary, studies have suggested that genetic polymorphisms in enzymes involved in phytochemical metabolism and disposition may contribute to some of the interindividual variation with regards to risk for cancer. We need to continue to identify the various sources of genetic variation that is affecting response to fruit and vegetables in order to understand better their impact on cancer risk. Also, many of the phytochemicals are metabolized by gut bacteria and the effects of genetic variation in microbial populations also warrant attention. I would submit that we certainly have not used controlled feeding studies to the fullest extent to try to address these issues and would encourage those of you who do controlled feeding trials to build in opportunities to evaluate some of the genetic factors that may contribute to differences in phytochemical metabolism, as well as differences in response to the interventions.

(...)

Q&A

A SHATZKIN: You mentioned all the work is going on now with the all genome association studies going on with multiple cancers. Are they going to help much with the kind of things that you were showing us with the feeding studies and the bio transformation enzymes?

J LAMPE: I do not know. I think one the issues is that they may help as far as informing what genotypes may want to look at in the context of the feeding studies. I am not sure that doing *genome mite scans* in the context of a feeding study would be that useful unless you have got a very large study because you are going to end up

with so much data and you are going to be slicing and dicing into such small numbers than to make comparisons that hold up statistically I am not sure that we can go there. But I think and I hoping that some of the works that comes out of the other studies will help to guide where we may want to focus on and try to get out some of the specifics.

A SHATZKIN: With more work going on to improve the way we assess diet in fruit and vegetables and with more work going on in biological markers what Dr Jenab said, is there a case to be made that these big prospective cohort studies need to be genotyping everybody as well to actually zero in on the correct relationship of fruit and vegetables and cancer?

J LAMPE: I think there is a place particularly in the context be a fact with regards with both handling of carcinogens as well of handling of chemo protective agents for the extend that we need to be genotyping for every single one of them. I think that we can do that but we will probably find that there are going to be certain of these genes where it is very important in the context of some of the UGTs relation to the exposure to some of the phytochemicals that are heavily glucuronidated that they may play a major role. Similarly sulfation of many of the flavanoids may be affected by polymorphism in these. I think that we do not know the extend of how broadly we want to be genotyping but at the same time the combination of the controlled feeding trials to try to get what is the degree of difference such as what is the genotype that is associated with the genotype in a controlled environment and then you want intake that to the observational work.

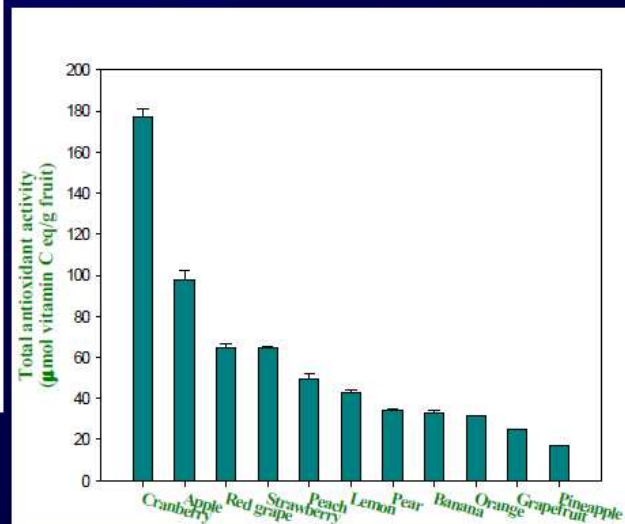
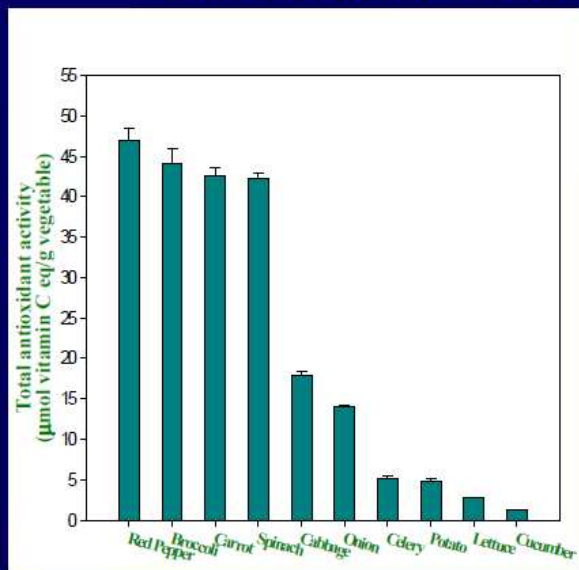
What about mechanisms?

John MILNER

Division of Cancer Prevention, National Cancer Institute, National Institutes of Health, Health and Human Services, Rockville, USA

I think we already can say that diet is important for cancer prevention. It is typically recognised that about 30% of cancers relate to dietary habits. While there is wealth of evidence from preclinical models and from human investigations, that there is a lot of variability across studies. We do not always obtain consistent results, making interpretation difficult if not impossible. Part of that comes from a lot of variability in the food supply and with a lot of variability in genetic across individuals. One of the ways we attempt to integrate the benefits of food is to deal with a specific process, such as the antioxidant potential.

Not All Fruits and Vegetables are Equal! Antioxidant Activity Vary Markedly!!



Sun et al., J. Agri. Food Chem. 50: 7449-7454, 2002

What is quickly observed is that not all food is equivalent in their antioxidant potential. Certainly not all vegetables and not all fruits are equivalent. Lump of all of this together as fruit and vegetables is inappropriate. Maybe it would be wiser to highlight specifics about individual food items and their overall benefits, especially as they relate to the cancer process. Again the food supply it is quite variable since

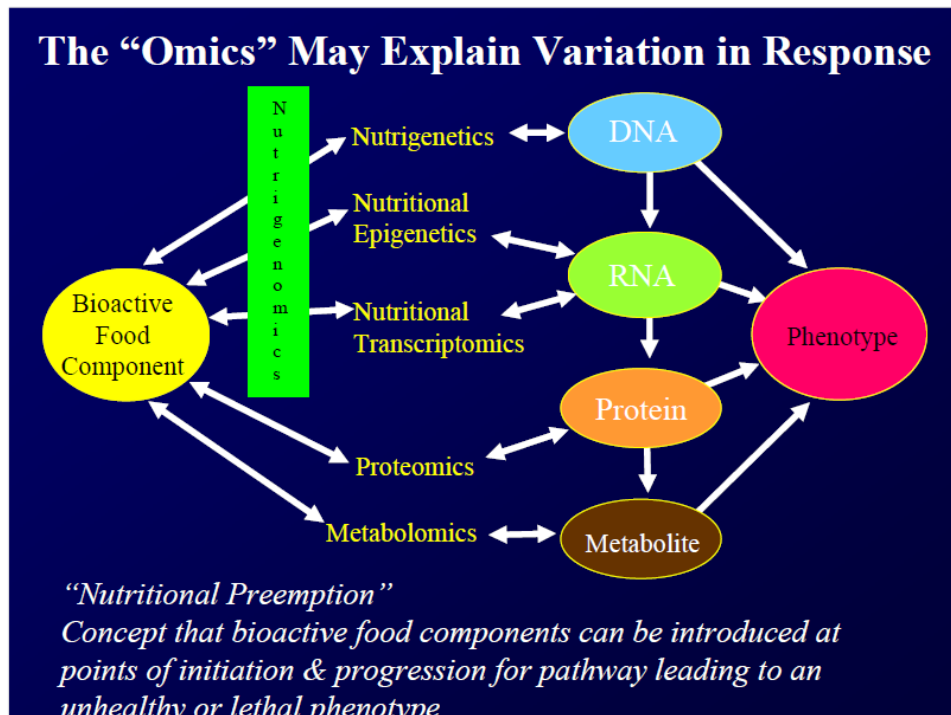
the content is highly dependent on the growing conditions and the type of fruit and vegetable being examined.

The effectiveness as an antioxidant is highly dependent on the molecule that is being modified. Figure (2) provides evidence that not all the compounds are equivalent. In fact while some are very effective in blocking peroxides while others are much more effective in modifying nitrogen radicals. So we have a combination of information to begin thinking about the anticancer properties of fruits and vegetables. The next issue is whether the response is a result of one or multiple processes; I submit to you it is multiple.

Speciation Is Bioactive Component is Important!! Radical scavenging - flavonoids			
Scavenging rate constants of flavonoids for oxidizing radicals			
Substance (trivial name) (substitution pattern)	Rate constant ($\times 10^8 \text{ M}^{-1} \text{ s}^{-1}$)		
	$\bullet\text{OH}$	$\bullet\text{N}_3$	$t\text{-BuO}^\bullet$
Flavanols			
(+)-catechin (3,5,7,3',4'-penta-OH)	66	50	1.35
(-)-epicatechin (- " -)	64	51	-
Flavanones, Dihydroflavonols			
naringenin (5,7,4'-tri-OH)	210	52	2.65
dihydrofisetin (3,7,3',4'-tetra-OH)	67	56	-
eriodictyol (5,7,3',4'-tetra-OH)	117	47	0.8
dihydrokaempferol (3,5,7,4'-tetra-OH)	58	89	0.95
dihydroquercetin (3,5,7,3',4'-penta-OH)	103	43	1.0
Flavylium salts (anthocyanidins)			
pelargonidine chloride (3,5,7,4'-tetra-OH)	45	62	-
Flavones			
apigenin (5,7,4'-tri-OH)	135	48	3.0
luteolin (5,7,3',4'-tetra-OH)	130	41	5.7
Flavonols (3-hydroxyflavones)			
kaempferol (3,5,7,4'-tetra-OH)	141	88	6.0
quercetin (3,5,7,3',4'-penta-OH)	51	66	6.6

The reaction of flavonoid aglycones with the electrophilic radicals $\bullet\text{OH}$ or $\bullet\text{N}_3$ are at the diffusion-controlled limits but within the same region for almost all investigated compounds. The anti-oxidant principle is based on the number and position of the various hydroxy groups. Other oxidizing radicals, e.g. $t\text{-BuO}^\bullet$, O_2^\bullet , ROO^\bullet , etc. also react effectively with flavonoids, all forming the same transient aroxyl radicals. (Bors W *et al.* (1992) in: *Free Radicals and the Liver*, Csomos & Feher, eds, Springer, Berlin, pp. 77.)

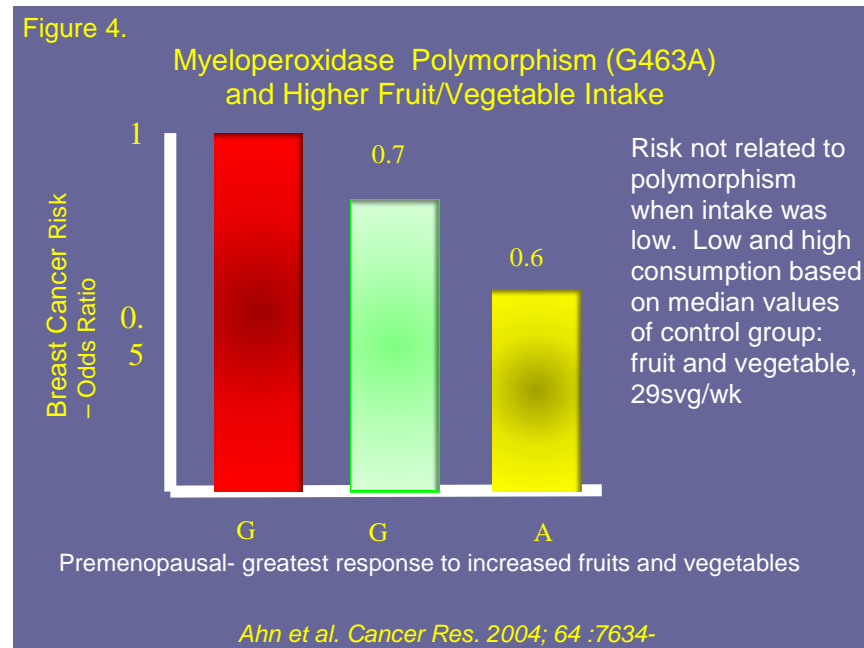
Step back and realize that we are not all the same we are in fact enormously different individuals. There are not perfect role models for understanding the effects of diet on the cancer process. If you are not aware of this difference between a little Chihuahua and a Dalmatian dog it is partially due to a polymorphism in IGF. Thus a slight change in gene expression can have a profound effect on phenotype and it is certainly the case when it comes to human investigation. I am quite surprise today in the all topic in nutrigenomics that we need to start thinking that the genes do set a tone for the actions of food components but it is not only the genes it is also the food compounds interaction with epigenomic events, as well as the formation of a message at MRNA.



That collectively is referred to as nutrigenomics clearly all of those impact phenotype. The downstream from that are actually the proteomics and metabolomic. Those are clearly influenced by bioactive food component that we consume on a daily basis. It would be not nice if in fact there was a linear response from genes all the way down to metabolome but that is not reality. In fact, there is enormous variability and you can not just look at one of those components but you have to look at multiple components. That means that bioinformatics is really going to be a key for us to understand that individuality in response and who is really going to benefit and who is not going to benefit from intervention strategies. I might just point out by the way that the mind set at least what we have been talking about the MCI is that in fact not all people are going to respond identically and by knowing something about the “omics” as we defined them we are actually able to intervene at different points. That is a concept called nutritional preemption. Knowing something about the individuals gives an important strategy for intervening.

That also applies that not all people should get the same type of intervention. Some will benefit far more than others. As you already heard from Dr Lampe there is certainly some evidence out there that the gene polymorphism can set a tone for the response to food components. I will show you a couple of quick examples. By the way there are 30'000 genes and probably somewhere between 5 and 8 million SNPs (polymorphisms) so we clearly have got a massive undertaking to understand all of that genetic that is out there and remember that is not the genetic component.

Nevertheless there is some evidence that those polymorphisms can influence the response to food or food components. The example of Myeloperoxidase is associated with the release of oxygen radical from with cells; simply put a burst of oxygen is associated with an inflammatory type of response. What is interesting from the data on the Figure 4 is that the polymorphisms with the AA allele appeared to be much more responsive to higher fruit and vegetable intake in the diet that those that have GG allele. The *heterozygote* is somewhere in the middle. It turns out that this is about 30, 35% of the population so in fact if we are talking about health benefits of fruit and



vegetables it may well be a subpopulation.

We have a subgroup that is much more responsive and for the other people it does not appear to really matter. From a collection of total fruits and vegetables that may be the case but I suspect that is much more complex than that. In fact, the response to a specific food such as tomatoes

(or Lycopene) another polymorphism that is associated with the response will likely surface.

In this case it his is actually a DNA repaired gene. What you can notice with this one is the low risk of the arginine/glutamine or glutamine/glutamine groups you have the homozygote and the heterozygote and it does not really matter how much tomato is consumed. However, in the other group what happen is that there is about a 5 fold difference in risk depending on whether a low or a high consumer.

***XRCC1* (Arg399Gln) Polymorphisms May Influence the Response to Lycopene**

n=77 CaP pts; n=174 controls

Lycopene Intake (µg/day)	Arg/Gln + Gln/Gln "low-risk"	Arg/Arg "high-risk"
High	0.82 (0.33-2.01)	0.21 (0.06-0.71)
Medium	0.97 (0.39-2.44)	0.59 (0.23-1.50)
Low	1.0	1.0

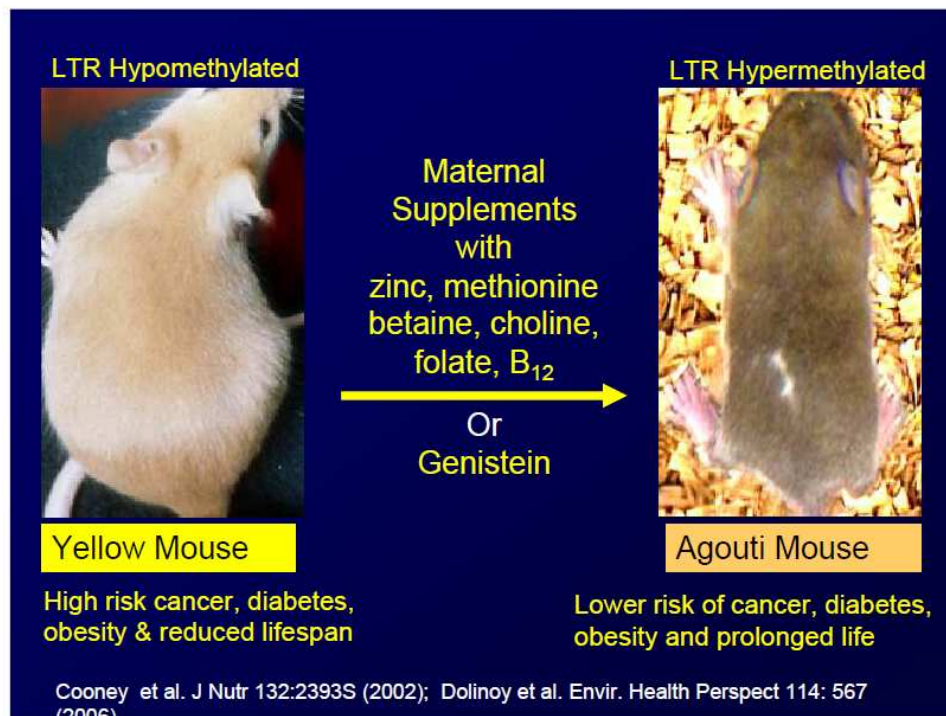
*P trend < 0.01

Goodman et al., Nutr. CA, 55(1):13-20, 2006.

That means that for clinical studies one must take into consideration the variation in genotype by not characterizing the genes one is examining a mixed population and does not really understand what is being examined or observed.

Life is little bit more that just genes, in fact epigenetic processes can also dictate the overall behavior to diet. It includes methylation reactions, as well as the *histone* homeostasis, which is involved obviously how we coil the DNA. A number of nutrients can modify both of those processes. From A to Z, can modify methylation reaction; energy consumption can modify methylation reaction the classic is folic acid deficiency causing global hypomethylation in a site specific hypermethylation. But as I said there are lot nutrients that are out there that also modify that process.

Some of the most compiling evidence of this process is modifying by diet comes from preclinical studies in the rodent model. This is the Agouti model that demonstrated that if one takes a little yellow mouse and feeds her a typical diet she will give birth to other yellow mice. That is not surprising! However, if one fortifies the diet with component that modifies methylation the color of the offspring changes to ajouti. You can notice at the top of the picture there is a hypermethylation that occurs on the long term repeating unit and that is the reason there is a change in the hair color. But that is not what is really important. What is really important is the yellow mice are obese, have high frequency of diabetes and have an increased cancer risk. When you fortify the mom's diet the offspring have a lowest risk of diabetes, obesity and cancer.



What is interesting is the change in methylation reaction that you can also bring about by adding genistein to the diet, genistein from soya beans. Genistein does not supply a methyl group, so these are changes that are occurring in methylation and this is probably some signal of the nuclear factor that is leading to this change.

Let's point out why it is so intriguing. We heard this morning about feeding a children and what happen to the offspring etc. of those children. I want to point out that if you actually over feed a mouse the offspring have a propensity to overeat for 7 generations. If you underfeed a mouse the offspring has a propensity to under eat for about 5 generations. Why? Is it methylation products that are being modified for generations? If so, it is not what you are eating now but actually what you mom's mom mom's mom ate that is setting the tone for your cancer risk and we have not even started to thing about those kinds of variables in humans.

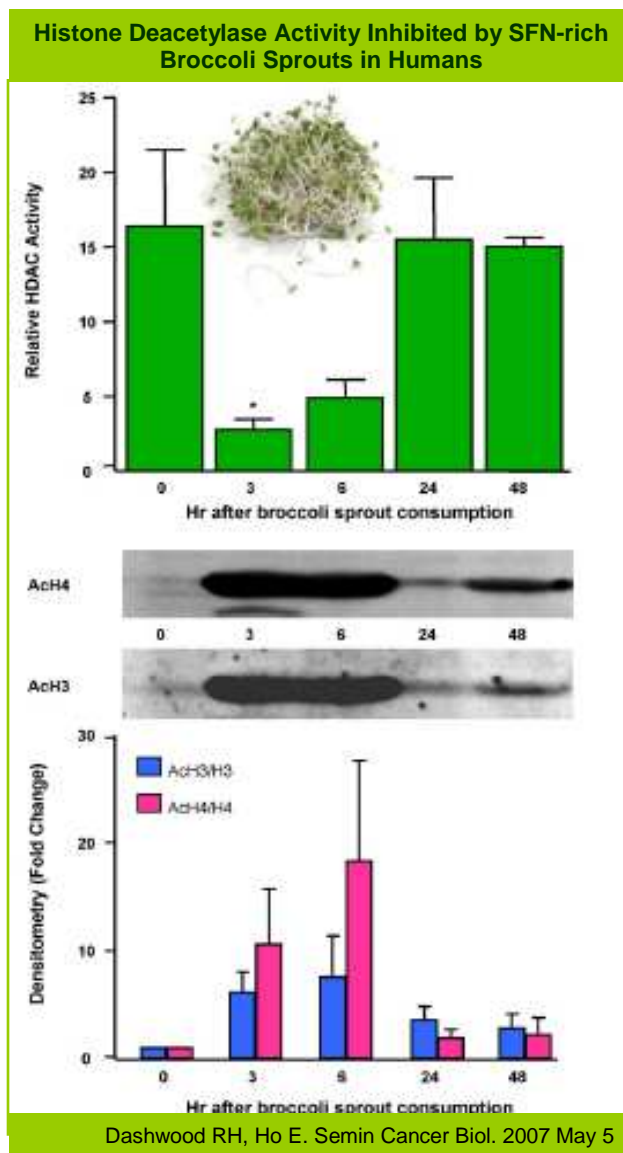
I said histone were also important. I want to point out that there is some evidence that several food items certainly regulate this process, including fiber, garlic and there is some evidence of sulforaphane. These food items are then important for modifying cell signals or setting a tone for whether pro- and antitumorigenic genes are being expressed.

These are some data from a human feeding study with broccoli sprouts. These are pretty high in sulforaphane, about 100 times higher than the *flower*. Providing causes a 90% reduction in histone deacetylase: within 3 hours, which is incredible. Within 24 hours it goes back up to a supposedly normal amount. What is interesting when it comes down to potentially modifying the risk of cancer by changing gene expression patterns? However, we do not really know what that means for growing child or reproducing woman. These are issues that we need to start thinking about. There are target populations who will really benefit from this and there is some other population that might place at risk because of these intakes.

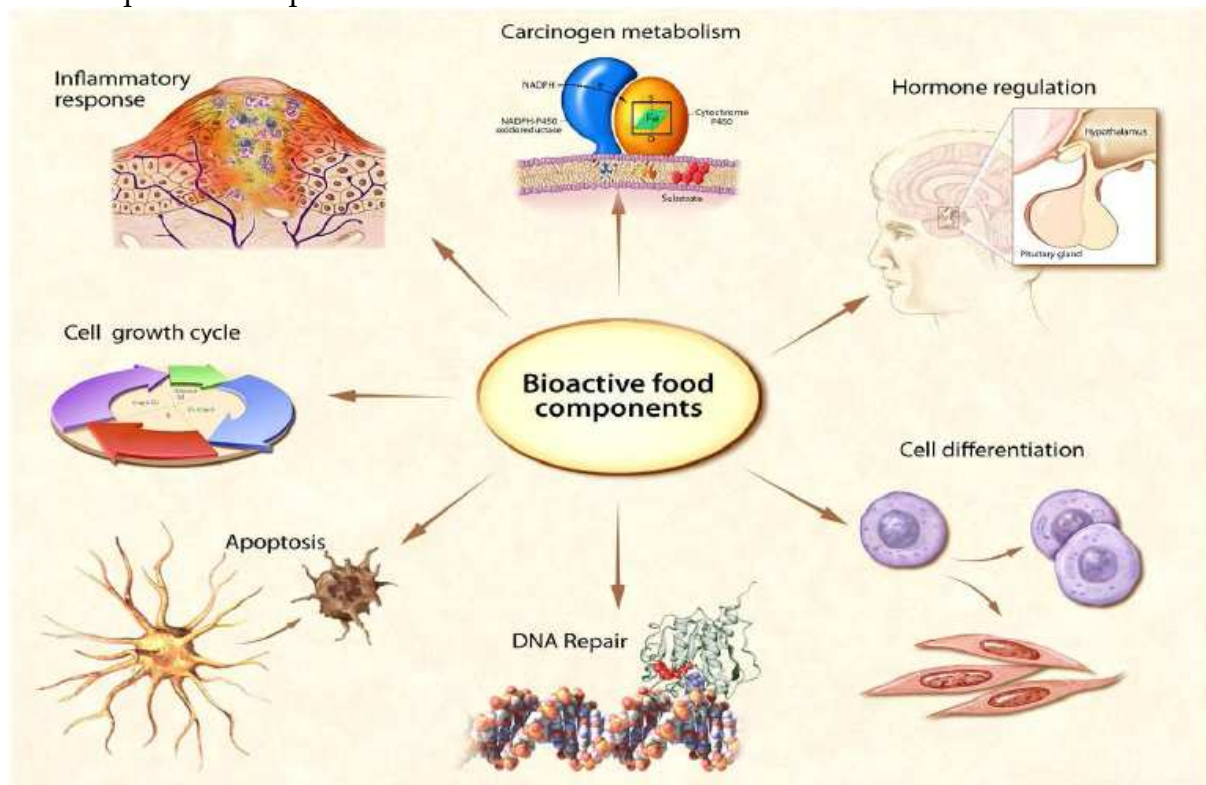
Talking about exposure we have a lot of data indicating that we can actually modify gene expression patterns change the message in the DNA just by the *bolus* of a food. Many cells processes modify dependant on the timing, on the exposure and we can see it in humans, we can see it within 3 hours after consuming foods. We are now seeing if you give a high carbohydrate versus high protein cereals that you can pick up changes in with cells within 3 hours.

Is it where we have got to be moving? I believe so! We actually can undertake *bolus* studies to provide clues about subpopulation that are going to be really responsive and those who are not going to be responsive to an intervention. I think that is what we are going to be headed and if you actually think about the old days of vitamins literature that is what we did. We identified those responders by testing a *bolus* challenge.

I have to say something about proteomics. I think that is the new wave of research as it relates to diet and cancer prevention. Multiple changes in proteins including phosphorylation, thiol regulation, etc. can modify the behavior of proteins. More information is needed to understand if the response in a tumor is similar to what



occurs in normal cells. Regardless, these changes are going to be important to tell us about what processes are being modified. When it comes to processes some of the most important are provided in the next slide.



We have identified some of those processes that we believe are the most critical for explaining the cancer process. They can go everywhere from the DNA repaired down at the bottom all the way until the top to the inflammatory. Any one of these processes can be important for determining overall cancer risk or tumor behavior. Which one of these processes is modified first? This is the question that is before us. And what is the effective concentration of a bioactive constituent from a fruit or vegetable that is needed to lead to that change? This is related to the overall question that is before us today, namely when are fruits and vegetables most beneficial and to whom.

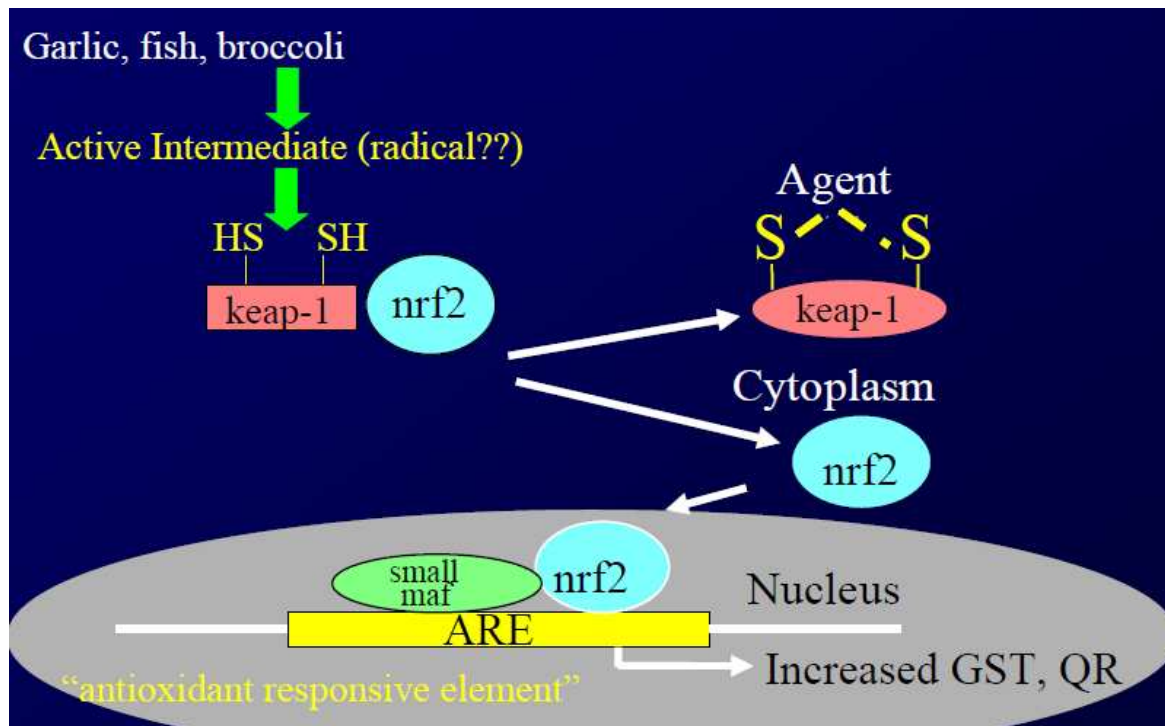
If you take that DNA repaired that I mentioned was one of those critical processes we actually already have some data that you can change that “destruction” of the DNA by intervening with fruits and vegetables. The problem with this study is that there are relatively few literatures. Since there was *no wash-out period* between the interventions one can not really tell which food item per se is leading to a change. How much inflammation is occurring after these interventions, how much (dose) is needed to get this kind of response? I think those are the issues that we have got to be talking about in the future.

We need to think also about something else. What is the process that really needs to be modified? Are we modifying the normal cell or we are modifying the neoplastic

cell? We have a lot of evidence that we can actually add a lot of food components to normal cells and it does not do very much until you get to super concentration. But neoplastic cells tend to be much more responsive. In the non-neoplastic high concentrations are needed before anything is observed. For example with allyl sulfur, one of the active components that are in garlic, it slows down cell division. That is probably because of a change in thiols in proteins, what I mentioned earlier as a regulator site. Interestingly, allyl sulfur actually modifies *ferritin* concentrations. *Ferritin* is an iron source. Allyl sulfur is causing iron to be released from *ferritin* then the iron serves to enhance the *fenton* reaction to generate free radicals. That means that allyl sulfurs are not serving as antioxidants, but serving as *prooxidants* and absolutely when it gets the concentration high serving in *prooxidants* and lead to the *reduction in cell division and apoptotic* response. That is not limited that allyl sulfurs since the same type of response occurs with flavonoids. When I think of those antioxidants when provided in high concentrations they actually serve as prooxidants and lead to free radicals generation, in part because of the unsaturation in those molecules.

So we have got many things going on in the cell but we need to remember when are we actually looking at the response? Are we looking at it as a normal response or a neoplastic response? I think this is something we really did not take enough time teasing apart.

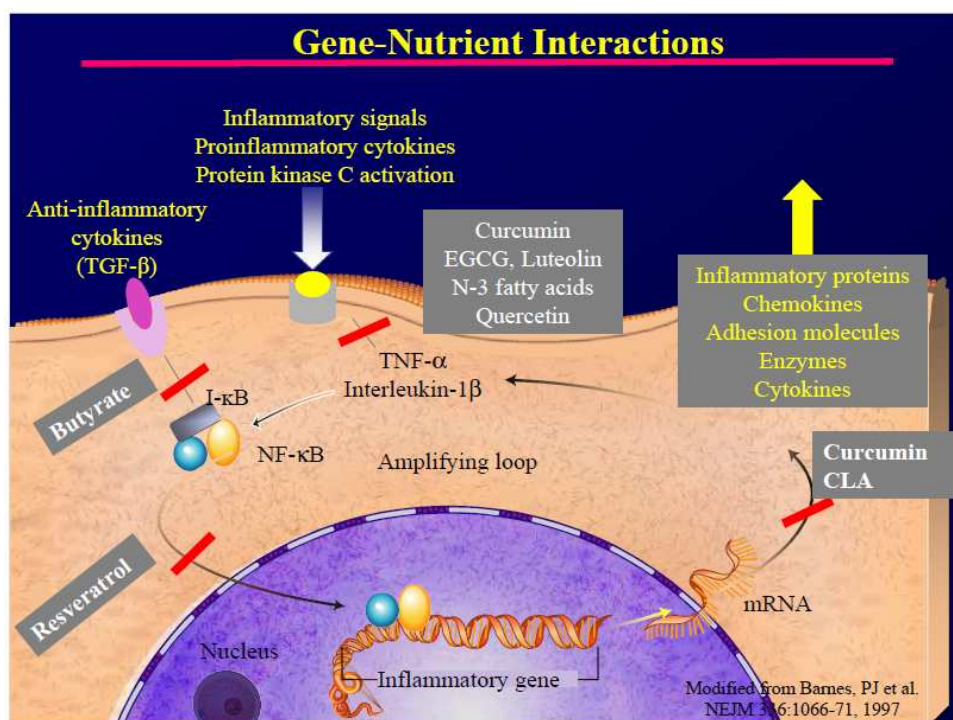
Dr Lampe provided you some evidence that we can give a lot of food items that block Phase I and Phase II enzymes; there is no question about that. There are relatively few deficiencies per se that lead to an increase in cancer. Actually I only know of two, one is a *methyl donor* insufficiency that leads to increased hepatic cancer “spontaneous hepatic cancer” and the other is more recent study that suggest that when you feed a low vitamin D, low calcium diet increases colonic tumors when fed longterm. But for the most part we are really not looking at deficiencies causing tumor, we are looking supplemental nutrients modifying the risk of cancer.



One of the molecular targets that have been identified when it comes to modifying the risk of cancer is the all nuclear transcription factor NRF2. It is a very interesting nuclear transcription factor that promotes the formation of glutathione S-transferase and oxido-reductase activity. Food items cause NRF2 to dissociate going to the nucleus and to promote the formation of these detoxication enzymes. Multiple food items can do that such as garlic allyl sulfurs, selenium from fish and sulforatane from broccoli.

The problem is if one has not done a very good analysis of the eating pattern and only examines on food such as broccoli, and therefore not considered selenium from fish and other of these food items that are modifying this process false conclusion may be reached since they have the same site of action. Activities can only increase so much so if I eat a lot of broccoli does that mean that I get no benefit from garlic or vice versa? These are issues we need to start spending some time dealing with and we haven't done enough to understand these inter-relationships at this point.

One of the topics that is really hard these days is the inflammatory risk response.



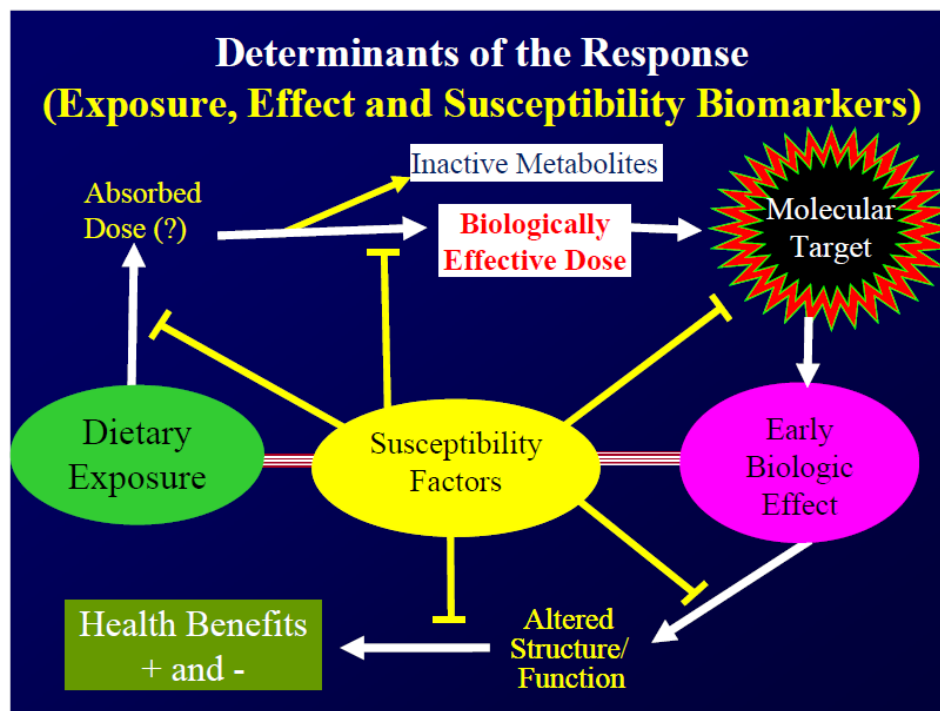
Remember in a normal process we need to have a normal inflammatory reaction but when it gets out of control the process cycle goes at a very rapid rate. When it goes at rapid rate we typically have an increase in cancer risk. Some people argue 40 to 50% that the cancers are associated with an increase in inflammatory process. That means that when I have that process those food components become even more important. That means that somehow I need to monitor the insult that is causing the inflammation (bacteria, virus, excess calories, etc.) to predict a benefit from the food. From this slide you see that there are a lot of items including fiber (butyrate) to conjugating linoleic acids (from animal products) to the spice curcumin that can modify the process. Again interactions of food are very important in determining the overall response. If you look at curcumin literature considerable variability is found in the decrease the inflammatory response. Individual variability probably comes down to the absorption of the curcumin and the metabolism of the curcumin as well as the degree of insult fostering the inflammatory process.

These processes cross talk I thought I would show an example from a colleague the author Elaine Lanza who is actually working on various projects that relate to fiber and its relationship to the inflammatory process as well as its ability to modify factors that are associated with insulin and RGF. I just want to point out that NF-κB can modify such signals that are associated with insulin as well as all the downstream within associated with insulin.

So one of the issue that I want to raise with you is why would Mother Nature allow fruits and vegetables to modify multiple processes? Why would so many processes change simultaneously? That is probably one of the benefits of food, over drugs.

Food actually influence multiple targets not just a single target. For foods to have multiple targets it is all logical that there is some intracellular change that is leading to this. Could it be intracellular calcium? Could it be pH? Could it be all kinds of things that are actually turning out the signal that is changing many things inside the cells? I do not think that we know the answers to it but those are again questions that need to be addressed. We have to step back and ask ourselves what kind of information we really know, need to have to determine whether we have a response. This comes down to 3 biomarkers that are:

- certainly *Exposure* (dietary exposure or biological indicators);
- *effect*, we need to know what we are trying to modify that is the cellular process, what is the target within that process that we really trying to modify ;
- and then the *susceptibility biomarkers* those are really nutrient interaction and gene nutrient interaction that determine the overall response.



Indeed this is an incredibly complex area that we need to know a lot more about. There a lot of food that are in the food supply that could conceivably modify the cancer process but there are few that likely deserve a lot more attention. We can list them from the well known Time Magazine (January 21, 2002) with adding a few extra foods in there:

- soya beans,
- tomatoes and lycopene,
- spinach and the folic acids,
- broccoli and sulforaphane,
- garlic and allyl sulfurs,
- nuts and some very interesting flavonoids and interesting proteins,

- salmon- n-3 fatty acids,
- oats with fiber and flavonoids,
- blueberries for antioxidants,
- curcumin,
- green tea probably does not matter if it is green or black tea,
- red wine that I prefer to wash it down over the green tea!

I will finish with one slide about the future. I think we need to develop some predictive models because not everybody is going to respond the same way. That means a personalized approach to nutrient and cancer prevention. We are going to use strategies that are built along the “omics” and in fact we are going to deal with nutritional preemption. We have got a lot of people involved in this and not only the people that are eating these food items but the food industry, government and academia need to build partnerships!

Q&A

PUBLIC (from Puerto Rico): Based on the information you showed us today I am concerned about the recommendation of the National Cancer Institute regarding to avoid supplementation for everybody when we do not really know that is going to help for some people. What do you think about it?

J MILNER: That is a great question. If you look at the World Cancer Research recommendation, those are the global recommendations, there are the Public Health recommendations that I think are appropriated for the general message. The use of supplements is generally considered to not place anybody at risk. However, I think what we are headed to much more about personalized approach such that some individuals may really benefit from higher intakes either from foods or supplements. The message is for the public but most want to know I «What about me??” I want to know what I should be consuming. What I said to you at the end is that yes I want those recommendations that are globally but I want those focused on the 12 items that are back there because I think that is really where most the information is going to come from. The confusing part of my presentation was I just told that not everybody is going to respond the same way.

PUBLIC (Philip JAMES): I think you are now making people very depressed John because you are requiring a wealth of new techniques which are totally reasonable. But if you take a slightly different view, I mean if you look across the world you started off with Doll and Peto analysis which is amazingly crude if I remember correctly but they actually had a variation of 20 to 70% of from diet and they plumbed for an average of 35%. You appear to be focusing on a personalized process because you are trying to discriminate for example within a particular country the

discriminant which lead to those individuals developing cancer. What if you look in a different way across the world and you see 10 to 100 fold differences? Can we not begin to use your analytical approaches in a much more illuminating way because you could ask the question are those 10 to 100 fold differences explained by your key genetic differences or responses? Or could it be explained by diet? Because if you are thinking in practical terms, you might be able to come out with a much more coherent general case years before you could come up with your specific individualized approach to prevention.

J MILNER: I am not disagree with that and I think in fact that if you start looking at the gene polymorphism they do vary by population and we are going to see some variance here. We need to go back and start looking at it from that context that may lead to some important clue. As I said there are 30 000 genes and probably 8 to 10 millions SNPs, so it is very difficult to conclude anything at this point. I have to admit to a large extent except for a couple of studies and few other that most evidence is guilt by association. We need to go back to those apparent responsive populations and do a quick intervention studies that incorporates some relevant biomarkers. That was my point with the transcriptomic issue; if we are going to identify population we can do some of those challenge tests and get some real clues about actually sub-population rather than individual responses. I think that is what we headed.

I indicated the World Cancer Research indicated that with higher calcium intake there was about a 20% reduction in colon cancer. If you look at the data per se it is pretty iffy. But, if you start look at the vitamin D receptor the 20 % now moves to about a 3 to 4 fold change in risk, depending on the polymorphism that is there. Now, I actually have a subgroup that I need to be dealing with because there are the one that are going to be the most responsive to calcium and I think there are going to be some of these genes we can identify very quickly and actually start talking about subpopulation. Such interventions may be far more important in one area of the world that it is in another.

A SCHATZKIN: I will just sneak a comment. Even if it is true that there are subgroups that are more responsive to calcium or whatever or let say to sodium to cardiovascular disease or even smoking for cancer and maybe this is an extension of what Phil was sort of getting at, does it make sense it would be great if we had all of the information that would enable us to identify all the genetic variation that determine response. It may be incredibly complicated as I believe you were suggesting John even so complicated that it would be intractable. Does it not make sense therefore that we make overall Public Health recommendations about fruit and vegetable intake, sodium consumptions, smoking recognizing that there would be genetic intrinsic personal variation? But by shifting the exposure in the population as a whole you end up saving lots and lots of lives although there would be lots of variation in the population due to how people respond.

J MILNER You still may not get enough into some populations that would need more and benefit most. That is the only issue with a public health versus personalized approach. I think the Public Health message that says we need to eat more fruits and vegetables are appropriate. However we are not hogs I still think we have to be headed to this more personalized approach. In the old days we talked about type 4 hyperlipoproteonemia as a carbohydrate induced elevation in cholesterol, which is about 20% of the population or maybe a little bit less. When you tell people to eat a low fat diet they are immediately consuming more carbohydrates and those individuals are in increased risk and we fail to talk about those vulnerable individuals! I think we need to start talking about it; we need to start talking about individuality and responsiveness to individuals. Maybe the word "individual" is wrong, it is truly "subpopulations". But I think we need to start dealing with and I do not think "one size fits all". There is a lot of individual responsiveness and some people as I showed you are going to get a little response and others may get a lot. The lycopene story presented is a good example, if we only *recommended to the general public to consume a little more* it might actually not benefit one group as much since they may need considerably more. .

PUBLIC: Je vais continuer sur vos propos. J'ai vu à travers votre étude que sur le produit brocoli les résultats étaient plus que probants. Vous faites certainement allusion à la recherche du groupe SEMINIS sur une graine puisque c'est le premier ensemençier mondial qui vient effectivement de découvrir, qui a mis au point un brocoli qui serait à plus de 50 fois d'après ce qu'ils disent dans des teneurs d'antioxydants pour éradiquer les radicaux libres. Nous sommes nous-mêmes un groupe de producteurs de fruits et légumes sur l'Europe et nous sommes justement en train de nous développer puisque l'entreprise a une vocation de la santé et de bien-être en passant par la nutrition. Est-ce qu'aujourd'hui vous nous inciter à continuer dans cette direction qui va bien-sûr par une culture différente du produit, le groupe SEMINIS en est la preuve avec son brocoli, le résultat est là puisqu'il sera donc à la commercialisation en début d'année 2009 à travers le monde entier. Inciter vous encore des producteurs et des groupes de recherches à aller dans ce sens c'est-à-dire de faire la recherche génétique de produits d'antioxydants? On sait que des cultures particulières telles qu'à base de sélénium renforcent se type de produits. J'ai une seconde question plus simple.

Pour information personnelle, dans toutes les études qui nous ont été montrées par les orateurs aujourd'hui il est vrai qu'il aurait été bon de connaître par rapport à ce que vous venez de dire, qu'elles étaient dans les études les produits qui étaient étudiés car c'est vrai que bien souvent on donne la dénomination fruit et légumes, on s'attend qu'un brocoli ou un chou n'aura pas du tout la même consonance en matière d'antioxydants qu'un agrume donc il est vrai que les résultats des travaux peuvent effectivement avoir une différence et cela il faut le savoir, de 30 à 70%. Pour les

novices tels que nous-mêmes il est souhaitable d'avoir des précisions sur les produits qui sont étudiés.

J MILNER: As I said these are my opinions and not necessarily those of the National Cancer Institute. I will answer your question by saying that I think there is an opportunity to discuss specialized products for health benefits. I think that you are right that the broccoli sprouts are one example and I think we are going to find a similar approach for a lot of foods. You can find certain seeds from oats and wheat that have higher content of flavonoids and it may well be developing those who are better products and overall that would be a benefit. The part of me that says be careful is over indulgence of any of these nutrients can be harmful and there probably is a subgroup that is placed at risk from exaggerated intakes of any nutrients. We have to be cautious with this, we have to do some testing of these things but I think that is where we headed. If we can actually show that some of these products really are effective and that there are really doing something, why not. And I do not care if it lycopene or any other kind of compound in the food supply but I will say to you we have to be careful. I don't think many of us would have ever thought that folic acid was going to create a problem but I am not sure we know how much of a problem it is at this point. But there may well be a subgroup that is placed at risk, in this case increased cancer. You heard about this morning with the Vitamin E story; excessive vitamin E might be harmful to a subgroup and might increased risk of cardiac problems. We are going to have to think about how to use nutrigenomics to identify vulnerable populations.

A SCHATZKIN: We have raised a number of methodological as well biological issues. There certainly is potential in the future that fruit and vegetables intake will reduced the risk of cancer and perhaps mortality from it but there are clearly works to be done.

SESSION 11

EFFECTIVE INTERVENTION STUDIES TARGETING CHILDREN

Chairs: **C.Perez-Rodrigo** and **Ch. Rowley**

- Determinants of F&V consumption. **C.Perez-Rodrigo**
- School fruit and vegetable schemes: an international review of effectiveness. **K. Lock**
- New Zealand's Fruit in Schools program, a public/private partnership in action. **P. Dudley**
- Results of the Pro Children Study. **S. Te Velde**
- Free school fruit might give long term effects – Results from the Norwegian intervention study FVMM. **E. Bere**

Determinants of F&V consumption

Carmen PEREZ-RODRIGO

Community Nutrition Unit, Bilbao, Spain

We know that food habits in general are complex in nature. If we look particularly in habits in children and young people there are many areas of interests that are influencing what they eat, what they would like to eat and what they do. Particularly the family is very important especially when they are very young. Then when they come at school age, school becomes very important. Also the friends and Peers make a strong influence, community where they live and we can not forget either about the personal factors that are important in diet and the environment surrounding them, including mass media, marketing and publicity that they are exposed to. All these areas of influences have been arranged and have been tried to be understood, by different models and theories all waiting the determinants involved. In more recent years, ecological models have gain more attention. Such models like for instance the ANGELO framework focus on environment divided with the microenvironment looking into groups of people and the macro environment as the broader infrastructure surrounding people. There is also a classification regarding the type like physical environment such as the food available and easy to access, sociocultural environment like social norms, subjective norms, parental influences, peer pressure etc., the economical environment as cost related issues or the political environment. We focus on children and adolescent eating behaviour and we look at the different areas where they live. The household level, the school level, the neighbourhood where they live and the city and municipality are the main areas of interest we should look into both the way of understanding the way they eat and how they eat what they eat but also with the main focus by understanding this we would be able to better tailor the kind of intervention we are more likely to be effective.

Micro and macroenvironmental correlates of dietary intakes among children (3- to 12-year olds)			
Home/household Physical		Sociocultural	
Energy			
Accessibility to food	Neg	Parental intake	
Minutes foods present at home		Parenting practices	
Fat (total fat, energy percent fat)		Control/restriction/discouragement	Neg
Accessibility to food		Encouragement/assistance/prompts to increase food intake	
Minutes foods present at home		Food as reward	
Fruit, juice, vegetables		Parents' negative statements about foods	Neg
Availability	Positive	Family support	
Accessibility	Positive	Minutes spent eating at home	
Home F&V barriers	Neg	No meals eaten out	
Television on during meals	Neg	Marital status parents	
Snacks, fast food		Food presentations/food offers	Positive
Television on during meals		Fat (total fat, energy percent fat)	
Soft drink		Parental intake	Positive
Television on during meals	Neg	Parenting practices	
Availability			
Sociocultural			

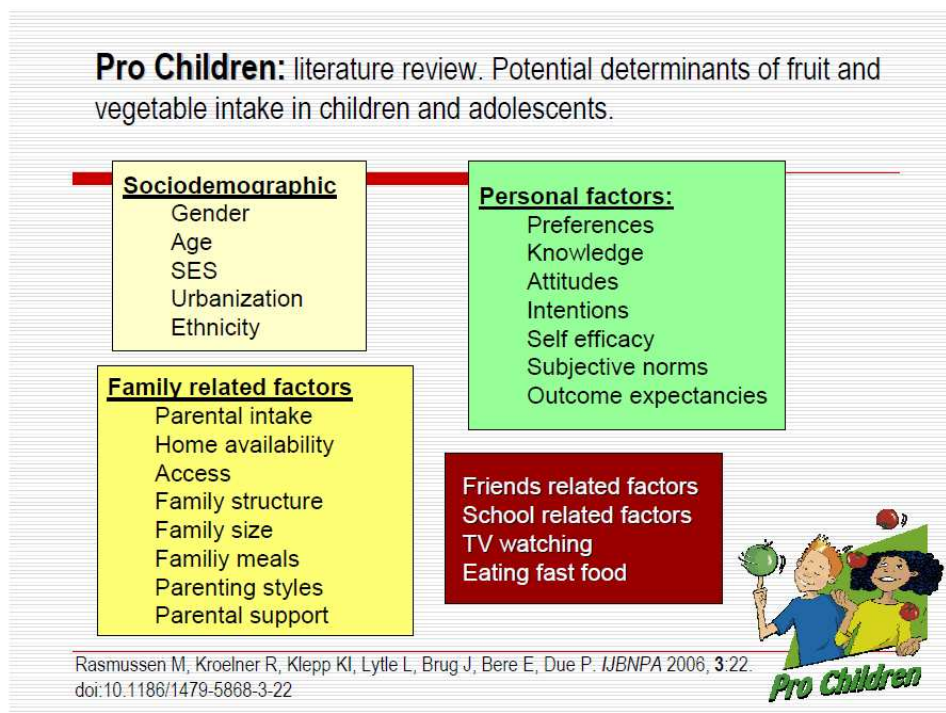
van der Horst K, Oenema A, Ferreira I, Wendel-Vos W, Giskes K, van Lenthe F, Brug J. A systematic review of environmental correlates of obesity-related dietary behaviors in youth Health Education Research 2006; doi:10.1093/her/cyl069

We already have some evidences build looking into micro and macro environments surrounding children in relation to what they eat.

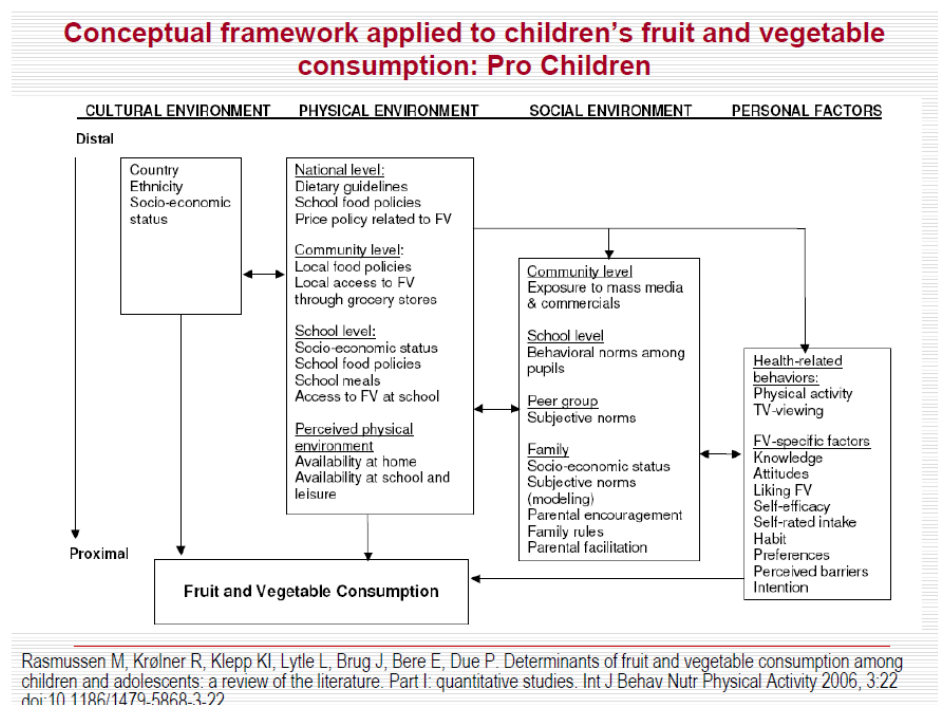
For instance in this comprehensive literature review on evidence conducted in the Netherlands are looking into data behaviours related to obesity and already in this review conducted in 2006 we could see that F&V appeared and the family environment to micro/macro environment especially where are high level at home and easy to access have a positive influence in the amount and types and variety of F&V that children consume. On the other hand some of the features like for instance barriers to access of F&V or TV view on during meals and longer TV exposure have a negative impact on consumption of F&V among children.

The Pro Children study is an European funded survey and intervention that was conducted between 2002 and 2006 and it was focused on 10 to 12 years old children and we are looking into F&V consumption in determinant influencing those. On the other hand, we tested a pilot intervention and its effectiveness.

There 5 different blocks of determinants on F&V consumption namely socio-demographic factors like gender, age, socioeconomic levels, urbanisation and ethnicity, personal factors such as preferences; knowledge, attitudes toward F&V, intention, self-efficacy, subjective norms and outcome expectancies; family related factors like parental intake, home availability and access, family structure, family size, family meals and also some other factors that were identified such as friends related factors, school related factors, TV viewing or eating fast-food.



We constructed model trying to explain on how to harmonize all these different factors looking into the environments that we defined as a cultural environment, the physical environment, the social environment and personal factors and linking those together and how they influence F&V consumption in this specific population group.



In order to investigate determinant factors, we had 3 different approaches. The first literature review was conducted looking into determinants of F&V in children age 6 years to 12 years and the literature review went back up to 1966 up to 2004. So it included a long period of time on all surveys conducted in that period. Following on the slides some of the conclusions of what evidence we do have relating determinant factors for F&V consumption in children.

Summary of potential determinants of fruit and vegetable consumption among children and adolescents. Determinants included in at least three papers.

Determinant variable	Association/group with highest level of intake	No association
Sociodemographic factors		
Gender	Girls: (27 studies)	18 studies
	Boys: (4 studies)	
Age/grade	Neg. assoc: (9 studies)	9 studies
	Pos. assoc: (3 studies)	
Family-related factors	Pos. Assoc (38 studies)	19 studies
	Neg. assoc: (3 studies)	
Race/ethnicity	Assoc (15 studies)	6 studies
Urbanisation	Rural (3 studies)	1 study
Personal factors		
Preferences	Pos. assoc: (11 studies)	-
Nutritional knowledge	Pos. Assoc (6 studies)	1 study
	Neg. Assoc (1 study)	
Attitudes	Pos. assoc: (3 studies)	-
Intentions	Pos. assoc: (2 studies)	2 studies
Self-efficacy	Pos. assoc: (6 studies)	2 studies
Outcome expectations	Pos. assoc: (1 studies)	4 studies
Perceived barriers	Low barriers: (1 studies)	2 studies
Subjective norms (perception of others' attitude on own diet)	Pos. Assoc (3 studies)	

Rasmussen M, et al. *Int J Behav Nutr Physical Activity* 2006, 3:22 doi:10.1186/1479-5868-3-22

We know that gender is an influence factor and most of studies show that girls tend to have higher consumption of F&V than boys do. Also age is an influencing factor although in this sense not all the studies show the same kind of evidences. In some studies it is younger children who eat more F&V and then it decreases consumption, in other studies it is not the case. Family-related factors show a positive association, so when there is a higher consumption in the whole family children also have higher consumption of F&V. Ethnicity is not a unique trend, there are controversial results although it seems like more socio-economical related factor and regarding urbanisation the results are not conclusive either although in some studies in rural areas the consumption was higher. Regarding personal factors, it is quite unanimous that children who have a higher preference or a wider scope, more variety of preferences do consume a higher amount of F&V. When children are more aware about the nutritional relevance and know more the nutritional recommendations guidelines on F&V they eat more. Also a positive attitude for F&V has been also seen as a positive influence. Intentions is not conclusive so some studies say yes, intentions are important for consumption of F&V while others are not having the same conclusions. Self-efficacy in different domains, there is evidence that it is associated with higher consumption while outcome expectations did not that much so different constructs have been assess. Perceived barriers, in one study it was associated when low barriers exist then the consumption is higher. And the subjective norms, the perception of other's attitude on our own diet is associated positively with a higher consumption of F&V. If we look into other domains like family related factors, it seems like when the family eats more F&V, the variety, the home availability and access so parents acting as models have a positive influence on what children eat. Family structure, it seems like 2 parental families have positive influence on consumption compared to other family models while there is no conclusions regarding family sizes. The frequency of family meals also has a positive influence so the families who eat more often together the main meal at home or outside home but they eat together more frequently, this has also a positive influence on the amount of F&V children eat. Regarding the influence of friends, the perceived friend intake so when children perceived the colleagues, their friends eat more F&V then they also tend to eat more F&V and that is the positive association that has been observe at least in the studies showing that. School-related factors and particularly about the availability of F&V has a positive influence either on the school meals basis or other F&V schemes. So as long as F&V are more available and accessible in the school then children tend to consume and eat more F&V. On the other hand when competing foods exist in the schools either by means of the kind of food offer served in the schools meals, in the canteen or by vending machines or any other means then this has a counteracting, a negative influence on the amount of F&V children have. According to this review, the longer hour the TV exposure, there was a negative association with F&V consumption.

However, as I said previously, in the Pro Children study we conducted this literature review but we also investigated by means of qualitative methods determinant factors of F&V consumption and we concluded similar results. Personal Factors like taste preferences, knowledge, awareness were really relevant factors and the Family Environment mainly the availability and access, modelling by parents, have an important influence as well as to School F&V availability, schools norms and peer influences.

But, we also by means of a questionnaire investigated the influence of the different factors and I want to show you results from the analysis of the exposure to TV watching and the relationship with F&V consumption in the Pro Children study. You can see how TV viewing is really different matter and the Southern European countries like Spain and Portugal more often watch TV during dinner and are more often exposed to TV.

The proportion of children reporting having seen TV ads during the previous month and the kind of food items and beverages that they were exposed to by means of advertising and publicity, here I would like to highlight that if you look at the number of adverts regarding F&V children were exposed to is approximately half the number of the kind of adverts they were exposed related to candies, soft drinks or other matters.

However, in this Prochildren study we could see a positive association between exposure to F&V TV ads of children and a higher consumption. It was an immediate effect where exposure to TV ads on F&V positively influence attitude towards F&V and produce a higher liking for F&V and that was the mediating model on how this influence the amount reported of F&V consumed. However other studies have shown that longer TV exposure and longer exposure to TV ads in general, not specifically to F&V TV ads that we showed in the Pro Children study, has a negative effect on F&V consumption.

So we can say that the evidence existing related to F&V consumption is solid fully age, gender, socioeconomic level, preferences, self-efficacy, knowledge, family consumption and modelling, availability and access at home, habit strength. Regarding parenting styles this is not so conclusive as it has been less investigated and apparently there is a positive effect of the kind of authoritative feeding that is when norms and rules are established at home but at the same time some kind of encouragement and support for the children that seems to be positively associated with a higher consumption of F&V while, a negative association for a more authoritarian kind of feeding where only norms with no support or encouragement is exposed at home. More recent research is focusing on the availability and access of F&V in neighbourhoods still little research has been published but it is interesting as it more focusing being place into that and it seems like small neighbourhood food stores and their fresh produce availability and good local availability, own vegetable garden, may have a positive influence particularly on low food insecurity.

To end the presentation, I would like to highlight that this investigation of the determinants of F&V consumption is important firstly to understand why the situation is like it is but specifically because we have evidence that F&V consumption particularly among children and young people is below desire levels and action is needed. Some kind of interventions is needed to be divided in order to tailor to the needs and to cultural factors and to design more effective intervention we need certainly to understand that. In the Pro Children program, in the intervention that we

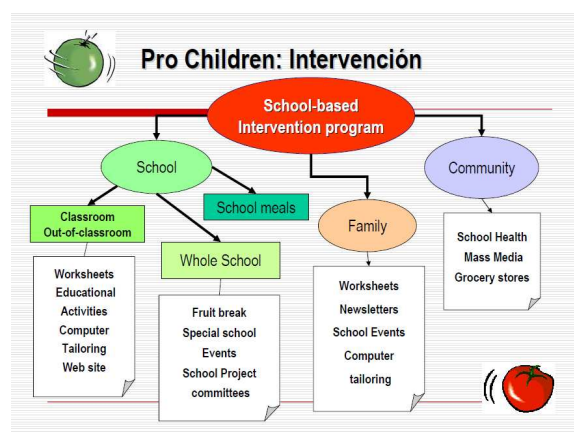
Identified changeable important determinants of fruit and vegetable consumption in Pro Children intervention

Determinants		
Personal	Social	Environmental
Awareness of importance of fruit and vegetable intake for health and well-being	Parental facilitation and direct encouragement	Availability and accessibility of fruit and vegetable at home
Positive taste preferences for different fruits and vegetables	Parental modelling behaviour	Availability and accessibility of fruit and vegetable in the school
Awareness of own fruit and vegetable intake	Peer modelling behaviour	A fruit and vegetable promotion school environment
Awareness of recommended intake levels	Teacher support	Neighbourhood support
Self-efficacy and skills for asking for fruit and vegetable		
Self-efficacy and skills for preparing fruit and vegetable		
Self-efficacy and skills for obtaining fruit and vegetable		
Self-efficacy and skills for keeping fruit and vegetable fresh		
Familiarity with different fruits and vegetables		

Pérez Rodrigo et al, Ann Nutr Metab 2005;49:267-277

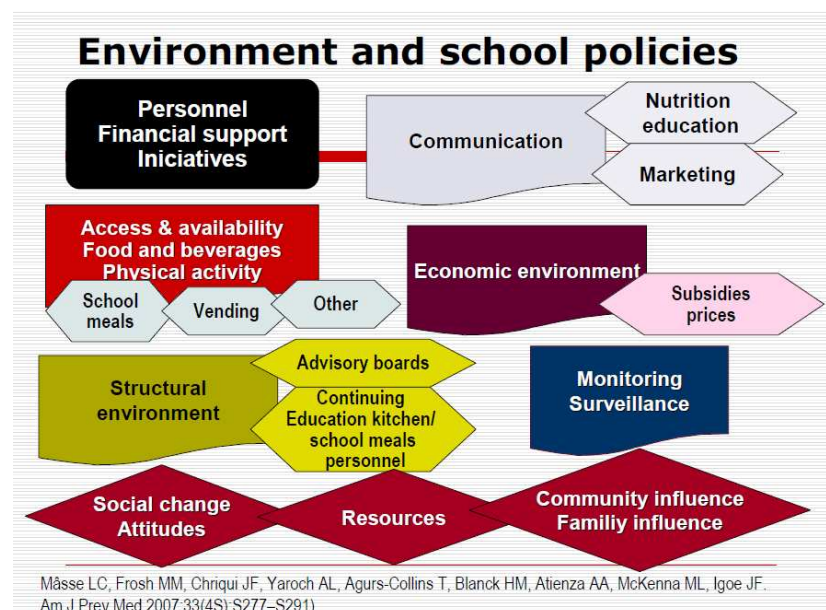


tested we followed an intervention model procedure and that is we tried to understand the determinants that were relevant for the kids we were working with and try to look into those determinants which were able to be change within the time framework that we had that was 2 school years. According to those that we selected summarized in this table are the personal, social and environmental domains we tried to design the learning objectives that could be achieved to the program and try to identify which were the best teaching tools in the educational methods that could better suit to achieve the objective. So, this is just a flavour of the complex matrix that we came out with looking at the different determinant domains on the kind of learning objectives that we have divided and which are the most appropriate methods that should be used.



Therefore we ended up with a complex set for the intervention divided into three different blocks namely the school area, the school component looking into class rooms and out of the class room activities as well as whole school issues including school meals where they were existing, a family component and a community component.

In fact the school setting provides a wonderful opportunity for interventions if we have groups of children families and teacher together, all children attend school although all have the rights we must be aware that not 100% of children attend everyday regular school but most children attend to school. They spend many hours everyday, at least 5 days/week for 9 months/year and this for many years so this is a lot of potential. Additionally there is a potential for environmental intervention by means of school meals, vending opportunity, physical activity and also to influence the family environment. So there are different options including food planning and preparation development skills, school gardens and F&V schemes are other opportunities. But, the key thing is that interventions to be effective it is not just on a short term of a pilot testing that it should be desirable that when interventions work they could be sustainable in a long run. So a number of features should be focused in terms of school and environmental school food policies.



So unless there is an appropriate infrastructure and adequate budgeting and adequate resources this can not be effective in the long term and this is the big challenge that we need to face.

C ROWLEY (President of the session): The thing that strikes me with all the interventions that are out there is that it seems that the more we know, the more we really need to know and we need to keep out these things and look what these determinants are.

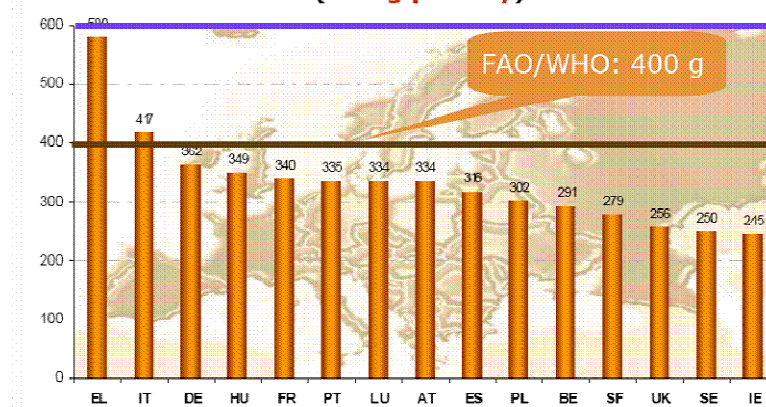
School fruit and vegetable schemes: an international review of effectiveness

Karen LOCK

London School of Hygiene and Tropical Medicine, UK

I want to talk to you about a systematic literature review that myself and colleague Joia de Sa at the London School of Hygiene and Tropical Medicine did last autumn. And we did it specifically to fit in the EU school F&V scheme impact assessment process. Obviously it is important at any point to have various pieces of information when you are planning policy and only one piece of that is scientific information on the effectiveness of such schemes. We were pleased that we were able to help and we felt that the important questions for us to answer were: Do school F&V schemes improve childhood nutrition and health? How are they organised? And how can we identify any necessary factors for success? I will show you how we were able to answer some of these questions.

Consumption of F&V (g/day per capita). Strong difference between Member States. Under the level recommended by the WHO and the FAO (400 g per day)



Source: DAFNE Data Food Networking 2006 – DG SANCO

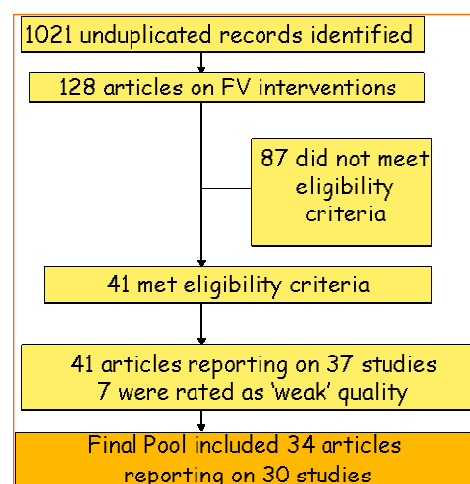
To the question why increase FV intake via schools I think it is obvious, there are poor F&V intake in children, we had some associations from recent cohort followed up in the UK that there is an association with higher childhood F&V intake and low risk of adult stroke in cancer as well as adult link with low intake and higher risk of diseases and schools

are the obvious setting to target children.

This graph shows the consumption of F&V in Europe in adults and we saw information showing that we know in Europe that it is below the recommended levels.

The current systematic literature review that I am going to be presenting the evidence from, as I said we started looking at studies that were published or that we could retrieve to August 2007. We looked at studies looking at nutrition or food interventions that incorporated fruit and vegetables and that had to be a core component of them, in any children under 18 years in school or pre-school settings. They had measure FV intake but we did look at secondary outcomes including attitude and knowledge to FV. We basically looked at only those with an experimental or quasi-experimental design i.e. they had to have a control group so

we could be clear that the impact of any intervention was due to only those in the interventions group. I am not saying that is the only model of how you should evaluate a School Fruit Scheme depending on your requirements and there have been plenty of schemes that we did not wish to include in our review including the New Zealand one that is an excellent scheme and has been very well evaluated but because we set this sort of scientific criteria material for the evaluation of a control group we had to not include them. So just because they are not include is does not means these School Fruit schemes are not well evaluated but we just wanted to make sure that the absolute results we can be certain of in terms of improve the intake were due to interventions. The picture is just a summary that we managed to find over a thousand records which eventually were when we sort of filter them down were 128 articles on F&V, 87 did not this eligibility criteria, some I just mentioned. And eventually we rejected another 7 papers because they were rated 'weak' in terms of scientific quality (...). So the Final Pool we looked at was 34 articles with reporting on 30 studies and I am pleased to certify that on the panel today we have got lots of experts that did these studies so they can give you much more details on some of the schemes. I think that if you have to retain one thing of this paragraph, all we need to know is that school based F&V schemes are effective and increasing intake and that is one message that is pretty straight forward. Of 22 studies, over 70% showed statistically significant increases in intake and that was in all age groups. No studies showed reduction in intake which is also a very important finding. As far as I am concerned you can not do any harm in terms of F&V intake. We did not bother to do what in scientific terms is a sort of projectionist approach that sort of work out what is the average intake that all these schemes could do but we can just give you a range. So, they were ranged from 0.3 to 0.99servings/day in terms of the impact they had on children intakes of F&V. That compares well with recent meta-analysis which pooled 7 US studies by Howerton in 2007. They found that between these 7 studies, an increase of 0.45 servings a day as an average were after pooling these 7 studies. The other key point to take away with us is that there is some evidence now that FV interventions in schools can result in long term dietary changes and I think that is important in the fact that they are effective because that is the all point. When we finish the interventions, is that going to be long term impact? That is a key for policy. We know that the consistency studies have followed up of over 2 years. We also hear about the Norwegian school food scheme that had 3 years follow up and is incredibly successful.



In terms of summary of findings they are all in the main report if you go to my webpage. As you see major studies were on younger children surprisingly most 23

AGE of CHILDREN	Younger (5-11)	Older (11-18)
Total number of studies	23	7
<i>Note: numbers of countries in which studies were in younger children >23 as one study was multi-sited (Pro children, te Velde et al).</i>	Ireland (2) Netherlands (3) Norway (1) New Zealand (1) Scotland (1) Spain (1) UK (6) USA (10)	Belgium (1) Norway (2) USA (4)
Number of participants		
<1000	12	3
>1000	11	4
Secondary outcomes		
Anthropometry/Obesity	5	4
Physical activity	5	4
Reduced TV viewing hours	2	1
Micronutrient intake	0	2
Cholesterol	1	0

and only 7 on older children. Again if you look though the list of names, most of them are actually in Europe and US and very few, in fact non from developing countries and that is particularly because of the way the interventions were designed, it is not that we did not find any. There were some gardening interventions from other countries, not in Europe and the US. Some of

them had very big studies, 11 on younger children were over a thousand participants so it is good evidence as well. You can actually see that a lot of them looked at secondary outcomes including impact on overweight and obesity, physical activity, TV viewing hours etc.



What we found is that School F&V schemes are incredibly diverse. The interventions that have been planned or the national programs that have been ruled out vary considerably. The picture in black and white is actually one I found of UK cooking class where they were told to prepare vegetables in schools for the girls in 1917 so we are not actually novel in this. It has been 90 years in the planning.

But what we can tell if we look at the interventions is that there is a huge range of types of interventions between young and old. A lot of them unsurprisingly had 7 interventions among the younger providing F&V either free or subsidised and that included 2 national schemes, the UK and the Norwegian schemes. Because most of them had actually been planned from Public Health departments, a lot of them had classroom based curriculum or education components both in young and old age groups. But the nice thing is that a lot of them had many components and that includes school wide policies in terms of campaigns, school gardens etc. specifically policies on what you can buy and sell in schools as well as F&V including changes in the school food

Types of interventions

	Younger (5-11)	Older (11-18)
FV provision (free or subsidised) inc 2 national evaluated programmes	7	3
Classroom based e.g. •Curriculum/ education •tasting •prizes/rewards	17	7
School wide e.g. •school media campaign •school garden •school nutrition policy	13	5
Teacher training	6	3
School food service •staff training •lunch modification •verbal encouragement	8	4
Peer leaders	2	1
Parents involvement	11	3

service and teacher training. And there are numbers that involved peers or parents as well.

Just to summarize in very brief overview of the interventions on Younger children and we randomly chose 5 to 11 years old as meeting most of the school designs around the world for younger children, 16 on 23 led to sustained increased intake in that group. A lot of them did provide F&V and that seems to be important for young but also for older children. Tasting was important and all had some education e.g. classroom activities or something to increase motivation and knowledge in that age group. Some used psychological rewards and models and one of the best known is the 'Food Dude'. So there were different ways they involved the multi components interventions.

In terms of older children the key finding and I think that goes against what a lot of people are saying is actually that you can make an impact on older children. Even if the teenagers' intake of F&V decrease dramatically in many countries, 70% of studies that were done on older children were effective. Most countries are focusing on the younger age groups but I think we should not ignore the older age groups, you can make a difference and that is an important age group. There are a lot of tacking studies that show what you are eating in this period tracks through in terms of healthy eating into your adulthood. So I think it is an important age group not to ignore. They also looked at secondary health benefits, several studies showed reduction in junk food intake which as well increase F&V intake. On the 4 studies looking at obesity out of the 10 lot, only one on older children was really done with sufficient power and over sufficient length for time to show any change and that was the only study that showed reduced overweight as well as increased F&V intake. I do not think that is because F&V schemes are unnecessarily important of reducing overweight and obesity, I just do not think they bring adequate designs to show that yet. There were more focused on health education in the older age group and less focusing on the reward and marketing and that is unsurprising peer issues and parents.

There are two points I want to raise. One important in planning schemes in terms of school F&V availability as shown in terms of determinant of intake is important in changing both the food environment and the diet. As I said there was a provision of free or subsidises F&V in 10 studies. In other studies, availability and access or exposure were actually increased in a number of ways and that is tasting (through the Food Dudes in Ireland), school gardening schemes, cooking, school food service modification, environmental modification as what was in vending machines and, changes in what children can bring to schools in their pack lunches and very other ways as well of changing the availability and accessibility of F&V.

To come back on this word 'multi-component interventions', it is a dreadful word concocted by scientists to summarize the fact that often health promotions or interventions in public health, they try to regroup things all together because it is

logical. We know about the determinants, it is important to change environment, it is important to change knowledge, to motivate in different ways. So you obviously got to tackle attitudes in a multiple approach and we defined as having 2 or 3 (or more) program elements in a program. 75 % of the studies that we looked at had multiple components and these have been shown in other studies, previous reviews of F&V interventions not just in schools and reviews of obesity interventions to be probably the most effective approach to both of them tackling overweight and increase F&V consumption. Unsurprisingly, as well as F&V, education was the majority of this sort of this extra component delivered in the studies, 6 on 7 studies on older children and 17 of 23 in the younger.

Everyone always says, usually the scientists, what is the important bit of the multi-component interventions? Can we not just find out what is the best bit of the multiple component and we do that bit? Obviously is actually quite hard to distinguish the effectiveness of different parts of the interventions and only one randomised control trial TEENS study in the USA in older children explicitly studied the impact of different levels of exposure to a multi-component intervention. Each groups sort of have a add on, one started we just environmental modifications then it added on some education then it added on both of those plus having some peer role models. The first two quite interestingly against the control group showed the school environment and plus the education showed no impact but if you added in peers, peer trained, peer leaders to support it as well it showed a significant increase. Unfortunately this was not sustained at 2 year follow up but it is a way of actually looking at components and how maybe the additive effect is very important.

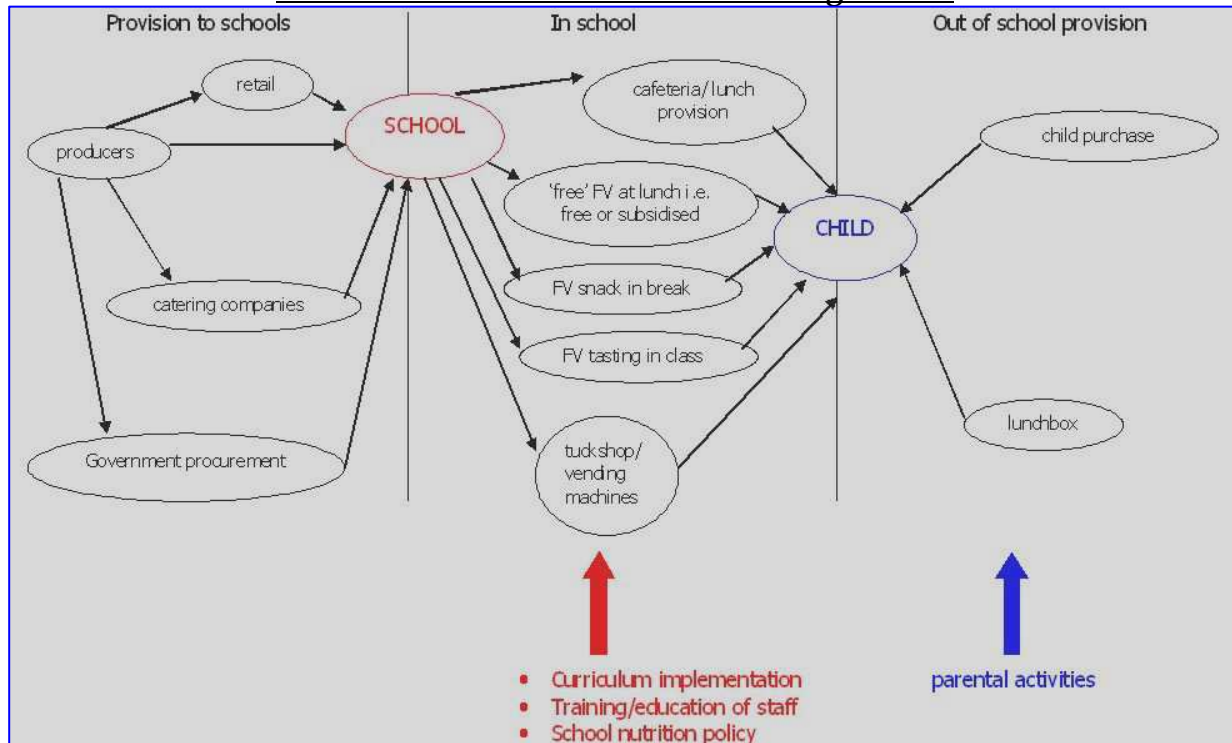
To summarize that part, school F&V schemes clearly childhood nutrition and health. But I think the important thing is that they can also potentially provide other social benefits and specifically reducing social and health inequalities.

As we know children from low socio-economic groups traditionally have lower FV intake. The Norwegian School fruit scheme study is the only one that explicitly looked at the differences groups of different SES and showed that a free-scheme is clearly the way forward to reducing health inequalities in terms of intake of F&V. In terms of the discussions around food prices and how this is going to impact on everything I think actually free school fruit schemes are important mechanism to ensure diet quality and food security of these low income groups. Rather than thinking we are going to loose the battle because of this, I think probably it is an important mechanism.

Finally, how the School F&V schemes have been organised? In terms of how they have been organised, this is just a summary slide.

Field to school 'fork':

How have school FV schemes been organised?



We tried to look at field to what I call the school 'fork'. On one side is the provision to schools and this came in a number of different ways. Producers might supply retailers that supply schools, producers might supply schools directly or producers might supply the catering companies that provide school meals and producers supply the government procurement. So there were complicated ways of just getting the F&V to schools. Once you are in schools, the numbers of schemes have different ways of getting the F&V from one it has been delivered to the children's mouth both in terms of café and lunch provision, free provision, snack programs, tasting in class, vending machines, tuck shops that I said was influenced again down there by the education and curriculum component to try to stimulate it and school nutrition policies. Then in terms of child, there were out of school provisions both in terms of child purchase and also lunch box because like in the Food Dudes school scheme in Ireland that is about what children bring in for their school lunches because the reality is there are lots of different lunch provisions in schools across Europe.

To summarise, what factors affect delivery and impact? Clearly the supply chain is what every school in a F&V scheme has thought about when we starting up new school fruit schemes in the EU for new member states these are the things we need to consider and analyse, what are the key point in each member states. In terms of the supply chain who is the purchaser? Is it the school or is it the government? Are we going to get the supply direct from wholesalers/producers/retailers or via government procurement? There are completely differences in school systems around the world, both in terms of school meal provision and school food policies on what junk food can we have in schools, if you can have vending machines, whether

children bring pack lunches. This is quite important because there are a number of studies and I know they had to deal with this in the Pro Children study and had a model across multiple countries, some of them had school lunch programs and some did not. In Ireland, the Food Dudes schemes had to work with the school food system that does not have a school lunch program where children actually bring their lunch in whereas in England, we have a school lunch program. So, you obviously got to design the system completely differently depending on that. Free versus paid, snack versus meal are different ways you can give kids the F&V. Target groups, a lot of people because of logistics and finance go for selected age groups, why not all years? How often do you give it, everyday, some days, short period of time? Ideally everyone would like to continue and make this sustainable like the EU proposals. And what partnerships have you got? The has been key, the English scheme had trouble to start with because it did not make the right partnerships work and it had to set up a new supply chain from scratch after sort of ignored the agricultural sector. It is important to get the partnerships right. On the strength of current evaluations, there is no single best approach to all those and it clearly has to be flexible and adaptable to the context of country and to the diet school food system and also the supply chain system.

The last mention that we had to do is we looked at cost-effectiveness. Only one study looked at cost-effectiveness and it is an economic modelling study from Norwegian Directorate of Health. It shows some evidence that actually even a small very minus increase life long of 2.5g/day over the lifetime of F&V consumption is significantly cost-effective and makes a very large health care savings. Unfortunately it is in Norwegian so I had to get it translated: *'providing a free school fruit programme to all pupils grade 1-10 would be cost-effective if it resulted in a lifelong increase in mean fruit and vegetable consumption of only 2.5g/day'* (Sælensminde, K. *Frukt og grønnsaker i skolen Beregning av samfunnsøkonomisk lønnsomhet*. Oslo: Sosial-og helsedirektoratet; 2006.)

The important question are do school fruit and vegetable schemes improve childhood nutrition and health? The answer is yes. We also looked at the importance at how they are organised and what are the necessary factors for success. We know in the EU school fruit measure could increase added value by increasing availability particularly around the low consumers, reducing social inequalities as long as it is flexible. It is ending on good news and we have to congratulate the US Farm Bill for this \$1 billion funding over 10 years for their F&V snack program. And we are hoping that something similar by the end of the year can be announced in Europe.

C ROWLEY (President of the session): We should remember simple things: they are effective, they are no reduction and some evidence of long term change and those are the positive things we need to get out. The other thing is that there are a lot of different ways to get to these results with all the cultural and organisational differences. I am a bit disappointed the trial studies were not included but we forgive you on that one.

New Zealand's Fruit in Schools program, a public/private partnership in action

Paula DUDLEY

'United Fresh/5+ A Day Charitable Trust', Birkenhead, Auckland

I am going to present New Zealand's Fruit in Schools program and I am going to take a practical approach to that, as a case study, hopefully to give you insights of lessons we have learnt and successes we have had since we launched the program in New Zealand (NZ).

As an overview of what I will present I am going to touch on the NZ health policy landscape, the timeline it took to get to our partnership operating, the program design, the numbers that are currently involved at this stage and the possible roll out that might happen by 2009, the Government has funded an evaluation and it is half-way through so I will give you an update on that and finally the benefits of the public/private partnership.

This is the Health Policy Landscape:

- 2000: *New Zealand Health Strategy* that is our overarching strategy and identifies raising the consumption of F&V as a priority (as do all the policies).
- 2002: *National Children's Nutrition Survey* that was a piece of research with over 3000 children involved in NZ that showed that only 40% were eating the recommended 2 servings of fruit a day and 60% were eating 3 serving of vegetables. So the government wanted to act on that as it also showed that 1/3 of our children are overweight or obese.
- 2003: *Health Eating Healthy Action Strategic Framework and Background* released
- 2004: *Healthy Eating Healthy Action Implementation Plan*
- 2006/07: *HEHA implementation and Mission On*
- 2007: *Select Committee Inquiry into Obesity and Type 2 Diabetes* that went on to recommend that the Fruit in Schools program was recommended to every single school in NZ.

For the timeline everything came together as far as the industry wanted to implement a Fruit in Schools program and the Government wanted to address the obesity issue. In 2002 we had an international meeting very similar to this conference which included a workshop on Fruit in Schools and NZ got to learn from countries such as the UK and America who had Fruit in Schools (FIS) programs implemented. Then we came back to our Ministry of Health and proposed a FIS program in 2003 just after the National Children's Nutrition Survey was released proving to be perfect timing for the Government to implement such a scheme. Then we were lucky enough to host the International Fruit and Vegetable Symposium and our Government partnered with us and the WHO, helping credibility, which was great. This is actually where IFAVA was born. In 2004 we piloted the scheme to test the

practicalities of the scheme to make sure that we could get freight to the remote areas and that fruit would stand out of cool storage because it gets very hot in the summer. So we got to roll out from the first phase in 2005 and now, it has not been confirmed but it does look like phase 4 will roll out as well this year so that is all good news for everyone involved.

What did we actually propose to our government? We took a proposal along with all the components in place. We suggested that they fund a piece of fruit or a vegetable. To make that clear, we call the program Fruit in Schools however we actually provide F&V which is great from the industry perspective as well because if you represent industry as I do, they do not want to just be fruit, they want it to be F&V. This works out well for health anyway. In NZ schools are rated by decile from decile 1 to decile 10. Decile 1 is the highest deprivation area and this is where we targeted FIS. We gave the government the cost estimate of absolutely everything that we thought might be involved, the fruit, freight, the accountancy, the management, the communication on a day-to-day basis. We actually created a formula we could give to the government to estimate costs. We created a formula that came out with a cost of 37 NZ cents per day per child and that is probably about 0.17€. So, what we were offering was a tangible project that we would run if the government would fund it. It was in line with a number of their health policies.

FIS Partnership Model



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We worked together on a partnership model and we saw there were three components that needed to be addressed. The Ministry of Health would be responsible for funding the program, and the research, evaluation and coordinating the non-government organizations such as the Cancer society and the National Heart Foundation. They would also fund local people on the ground to visit the schools,

called the Health Promoting Schools Coordinators. Then, we saw the need for a management communication component because there were a lot of stakeholders involved and the industry made it quite clear that they did not want the schools ringing the local wholesale supplier with questions. The produce industry was there to supply the fruit and freight and United Fresh provided their umbrella by putting the local producers and the local wholesalers together with health promoting fruit in schools coordinators and the schools on the ground. That has worked very well. Since 1994 we have produced resources promoting good health via 5+ A Day and we now distribute resources to fruit in schools as well.

Regarding the program design, as I said, a steering group was set up with all the stakeholders involved, all the NGOs, the Ministry of Health, and United Fresh as the industry. It was quite clear to everyone that just providing fruit would change the immediate environment but to make sustainable change the program had to go further. So in NZ they decided to report around the Health Promoting Schools framework. The schools focus on four areas: healthy eating, physical activity, Sunsmart and Smokefree. The fruit is not actually the whole program but is the reward for working toward becoming Health Promoting Schools. The schools signed contracts to say that they would work towards this in order to join the program.



Fruit in Schools – Current Numbers

Phase 1: 60 schools 11,500 children

Phase 2: 54 schools 11,000 children

Phase 3: 167 schools 38,000 children

Total: 281 schools 60,500 children

12 million pieces of fruit each year

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This is where we are at the moment with over 60,000 children a day eating F&V. We deliver twice a week which is working well. In some areas where the rolls are really tiny and really remote we might even do a once a week delivery. When FIS was proposed to the industry some were excited, however quite a few of them actually felt that is devaluing the products by giving it away. Those people have done a full

turn around. Twelve million pieces of produce are now being delivered into schools. They now love the program and they see it for what it is, it is marketing for them to attract consumers of tomorrow. The roll-out looks like it would be coming by 2009 and then we will be sending out 100,000 pieces of produce every day. That would include the most deprived schools to decile 2 and that is over 20 million pieces of fruit and vegetables each year.

As I said, the government funded an evaluation. They took baseline data at phase 2 which provides some good results. The evaluation is and will be completed in 2009. They are monitoring the attitude, changes to attitude and behaviours toward healthy eating. The findings so far have included: an increased awareness in the importance of healthy eating, increased knowledge about healthy eating, and more children reporting that they are actually eating more F&V. With the evaluation group, there are 51 schools in total and there are seven control group schools. They have seen a large decrease and positive attitude toward F&V. The report will be available next year and we will ask our government to put it on the IFAVA website so people can share it.

As part of the communication and management component of the program we have a wealth of anecdotal information. We gather information daily as we call the schools everyday to make sure that everything is going well. Dental health is improving, concentration has improved, skin infections have halved, and children are bringing more produce to school in their lunchboxes. Also, toilet paper consumption has increased.

Now to the all important benefits of the program for the three partners: for the Ministry of Health - they have been able to capitalize on the industry's expertise as far as freighting the produce, and selecting appropriate produce. There have been cost benefits because of economies of scale due to using United Fresh as one focal point to the industry rather than the Ministry contracting individual local suppliers. We also have centralized reporting and control so we can keep an eye on the program everyday. The fruit quality management is not as simple as that and we have learnt that. The public/private partnership is also a quantifiable project that government can put toward their health strategies.

The benefits to the industry are that obviously we are seeing consistent rateable business as long as the contracts and the contract run for 3 years. The children are getting exposed to the products. And anecdotally we have seen that children are now asking their parents for these products. We are getting reports back from the schools that these children would not actually bring in F&V to school at all before the intervention. Now they are actually bringing fruit to school as well at getting a piece of fruit at school, we could not ask for better. The "feel good factor" can't be underestimated; the industry just loves it now. They are champions of FIS.

Benefits to United Fresh and the National 5+ A Day Program: the partnership and FIS has huge benefits for us as well. Our credibility is strengthened to the point that about a month ago we went to a research company to ask to do some more

awareness research and some understanding research for 5+ A Day and they looked a bit uncomfortable and said they just done all that for 5+ A Day for another company. This company shared the results and reported that 95% of all NZ are aware of 5+ A Day. As far as the traceability and the accountability for the producers supplying the fruit they all have to become members of United Fresh so that has grown our membership base.

This is a Maori proverb that I think wraps up our School program very nicely that basically means that when you share knowledge we will achieve much more together and in this case it is for the health of NZ children.



Na to rourou
Na taku rourou
Ka ora te manuhiri

*With your basket
And my basket
The visitors will be fed*

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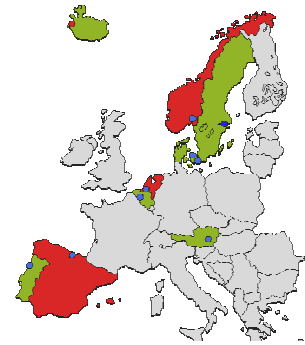
C ROWLEY (President of the session): For me these sorts of things are very exiting to hear how these programs are going throughout the world. When I first started the Go for 2&5 and talking to people about why industry should get involved, how Horticulture Australia should be involved and I remember talking the Agriculture conference and they asked be why industry should get involved? And I said because NZ got one and that was the reason to drive it, if NZ can do it, we needed to be able to do it. Industry needs to be involved.

Results of the Pro Children Study

Saskia Te VELDE

My presentation is about Pro Children study and I would like to acknowledge my co-authors that are Johannes Brug, Marianne Wind, Mona Bjelland, Carmen Perez Rodrigo, Knut-Inge Klepp and the rest of the Pro Children team.

As you all know F&V can have health benefits specially related to metabolic diseases and certain cancers so that is one of the reason to promote F&V intake and that is the reason why we started the Pro Children project in 2002 and finished in 2006. Nine European countries were involved: the northern European countries, some in the middle to southern European countries. Norway, Spain, Iceland, Denmark, Portugal, Austria, the Netherlands, Sweden and Belgium were involved.

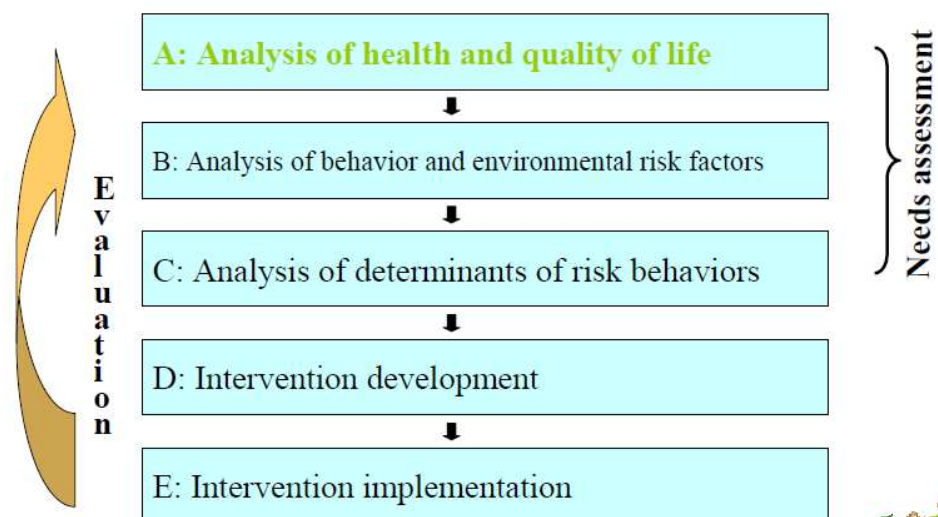


When we started all this we had in mind this simple Model for Planned Health Education & Promotion.

This gives you the steps you have to take design a plan in scientific based health promotion campaign. It starts

with analysing the health and quality of life in the population. We did not actually do it but we know from the literature and from health surveys that most prevalent diseases in the western countries are cardiovascular diseases and cancer and overweight. The next step you have to do is make an analysis of the behaviour and environmental risk factors that are associated with those diseases. Again, from the literature we knew that F&V intake is one of the risk factors that can be associated with increased prevalence of cancers and cardiovascular diseases. Following this model, the Pro Children study consisted of several sub studies. First of all we started by doing review studies.

There was first of all a review on the literature on behaviour change theories that is good to provide a framework and that we could use to design our intervention. The



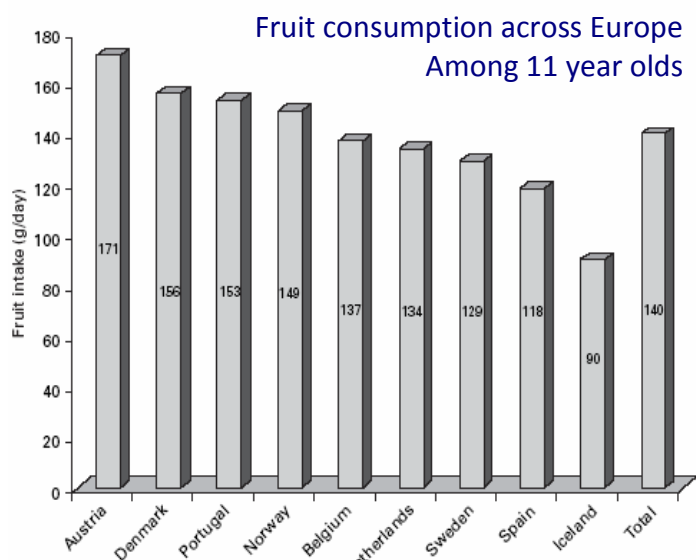
second review was on the determinants and the review on interventions studies that could give us some good strategies. The next step was to develop instruments which could assess F&V intake so we can collect new data. Then we did some qualitative studies and Carmen Perez-Rodrigo presented you the results. We did some focus groups interviews also to get an idea of what the children would tell us about what they think is a main determinant of why they eat or do not eat F&V. And we did some interviews with the teachers, what they thought was good strategy to promote F&V intake. Then we did cross-sectional surveys and I will present some results later on. We did this cross sectional survey in the nine countries and we assessed F&V intake in the children and their parents and we also assessed what the main determinants were. So, the first days of the Pro children study was a cross sectional survey conducted in all 9 countries. We took random sample of primary schools except in Belgium and Austria; it was primary schools from selected areas. We conducted school based surveys so one of the project when we went to the schools or we sent the survey to the schools and children completed the surveys and the supervision of the teacher were one of the project workers. They also had one questionnaire to be completed by one of the parents that was most often the mother. The questionnaire consisted of a general part asking about age, gender, birth date; parts that was the 24h recall asking about what F&V they ate previously and then a F&V frequency questionnaire assessing their usual F&V intake.

	Countries			Characteristics of the cross-sectional sample						
	All	Austria	Belgium	Denmark	Iceland	Netherlands	Norway	Portugal	Spain	Sweden
Sample size	13,305	1,692	1,343	1,919	1,196	1,105	1,196	2,134	1,313	1,407
Boys	6,680 (50.2)	805 (47.6)	728 (54.2)	978 (51.0)	629 (52.6)	511 (46.2)	607 (50.8)	1,012 (47.4)	705 (53.7)	705 (50.1)
Age (mean \pm SD), years	11.4 \pm 0.48	11.0 \pm 0.59	11.5 \pm 0.46	11.4 \pm 0.38	11.3 \pm 0.33	11.7 \pm 0.46	11.3 \pm 0.30	11.5 \pm 0.45	11.4 \pm 0.44	1.4 \pm 0.47
Age range	8.8–13.8	8.8–13.5	10.3–13.8	9.5–13.2	9.8–12.1	10.3–13.6	10.4–13.4	10.8–12.8	9.8–13.8	9.8–13.6
Number of classes/ schools	723 classes/ 375 schools	73 classes/ 23 schools	73 classes/ 50 schools	105 classes/ 59 schools	68 classes/ 32 schools	62 classes/ 49 schools	73 classes/ 52 schools	128 classes/ 27 schools	64 classes/ 37 schools	77 classes/ 46 schools
Response rate	90.4%	95.3%	84.5%	92.0%	88.7%	79.7%	89.5%	98.4%	94.7%	84.2%

Note that response rate is the number of students' questionnaires returned, in relation to total number of students in participating classes. Thus, attrition consists of students being absent on the day the survey was carried out, as well as students present but denying to participate, or not being allowed to participate by their parents. Figures in parentheses indicate percentages.

Some characteristics of the cross-sectional sample, to show you the sample size, at the beginning we had a large amount of children taking part in the study, a bit more than 13 thousand and it varies between about 1,100 to more than 2,000 in Portugal. As you can see the mean age was around 11 years old, you can also see the number of classes and the response rates which are quite good.

These are the results which show the mean fruit consumption among 11 year olds and you can see the highest consumption was reported by Austrian children and the lowest consumption was reported by children from Iceland which was not very surprising because there are not so many F&V available in Iceland. On average the children consumed about 140 grams of fruit which is below the recommendations.



Yngve et al. Ann Nutr Metab. 2005

Table 5. Percentage of 11-year-old children with fruit plus vegetable intake ≥ 400 g, by gender and country

Country	Total		Girls		Boys	
	n	%	n	%	n	%
Austria	400	24.1	212	24.3	188	23.9
Belgium	253	19.1	108	17.8	145	20.3
Denmark	394	21.2	218	23.7	176	18.7
Iceland	92	7.8	36	6.4	56	9.1
Netherlands	130	11.9	77	13.1	53	10.5
Norway	202	17.5	109	19.2	93	15.8
Portugal	453	21.4	227	20.4	226	22.5
Spain	125	9.7	45	7.5	80	11.6
Sweden	250	18.3	136	19.7	114	16.8
Total	2,299	17.6	1,168	17.9	1,131	17.3

Yngve et al, Ann Nutr Metab, 2005

Too many children do not meet the recommendations

Presented in a slightly different way, we calculated how many children met the recommendations given by the World Health Organisation and less than 20%, about 17/18% of the children met the recommendations showing the importance of campaigns promoting F&V intake.

As I said we also assessed what are the most important determinants of F&V intake and this table present results from the low Countries which are the Netherlands and Belgium for fruit intake.

BLOCK OF VARIABLES	Variable	Number of Items	Adjusted R ² = 0.03		Adjusted R ² = 0.16		Adjusted R ² = 0.24		Adjusted R ² = 0.34	
			P		P		P		P	
			Beta	value	Beta	value	Beta	value	Beta	value
DEMOGRAPHICS										
	Country (0 = the Netherlands; 1 = Belgium-Flanders)	1	-.03	.13	-.06	<.01	.03	.16	.05	<.01
	Gender (0 = boys; 1 = girls)	1	.15	.00	.07	.00	.06	.00	.05	<.01
	Age (range: 10.3-13.8)	1	-.01	.66	.00	.94	.00	.94	.01	.60
	Parent's country of origin (0 = both parents born in Belgium/the Netherlands; 1 = at least one parent born in other country than Belgium/the Netherlands)	1	-.09	.00	-.07	.00	-.04	.03	-.04	.02
	Family status (0 = two-parent family; 1 = one-parent family)	1	-.05	.02	-.06	.00	-.04	.03	-.04	<.05
PHYSICAL ENVIRONMENT										
	Availability at Home*	1			.13	.00	.07	.00	.01	.60
	Availability at School*	1			.03	.20	.01	.52	.01	.48
	Bring to School*	1			.31	.00	.24	.00	.16	.00
	Availability at Friends*	1			.05	.01	.00	.95	-.01	.64
SOCIAL ENVIRONMENT										
	Modeling*	3					.21	.00	.14	.00
	Active Encouragement*	2					-.04	.10	-.02	.27
	Parental Facilitation*	1					.08	.00	.04	.03
	Parental Demand*	1					.15	.00	.12	.00
	Parental Allowance*	1					-.01	.57	-.01	.80
PERSONAL										
	Knowledge (0 = does not know recommended intake level; 1 = knows recommended intake level)	1							.17	.00
	Attitude*	2							.01	.60
	General Self-efficacy*	2							.12	.00
	Liking*	2							.18	.00
	Preferences*	12							-.02	.47
	Perceived Barriers*	4							-.07	<.01

*(-2 = fully disagree; +2 = fully agree)

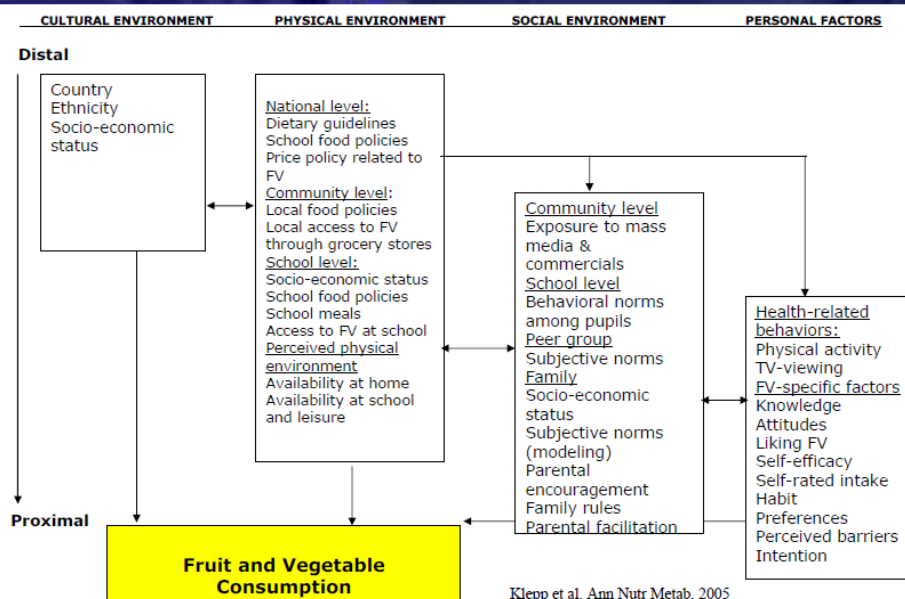
(Wind et al, J Nutr Educ Beh 2006)

(Wind et al, J Nutr Educ Beh 2006).

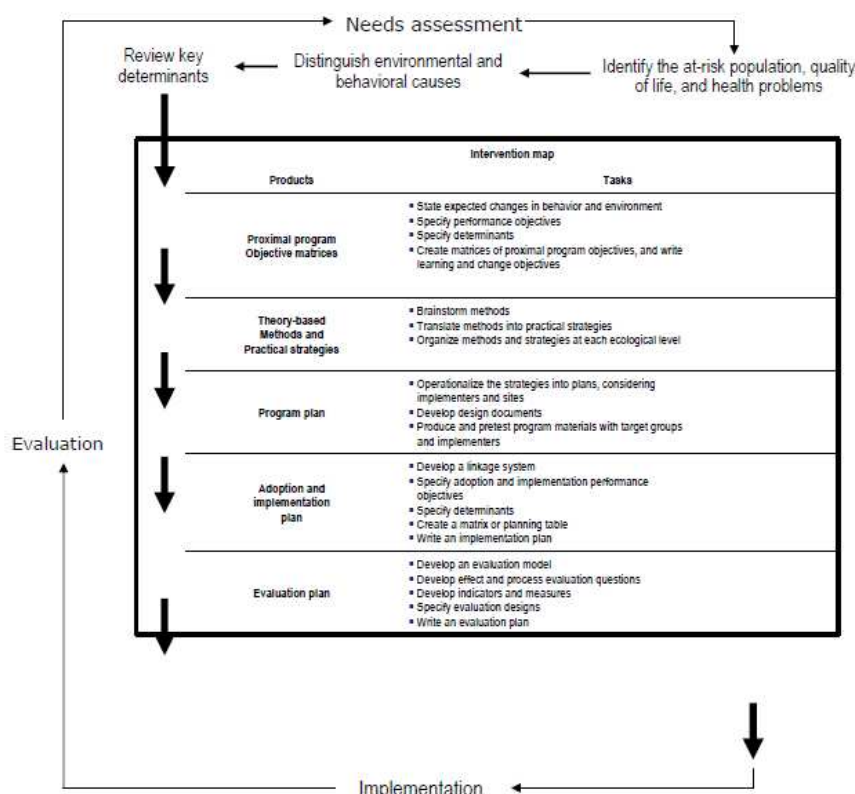
We looked at determinants from different domains. You can find demographic variables, the Physical Environment variables, the Social Environment variables and the Personal variables. The green arrow show significant associations with fruit intake and you can see that variables from the different domains all relate to F&V intake. You can again find gender, age but also bring to school and nearly all social variables so parents are very important and of course knowledge and self-efficacy for fruits. In a table with vegetable intake more or less same variables came out.

This brings us to next step of health promotion which is the intervention development. Coming back to the main aim of the Pro Children study, it was to develop, implement and test evidence and theory-driven strategies to promote the consumption of fruits and vegetables among school children (10-12 year olds) and their parents and we aimed to increase F&V intake by 20%.

Theoretical framework applied to children's fruit and vegetable (FV) consumption: The Pro Children Project



This model guided the development of the intervention and presents all variables that might be or are important according to literature and qualitative researches. You can find the different categories cultural environment, physical environment, social environment and personal factors and you can also see that those variables listed on the left-hand are more distal from the child than the variable on the right-hand side. We used the intervention mapping approach to design the intervention. This approach is described by Bartholomew et al. and results for the Pro Children study are reported by Carmen Perez-Rodrigo. We aimed at improving knowledge of the recommendations, improving better attitudes toward eating F&V, improving self-efficacy by giving them skills to eat F&V and also to improve availability and accessibility both at home and at school. The Pro Children intervention was a multi-component intervention which was explained in the previous presentation. It consisted of the classroom component, school component and the family component. The next graph is the scheme for developing interventions that shows you the different steps. We had to write down the objectives, we selected strategies, how we could aim at improving knowledge etc. and we described the program.



The Intervention Mapping (IM) protocol

Bartholomew K L,
Parcel GS, Kok G,
Gottlieb NH, 2001

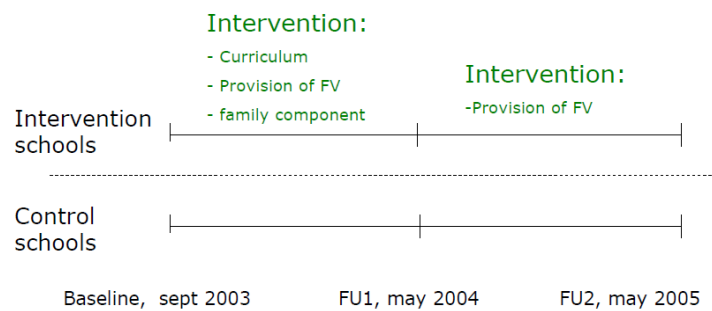


In the classroom component, we used a taste testing to expose the children to various fruits because sometimes they only knew apples and did not know what a mango taste like. There also educational materials as exercises with fruits. The school component consisted of a free provision of F&V during the breaks like a snack. And the family component consisted of various activities; the children brought home some homework assignments that they had to do together with the parents. For instance they had to go to the supermarket or they had to prepare a recipe. There was also a website which the parents could visit and they could do the tailored feed back tool so they could get advice on how to improve their F&V intake. And there were some newsletters that the children brought home which gave the parents all sorts of tools on how they could motivate the children or support the children improving their F&V intake.

Now I will come to the evaluation of the intervention that has been reported in the British Journal of Nutrition. We used the evaluating design that was a cluster randomised control trials meaning that schools were the level of randomisation. The intervention was only implemented in three countries that were Norway, Spain and the Netherlands.

Basically this picture represents the design.

We had two groups, the intervention schools and the control schools and we did an assessment of F&V intake and their determinants before intervention started then we implemented the intervention during one school year so between September and May. Then we did our first follow-up measurement and one year later we did our second follow up measurement. During the second year, there was only free provision of F&V; there were no educational materials and no newsletters. The schools were recruited for participation and after their agreement they were randomised as control and intervention schools. In total, 1,472 children had complete data on all three measurements and we used the 24h recall questionnaire to evaluate the intervention.



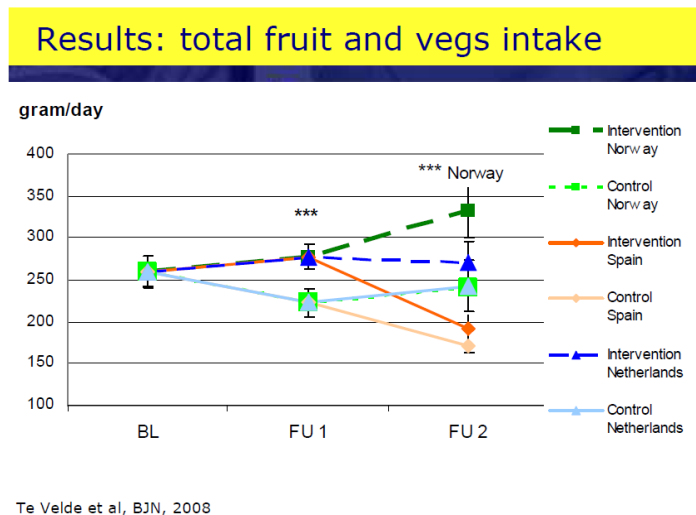
These are some descriptive statistics from the study population. Again you can see that the mean age was about 11 years old, there are slightly more girls than boys and you some data about the family structure and educational background of the parents.

Table 1. Demographic characteristics of the intervention and control group

	Intervention	Control	P
Subjects			
Norway (n)	231	281	
Spain (n)	286	205	
Netherlands (n)	281	188	
Age (years)			
Mean	10.8	10.7	<0.001
sd	0.54	0.54	
Boys (n)	365	333	
Boys (%)	45.7	49.4	0.088
Families (n)	792	669	
Family structure			
Subject lives with both own parents (%)	76.4	77.9	0.271
Subject does not live with both own parents (%)	23.6	22.1	
Subject lives with two adults (%)	85.7	86.8	0.295
Subject lives in single-parent family (%)	14.3	13.2	
Family educational level (n)	701	544	
< 7 years (%)	8.3	8.1	0.918
7-9 years (%)	25.2	17.8	0.002
10-12 years (%)	26.0	31.4	0.036
> 12 years (%)	40.5	42.6	0.452

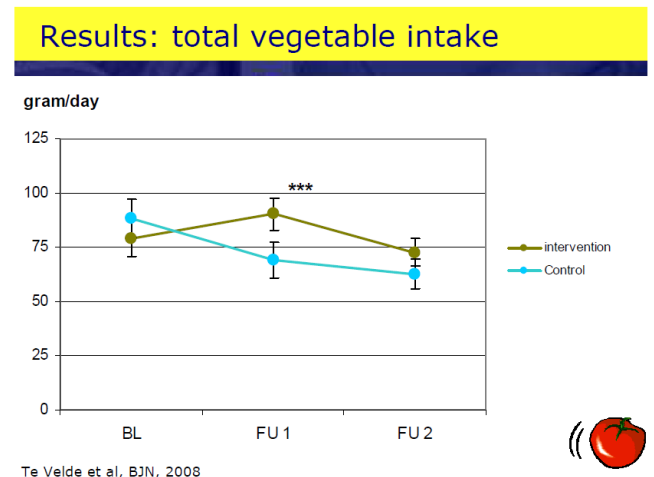
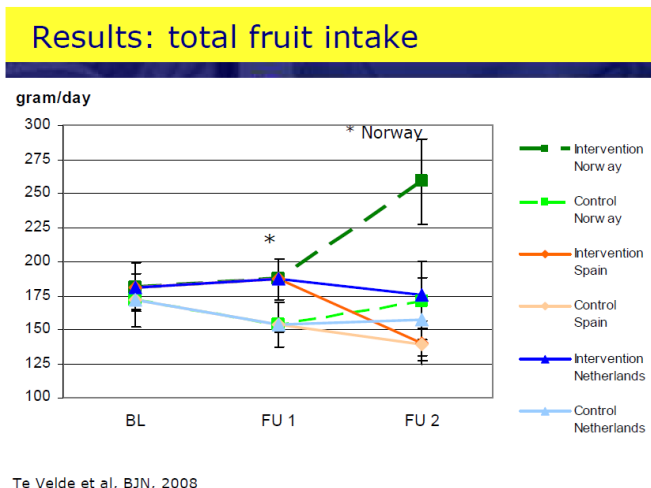
We analysed our data using regression analysis, multiple-level analysis taking into account that the children were clustered within schools.

This graph shows the total F&V intake. You can see the F&V intake in grams per day which is adjusted for age and gender and the axes you see the three measurements: baseline, first follow up and second follow up. The different lines represent the different countries and the different groups. So dark green is the intervention group in Norway, lighter green is the control group. We have dark and light orange for Spain and blue for the Netherlands. As you can see, after one year the intervention groups increase their intake while the controls decrease their intakes and this difference was significant. After another year where children were only provided with free F&V but not with educational materials only the Norwegian children further increased their intake while the other children remained stable or lower their intake. In the second follow up only a difference in Norway between intervention and controls schools was statistically significant. This graph has been made from the results on fruit intake and the results on vegetable intake.



On the total fruit intake results graph, again we can see that only significant differences in all countries at first follow up and at second follow up the Norwegian children increase their fruit intake while the other children from the Netherlands and Spain decrease or more or less stabilised their intake and there was no significant difference at second follow up.

For the vegetable intake there was no different picture between the three countries so these are the three countries together. Again intake is on the y axis and the different measurement on the x axis. You can see a significant difference after one year but this disappear after two years.



We did not only evaluate the intervention regarding the intake but we also wanted to know how well the program was implemented in order to explain our findings. So we asked teachers to complete logbooks and other questionnaires and we scored the teacher implementation of the school curriculum. The score could range between 0 and 16 which is actually the number of lessons that could be implemented. We also asked the parents about their involvement in the program with a score between 0 and 7 which is the number of activities that were organised. We asked them about homework assignments and the newsletters. We asked them if they visited the website and did computer tailoring and we asked them about whether they went to parental meetings or other activities at school. And finally we asked the children how they appreciated the program. There were 9 items questions asking about it.

Here are the results for the different countries on the different process measures. As you can see, in Norway, most curriculum lessons were implemented; almost 9 of the 16 lessons were implemented in Spain and the Netherlands scored worst with only a little bit more than 7 lessons on average implemented and the difference between the countries was significant. Regarding the parental involvement, Spain and Norway scored best significantly better than the Netherlands with more parents involved in the activities. And, regarding the child appreciation we can see that the average scores are closed to 3 so meaning that the children appreciated the project very much, they liked the various activities they did in the class room which is a positive thing.

Reported program implementation, parental involvement & student appreciation

- School curriculum implementation (0-16):
 - Norway: 10.9 p< .001
 - Spain: 9.4
 - The Netherlands: 7.4
- Parental involvement (0-7):
 - Norway 3.4 p= .002
 - Spain 3.5
 - The Netherlands 2.8
- Child appreciation (0-3):
 - Norway: 2.4 p< .001
 - Spain: 2.3
 - The Netherlands: 2.2

Wind et al, HER 2008

I come to some conclusions, first regarding the implementation. We did some analysis relating the rate of implementation to the change in F&V intake in the children and we found that the schools or the countries where the project was best implemented, the most changes were achieved in the F&V intake. Also among the parents we found that when parents where more involved in the studies, they increase most their own F&V intake. However, we also saw that the implementation was rather low especially in my country the Netherlands. I think we found some good results after one year but not after two years. The rate of implementation might be one of the explanations especially because we saw that results were best in Norway where I think the program was best implemented as they had a special teacher which can devote all his/her time to the project while in the two other

countries teachers had to do this as an extra task. Another thing regarding the parental involvement, it is very important to get the parents involved because they act as role models and we also saw in the previous presentations that parents are important and the parental variables are important in the determinants. They can play a role model, they can support their children, and they make F&V available in homes and make them accessible. My final conclusion can be that because we did not find a sustained effect, it can be results of not that good implementation. Regarding vegetable intake it might be that the home environment important for the vegetable intake. At the schools the children were provided mostly with fruit and not as much vegetables.

Free school fruit might give long term effects – Results from the Norwegian intervention study FVMM

Elling BERE

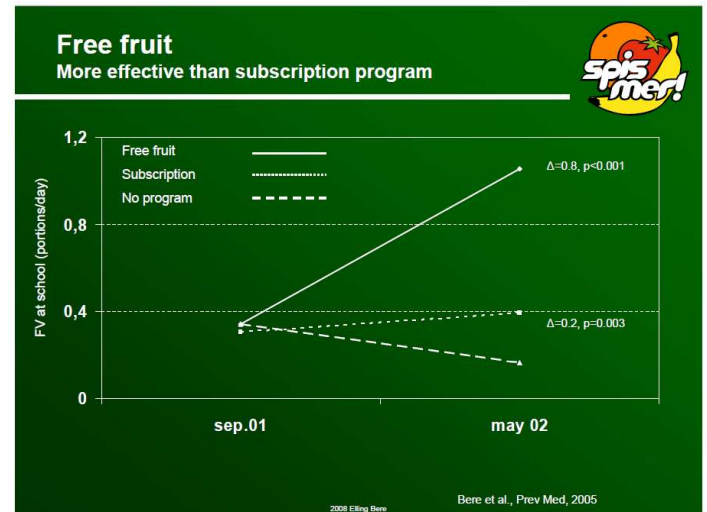
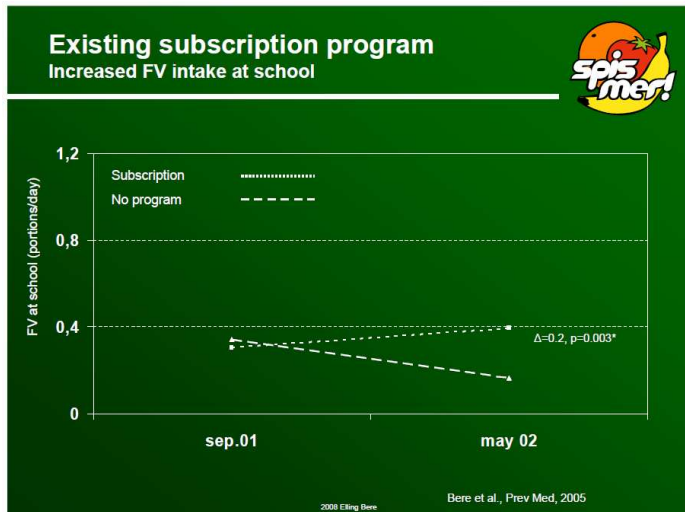
University of Agder, Faculty of Health and Sport, Norway

This project is a research project, it is a Norwegian project. The reasons this project was applied for using kind of the same of the Pro Children. While the Pro Children was applied with EU money at the same time the project was in NOK but Oslo applied also for money in Norwegian Research Council. We started this program a bit earlier then the Pro Children project but the methodology and the design of the study is rather similar to Pro Children but what I will focus on in the presentation it the effect of the Norwegian School Fruit program that we had evaluated and also the effects on this program with fruits provided for free.

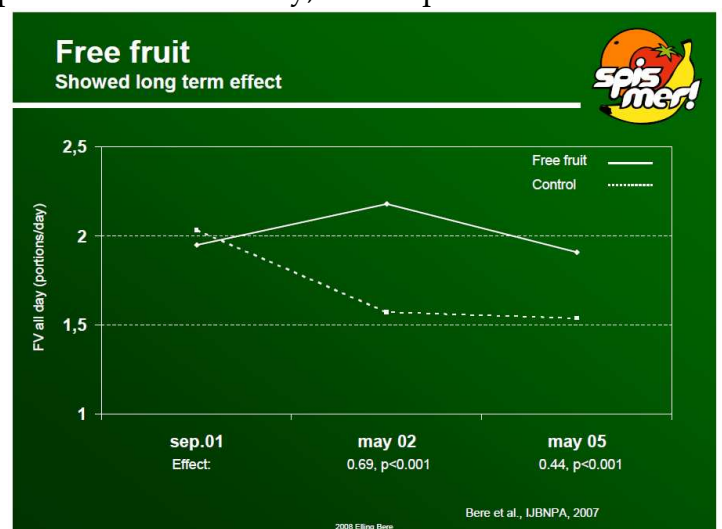
There is an existing School Fruit Program in Norway, it is a subscription program offered to all Norwegian elementary schools. Since it is a subscription program it has a cost, parents or the children, probably the parents have to pay NOK 2.50 a day which is approximately 0.30€. The program is also subsidised by the Norwegian Government and that is an important thing you should keep in mind, for those pupils who do subscribe they get NOK 1.00 per pupil per day. It happens like this: we pupils go to get the fruits, most of the time the fruit mostly provided is apples and they eat it during lunch or after the lunch. We included 38 schools randomly chosen in 2 different counties and almost 2,000 pupils participated in the project. The intervention for this project lasted for 1 year. We were able to give free fruits to 9 of the 38 schools so all the pupils at those schools were able to participate in this program for free. And of course when you offer something for free people do not say no so all the pupils wanted to participate. Then the remaining 29 schools had to choose to subscribe or participate to the normal existing program and 9 schools did and the remaining 20 schools did not participated in this program during the school year. The fruit was not provided before October so we collected the data in September 2001 before the program started and then again we collected data in May 2002 when the program was running so at the time they got the fruit at school and then again in May 2005 so that is three years after the end of the intervention.

I will present basic points based from the results of this project. The first point is that providing free fruit was much more effective in increasing children's fruit and vegetable intake than the existing subscription program. The reason why the subscription program is not effective is first of all because few schools want to participate. Less than half (41%) of the schools in Norway participated in this program. The second reason is that at participating schools few students want to subscribe. In total and this is number from 2006, only 12% of the Norwegian school population from 1st to 10th grades did participate in this program. I think the figures are a bit higher now but not that much. The effect of this existing program is

therefore limited. On the first graph we can see on the white axis that there an increase in intake of F&V at school. And you can see in those schools providing the school fruit program, the pupils increase in average their intake with 0.2 portions due to the school fruit program. It is a significant effect but it is not very large. Then looking at the schools that were provided with free fruit (second graph) the effect is about 0.8 portions compared to schools not participating in the programs. So the effect of free school fruit is of course larger than the subscription program due to the fact that everybody wanted to have free school fruit.



The second point is that we saw long term effects. These pupils given free school fruits for one year eat also more F&V than the controlled pupils three years later. This is a different picture on the last graph as it is F&V all day, still important and the control group is combined from the 20 control schools and also including the 9 schools participating in the existing program because the effect of that program was rather limited. So as you can see there is still an effect three years after they were provided with free fruits. Partly, this can be explained by a higher subscription rate because those schools participating in the School Fruit program for free in 2002, some schools also participated in existing program in 2005 so three years later. Then those pupils who were given free fruits, they participated or subscribed in much higher rate than pupils not given free fruit for a year. So something has happened but this fact does not explain the full difference 2 years later.

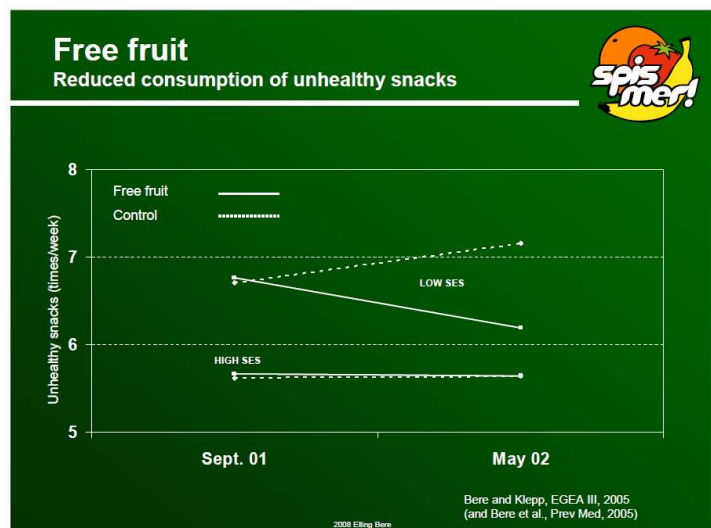


We now get more money so we will do another follow up in 2009 so that will be 7 years after the free school fruit launch to see if there is really effect also when they have finish elementary schools and when there is no subscription program offered. The cost benefit analysis has been conducted by the Health Department in Norway. They want to find out how, what effects free school fruit program would have for 10 years. How large the increase in lifelong F&V intake should be in order to be economically profitable or to at least not cost to the nation? Such analysis is based on assumptions. They have biases but the point here is that the amount of lifelong increase in F&V intake is so small, it is only 2.5 grams, you can almost not measure it on a kitchen weight and certainly we can not measure it using our 24h recall and FFQ. So the amount of lifelong increase is very little. We will continue with this cohort. On the last graph the effect was about 0.4 portions per day in our studies about 80 grams so that would be about 30 grams effect on the free school fruit for one year is about 30 grams when measured 3 years later. So it would be exiting to see how the effect will develop and if there is an effect and that is of course a really important thing to look at.

The third thing is that we also saw that some students reduced their intake of unhealthy snacks when they were given free fruits. We made a scale out of soft drinks including sugar, candy and potato chips.

The interesting thing is that this effect was not for all children but was for those children with parents without high education so it was only among the children with a low socioeconomic status. Those children with low SES eat in average much more unhealthy snacks than the children of parents who have education. So, this is also an interesting effect. We did not see any long term effect of this snacks intake.

Then the social inequalities, because the subscription program, the pupils and the parents had to choose to subscribe or not to subscribe.



Subscription program

Subscribers are different

	Non-subscribers	Subscribers	p-value
Gender (female)	46%	59%	0.05
Education plans (plans of college/university edu.)	49%	68%	0.001
BMI (mean)	21.3	20.5	0.05
FV all day (portions/day, 24-h recall)	1.9	3.2	<0.001
Soda/candy/chips (times/week)	6.9	5.2	0.002
Ate breakfast 'yesterday'	75%	92%	<0.001

Bere and Klepp, in: Ethics and the politics of food, 2006; (and Bere et al., Prev Med, 2005)

2008 Eiling Bere

There is a very clear difference between those who subscribed and those who did not. Girls subscribed in higher degree, those with education plans subscribed in higher degree. The subscribers have a lower BMI, they eat more F&V before the project starts, they eat less unhealthy snacks and have a more regular meal pattern.

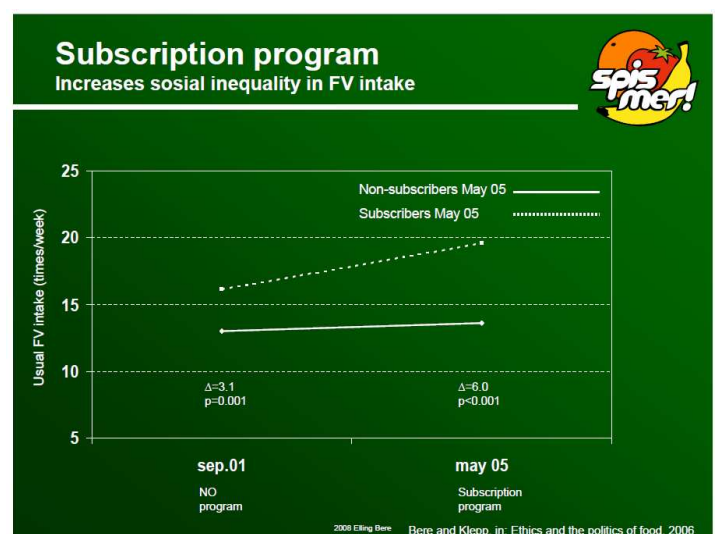
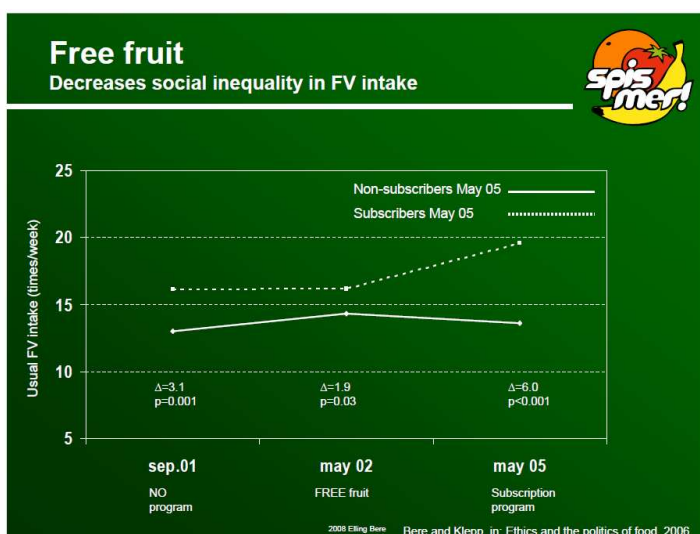
It is not only the children, it also the parents. Subscriber parents are older than non

Subscription program Subscribers' parents are different			
	Non-subscribers' parents	Subscribers' parents	p-value
Age (years)	39.9	42.0	0.002
Household income (in upper half)	47%	65%	0.02
FV all day (portions/day, 24-h recall)	2.6	3.3	0.009
TV watching (hours/day)	1.7	1.2	0.006
Smokers	38%	23%	0.03

Bere and Klepp, in: Ethics and the politics of food, 2006;
(and Bere et al., Prev Med, 2005)

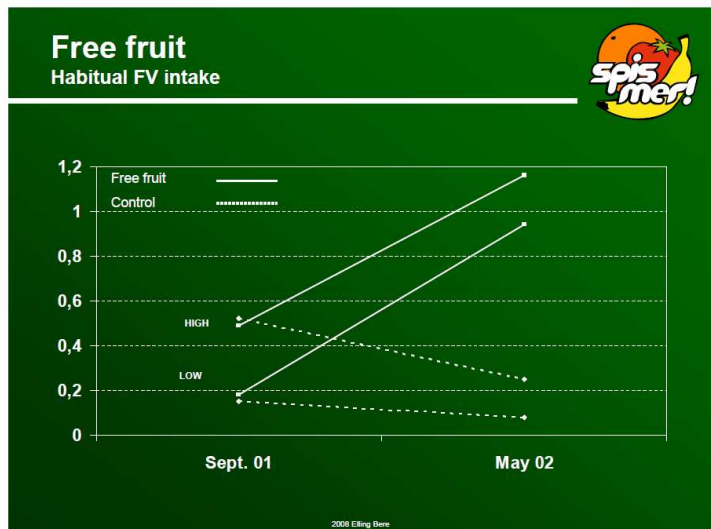
subscribing parents, they are richer they eat more F&V, they watch less television and fewer of them smoke. So there is a clearly different group that subscribed and those are healthier. Therefore the subscription program works among those that do not really need this. The people we really want to reach are the ones that do not subscribe in that program.

Presented in a slightly different way, this is a sub sample of the school cohort I will tell you later why I chose this sub sample but the point is that we have divided them among subscribers and non subscribers in 2005. There is a large difference in F&V intake in 2005 between the subscribers and the non subscribers. This is again a different scale as it is based on fruit frequency measures. What you can also see is that those two groups are also different in September 2001 that is 2 and a half year earlier. What is interesting here is that these pupils also participated in the school fruit for free in 2002 and when you see what happened when they participated for free was that the difference between the subscribers and non subscribers in 2005 was smaller than it was initially in 2001.



So this indicates how a free program works on the different groups and how it is compared to the subscription program. A free program tends to reduce the effect while subscription program increase the effect in social inequalities in F&V intake.

When we measured the effect of the intervention we checked to interaction with social status, gender, and so on in order to see a statistically different effect in the different groups. We had not seen any such effect except for the one I told you about, the unhealthy snacks. So with the graphs I have stratified on usual F&V intake and you see those with a low intake and those with high baseline intake there is a huge difference in F&V intake at schools before the program starts. There is also a difference while the program is running but both groups increase their intakes. The important thing is that those that are eating little F&V are also increasing their intake substantial and those are the ones we really want to reach.



In conclusion, Free School Fruit is more effective than the existing subscription program. Free school fruit show long-term effects. Free school fruit decrease consumption of unhealthy snacks at least in a part of the cohort. And free school fruit tend to reduce social inequalities.

For the happy news, last year the Norwegian government decided to give some pupils free school fruit so all pupils in Norway from grade 8th to grade 10th have now Free School Fruit every school day. We hope that they will continue and we also hope that they want to include the classes we want to grade 7th. One of the reasons at least the politicians decided to give Norwegian schoolchildren free school fruit was that in 2005 we had an election and before the elections the three parties that are now in the government all wanted a free school meal not only free school fruit. So, that kind of made it easy for them to at least give some children free school fruits.

Just a final point I want to make not about the fruit but in Norway we import 95% of fruit and I think the amount that we import is increasing. We only half of the fruit that we should, the recommendations are at least two portion a day. But the funny thing not really funny but calculations have been done is that there are enough blueberries in Norwegian forests to meet all the daily portions of fruits every day and I think it is kind of stupid that we import that much.

Q&A

PUBLIC (Corinna HAWKES, Freelance Consulting and Research or the University in London): I have a question for all the speakers about taste. In any of the studies that you have done did you evaluate whether the children liked the F&V more than what they had been offered before? Where is the taste element in that? Did they found it tastier or else? Because I heard anecdotes that, let's face it, not all F&V taste that great, sometimes it is not such great quality and how important was it to make it really tasty in the success of the interventions?

C PEREZ-RODRIGO: In Pro Children we really included tasting preferences as part of the intervention component. We included tasting activities and we also suggested taste testing at home preparing recipes based on F&V that they could prepare whether at home or in the schools and then share it together as part of the tasting activities. In the evaluation we looked to that. But, certainly from the literature we can tell you that preferences is really a strong predictor of the amount consumed and it should be insisted and not just on limited actions but over time on the tasting activities, an higher exposure to wide variety of F&V both at home and at the schools.

S Te VELDE: I remember we looked at the effects at the preferences and taste and what I do know is that the children already had a high level of liking fruits so it was hard to improve the liking of fruits. But, for vegetables it could be a bit better. We had some results on the liking of vegetables but I do not know them by heart but I know it is an important issue.

PUBLIC (Robert PETER, from Danish Cancer Society): Just a comment because I have done a lot of work with running school F&V schemes and I think one of the biggest issues is taste. If the children do not like the F&V then the program do not work very well so we have done a lot of research on how children taste effect of the varieties that we choose. Availability, accessibility is key but I think, taste, quality, seasonality, freshness is really key to work in school fruit schemes.

PUBLIC (Ron LEMAIRE, 5 to 10 program in Canada and IFVA chair): I have a question on impact on home consumption. I know there has been a reference, comments about Food Dude where it has seen impact on increased consumption at home, an impact to also the educators that were involved in the program. Have you seen any research that has shown either positive impact at home and/or negative? Whether the responsibility of the parents in a free schemes happening basically is seen as now being transferred to the institutions as opposed to the home?

K LOCK: As I pointed it out, the problem is that there are a lot of interventions that have looked at different combinations of components; some were free, some with

subscriptions plus or minus parents, plus or minus education. So we can not actually say. There have been a number of studies I showed between younger and older children and again the parents were involved in different ways. It is not easy that we get parents to do activities for themselves or actually doing activities for the children or reporting on what happened at home. It does seem to be a positive thing but we can not say whether or not it is essential or whether it adds a significant amount of extra in terms of intake. I think it seems anecdotal about what you are saying that is are we transferring responsibilities to the institution by doing school F&V schemes and it does not seem to be any evidence of that. Actually there numerous examples that by raising awareness through schools and through children and very big branded product, promotion products and schemes it actually seems to have beneficial effects even wider than schools and parents. So that is only anecdotal, sorry about that.

C PEREZ-RODRIGO: In the Pro Children program, at least in the interventions in Spain we had a discussion regarding this because we started the provisions of free F&V in the schools which were already provided through school meals but an additional component of provision of Fruit for fruit break. The debate was about the schools really complained that whether they should be providing this or it should be more highly encouraged the participation of families who would provide the fruit so that the children bring themselves the fruit to schools. We had this debate. I can not remember the reference on an intervention providing free F&V in schools that was observing a shift so that overall consumption did not change because since family thought the children have it in the schools then they provided less at home.

PUBLIC (Christina POLLARD from Australia): A lot of the programs are being conducted in countries where you had high awareness programs or campaigns promoting increasing awareness of the amount and types of F&V should be eating. I am assuming there is some awareness of the general community that is very important of F&V that people should be eating more. That multi component approach where perhaps there are other interventions together with school schemes and interventions, that would create an environment that would encourage increased consumption across the board. I just wanted to comment about the multi-component strategies and where school programs fit or may fit?

K LOCK: Apart from my main research, it is exactly what Carmen Perez was presenting on the sort of environmental, the wider environment and what Pro Children had studied in more obstructive determinants. Absolutely, there is lot of research and very various people have been looking at this sort of wide environmental determinants and of course that the whole F&V schemes are just one part of that. That is why the Pro Children study is very innovative because it was looking at individual family schools and the wider environment.

PUBLIC (Anne-Marie SOUQUET du Réseau de Prévention de l'Obésité Pédiatrique en Ile de France): Nous sommes en effet très concernés par les F&L mais je voulais attirer l'attention sur cette distribution de fruits et prendre simplement le cas particulier que je connais bien qui est non seulement la France mais plutôt Paris. Puisque dans Paris on a plus de 80% des enfants qui mangent à la cantine et nous avons aussi ce qu'on appelle des commissions menus etc. Dans le menu normal d'un enfant qui mange à la cantine, il a déjà à sa disposition au moins 2 fois par semaine le fruit puisqu'en France on mange un repas complet et chaud à midi. Donc, dans la lutte que nous avons, puisqu'il faut recadrer ça dans le cadre de la prévention de l'obésité, on a beaucoup parlé même au niveau européen de la distribution de ces fruits mais ce qui est important est de savoir quand est-ce qu'on va les donner. On a moins parlé des légumes qui sont tout aussi important. Je voudrais faire le parallèle par rapport à cette distribution de fruits avec la distribution de lait qu'on a eu en France après la guerre dans les années 50 parce qu'il existait une carence réelle en lait. Le gouvernement a donc permis une distribution gratuite de lait dans les écoles, ce qui était très bien au départ et qui petit à petit a eu un biais. De lait on est passé à rajouter des petits gâteaux, on a donné ça en plein milieu de la matinée ce qui fait que maintenant nous, on se bat, en on est là actuellement pour qu'on supprime cette fameuse collation du matin qui facilite l'effet pervers de faciliter le grignotage et qui est passé du lait avec des petits biscuits avec même du saucisson parfois. Donc maintenant notre but est de supprimer complètement la collation pour éviter ce souci de grignotage. On sait aussi que si on mange trop de fruits, il ne faut pas oublier la teneur en sucres des fruits donc attention, des fruits oui mais 2 ou 3 fruits par jour attention. C'était une réflexion que je voulais vous livrer pour voir si vous aviez d'autres commentaires.

C PEREZ-RODRIGO: I think the evidence show that overall in most countries and in most places, children and young people in this particular population group right now it would be desirable. Of course they might be groups of people who are eating often F&V so this is ok and we are just trying to maintain this consumption at level but this is not the case for most people. So, any strategies in trying to get higher consumption levels would be welcome. And I think strategies need to be comprehensive, multifaceted and multi component to be effective. So we are now focusing a lot on environmental actions like the provision of increasing availability and access to F&V because it has been proved that this contributes to enhance consumption and particularly to decrease inequality in access to F&V and I think that this is the sort of main key fact. However, the provision of F&V only is probably not likely to be effective, it should be complemented by other action like educational strategies and we have seen from the review on determinants that self-efficacy is very important. Being aware of the amount that each one is consuming and what would be recommended levels is also important. What the children experience in the schools and in the family is very important. So, there are a lot of component that should be looked at and should be included and not only, not just the provision of

F&V. The provision increases access and increases availability and that is also very important and is also very important for disadvantage groups. I think it is just looking to population we are working with and look into which are the specific needs and the specific characteristics of this particular group. We really believe in working in Pro Children where we were working in 3 very different countries: one Nordic country the Netherlands which is quite up North in Europe and Spain in the South of Europe, all with different cultural backgrounds and different SES conditions even in the participation both in intervention and control schools and we have to be keep all these factors in mind. It is essential in any interventions and health promotion that we look into these factors and try to choose what is likely to be more effective and more adapted to the real life. And also looking and I think this is very important, to sustainability and not just for a pilot intervention that would be concluded after few months but looking in the long term. Other considerations regarding the content of sugar and displacement for the fruit, I think that should be part of the overall intervention.

K LOCK: On the Paris experience it was interesting you were saying about the milk scheme and I think most of European countries now are getting rid of school milk for the reasons you pointed out. But if you did not hear the presentation by Barbara Rolls, I will recommend you look at her research which seems to show that actually introducing F&V as a snack or F&V in the meal which is what is obviously you do in France, is going to be good. People are going to eat less, less high density energy food and hopefully tackle overweight and obesity so I do not think you have to worry about increasing snack provisions as long as it is F&V and putting them in the meals as well. But also I think you are right, when we looked through the systems in the Pro Children studies, every school system is different. Some have school meals, some do not. Some have snacks programs, some no. We are solely focus on snack programs.

PUBLIC (Helen MUEHLHOFF from FAO): I would be very interested to know from the panel what readiness there is in European countries, the Ministries of Education to actually integrate food and nutrition education into the curriculum. I think we have seen and heard from these various studies that there are obviously some very excellent efforts ongoing but they seem to all be on a pilot scale. So, I would like to know what initiatives are there in place to integrate food and nutrition education into the curriculum to provide children not only knowledge but also the skills and the motivation that they need to change their dietary habits in a longer term.

P DUDLEY: The New Zealand program is not a pilot and the curriculum has fully been liked through the health promoting schools and bringing to home involved into the provision of the F&V. There are going to be about 100 thousand children by probably the end of 2008 and as I said before is getting well evaluated.

K LOCK: (...) When I look just in terms of F&V schemes, there were number of coexisting nutrition and education programs running alongside these schemes that are already embedded depending on the school system. We did not look at them in particular, some of them were not necessarily focused on F&V obviously there was various nutrition intervention initiatives. I suppose what you have been hearing here is that only those ones that are specific to the school F&V schemes that we have discussed so I think there is a difference and you are right. Some people have integrated the F&V programs within a wider nutrition education curriculum and some have stand alone education components but absolutely sustainability will be ideal to have everything integrated. I do not know if someone now has done the analysis in that respect in detail.

PUBLIC: The Food Dude program did show that based on evaluation in terms of teachers and parents that there was an increase in terms of portions that children were bringing to school and this as such that there was a clear demonstration of the positive effect beyond the children themselves and also the families as well as the teachers. This was a 12 months evaluation but I think that is a quite important one and I think we need to expand that to other programs. About the school milk, Karen Lock said we were going to stop it, absolutely not; on the contrary we want it to be a success therefore we have directed it into more healthy types of dairy products with low fat and that is the reason why we changed completely the system. I do not want to suggest that dairy products are unhealthy, that is certainly not the case. I think about almost diets include also dairy products. We are trying to change it from high fat to low fat with more healthy results. The last issue about whether there is a nutrition policy, in fact I think this is an important thing and the school Fruit Program on an EU based could be sort of the start or an initiative which could also inspired because we are asking for a national strategy and this would also include obviously, taking into account wider aspect that just the consumption of F&V.

SESSION 15

F&V NUTRIENT PROFILING: WHAT ARE WE GOING TO BE ABLE TO SAY IN THE FUTURE?

Chair: **A. Martin**

- Introduction? **A. Martin**
- Nutrient profiling of foods: a systematic approach. **M. Rayner**
- Validating nutrient profile models. **J.L. Volatier**
- Nutrient profiles, pleasure, and cost. **A. Drewnowski**
- How to communicate nutrient profiles to the consumer?
 - o AFSSA point of view. **A. Martin**
 - o EFSA Representative. **L. Heng**
 - o Consumer's association representative. **Ch. Pernin**

Introduction

Ambroise MARTIN

Faculty of medicine, Lyon, France

My name is Ambroise Martin, I am a professor of nutrition, and biochemistry also, in a medical school and in Lyon in France. I am a member of the expert committee of the French Food Safety Agency, and I chaired the working group of nutrient profiles. I am also a member of the NDA panel, Nutrition Dietetic Products and Allergy, in the European Food Safety Authority. And I am also member of the working group of claims in this agency.

So as most of you already know, nutrient profiles is a very hot topic in the European context since the publication of the new regulation of claims, and the introduction of nutrient profiles as a condition for the food to be able to bear a claim. Since the first discussions about the introduction of nutrient profiles, there have been many, many works on that in the scientific community. Since a long time, nutritionists, dietitians, use nutrient profiles. But they use them in a qualitative way to do counseling of the patient, and the challenge for the nutritionist was to develop nutrient profiles in a quantitative way in a regulatory context. And also, there is a constraint of a timeframe because the nutrient profiles system should be adopted by the Commission by the end of January of the next year. So for the moment, theoretically, Member States are negotiating what could be the European system.

So we do not know what could be the final result. We can give some indications about what has been done in some countries, for example, in the U.K. and in France, but there are many, many other systems. And the list compiled by the FSA indicated about 38, perhaps 40 now, different systems in the literature, including the gray literature.

So the first presentation will be given by Mike Rayner about the development of the food standard agency model, and as an example of a systematic approach, how to answer to the questions which are in the regulation. And then a presentation will be given by Jean-Luc Volatier because science cannot answer to all these questions. And one of the ways for the input that science can have, is to try to assess the result of the system, how can we be sure that the system gives the right result and the expected result, and so on. So there will be something about that by Jean-Luc Volatier.

Then the third presentation by Adam Drewnowski about things which are not in the regulations, but which could have very important consequences for the consumers about pleasure and cost in relation to nutrient profiles.

So it is a logical order, and I propose to be on time and to stop at 7, to begin with the first presentation. Before that, just a word. The presentation will take about 15

minutes, so I think we will have 5 minutes for discussion. It could be, perhaps, interesting to reserve after each presentation to have few, very specific questions about the presentation, perhaps to have more time after the first 3 presentations for general discussion when you will have a clearer a view of all the problematic.

Nutrient Profiling of Foods: A Systematic Approach

Mike RAYNER

British Heart Foundation Health Promotion Research Group, University of Oxford, UK

Thank you very much, the organizers, for inviting me to speak about the nutrient profiling of food, a systematic approach. Because I am the first speaker, I have the luxury of introducing the subject to you, so the aims of my talk are going to be to define nutrient profiling, what do we mean by nutrient profiling? Look at some things that are around why we need it, then to talk what systems are developing models, and that's the main body of my talk, and then briefly to talk about validating and comparing nutrient profiling models.

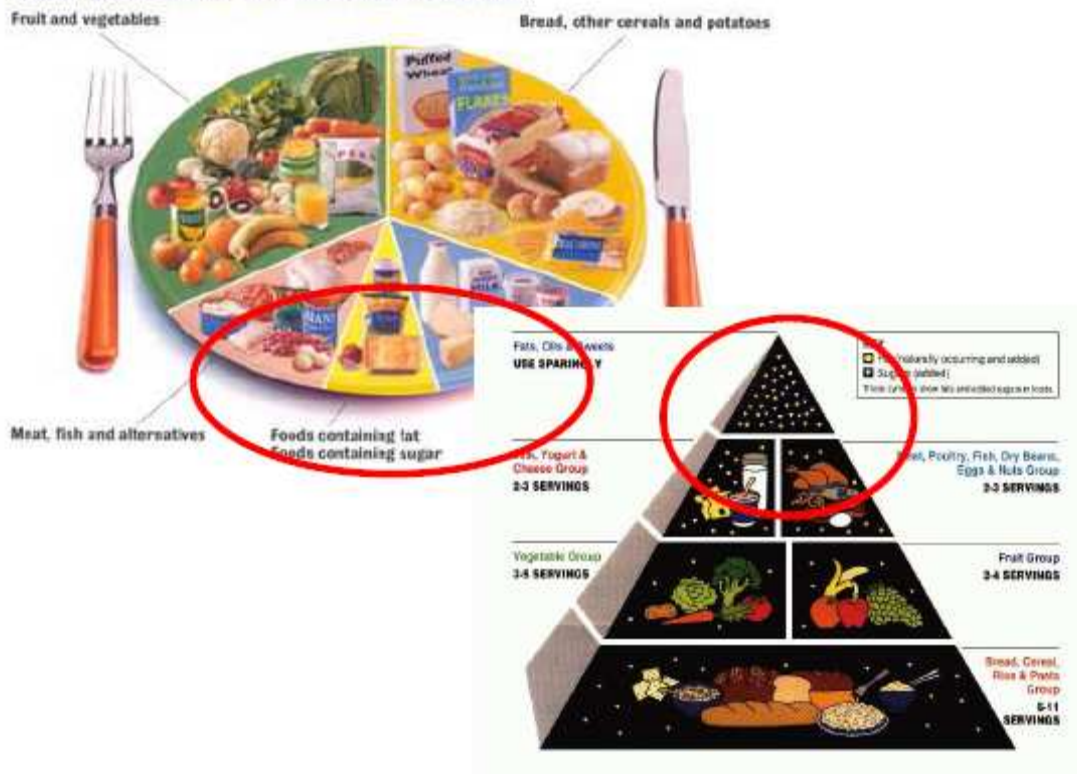
So, what do we mean by nutrient profiling? Well, this is our definition in a publication by Michael O'Neil, 2004. We think nutrient profiling is a science of categorizing foods according to any nutritional composition. And this means that nutrient profiling can provide definitions of terms applied to food such as high or low in a nutrient like fat. High or lower in a nutrient relative to foods of the same category, but in this talk most likely I'm going to be talking about these last 2 types of definitions generated by nutrient profiling models. Healthier and unhealthy, per se, or less healthy and healthier, per se, and also healthier and less healthy by comparison by foods in the same sorts of categories. I think it's important to distinguish these 2 meanings of the term, "healthier" and "less healthy."

How I think nutrient profiling works is by coming out with definitions of things like the healthiness of foods. But, of course, food by itself cannot be 'healthy,' it's only a person that's 'healthy.' So the concept, healthiness of a food, is a theoretical construct related to the healthiness of a diet, and in turn, the healthiness of a diet is related to the health of people.



The healthiness of foods has quite long been talked about, even though people have generally said there is no such thing as healthy or an unhealthy food, only healthy or unhealthy diets. These are food guides, and the food guides, you always have food in the food guide which people should eat less of, at the bottom of the plate in the British model, or at the top of the pyramid in the American model. So I think the concept of the healthiness of a food isn't such a radical concept as it might seem.

The Balance of Good Health



Why do we need definitions of things like healthiness of a food? Well, largely because of increasing emphasis on the marketing of food, and the need to regulate the marketing of food, not just the advertising of food, as we heard about yesterday, but also the product, itself, its composition and its labeling, the place where it's made available through vending machines and schools, etc. But also the price of food. And I think as we move towards more and more of a problem with obesity there are increasing emphasis on trying to regulate the way foods are marketed. In particular, the unhealthy foods, not just the healthy foods like fruits and vegetables which we have been talking about most these few days.

My group got interested in nutrient profiling largely through helping the Food Standards Agency in the U.K. to develop a nutrient profiling model for the definition of an unhealthy food for the purposes of regulating foods to children. And this document is the new regulations put out by Ofcom, the broadcast regulator in the U.K. which sets new rules for advertising of foods to children. And these rules only apply to unhealthy foods, junk foods or whatever you like to call them. And the nutrient profiling model that we developed for the FSA is the basis for these rules. That model is summarized on this side, some of you might have seen yesterday. Basically, it defines an unhealthy food on a basis of 7 components: energy, saturated fat, total sugar, sodium, protein fiber, and fruit, and vegetables, and nuts. You score points for the top 4 nutrients, and use points for the bottom 3 components, and you end up with a score. And if you score more than 4, you are deemed to be less healthy

or unhealthy food. And similarly with drinks, although the scoring system is different for them. And less than 4 you are a healthy food and you can be advertised to children on television.

It classified foods in this sort of way; this is just a sample of foods. Some of these foods clearly aren't controversial. Most people would agree that a Mars bar, perhaps, or a jam donut are unhealthy foods, and a peach or lettuce are healthy foods. But there are some more controversial foods on this table such as cheddar cheese. Well, cheddar cheese is a good example of where the model creates controversy around the classification of foods, which we can go into later.

How do we develop this model? This is the main point of my talk, is that we developed a systematic approach to developing a nutrient profiling model. A planned staged approach. Lots of people in the past have developed nutrient profiling models, but quite often, these are done rather randomly. So what we tried to do was develop a more open and transparent way of developing a model. And we proposed that you needed to go through these 7 steps. The nutrient profiling model had to fit or relevant to the purpose for which it was to be used, in our case, the advertising of foods to children. You had to look at the group or population the purpose was relevant to. You might need different models for food advertising aimed at children, than you would need for food advertising aimed at adults, for example.

But the big issue, of course, one of the most controversial issues in relationship to a nutrient profiling model, is whether they should be across the board, or a food category-specific. And I'll try to explain in the next slide what that means. Our model categorizes foods across the board. It ranks foods from the most healthy, in this case the apple, and the least healthy, in this case, the chocolate cake. And it puts foods roughly on that spectrum. Apples, avocados, skim milk, whole milk, olive oil, butter, fruit cake, and chocolate cake. Category-specific, however, would do the following, it would rank the healthier foods as apples, and less healthy foods as avocados, the skimmed milk as healthier, the whole milk as less healthy, the olive oil as healthier, the butter as less healthy, the fruit cake as healthier and the chocolate cake as less healthy. And clearly, they are 2 very different types of conceptual models here around the categorization of food. And I think to some degree, it's a matter of choice whether you choose a category-specific or an across the board model.



As Ambroise said, we've looked at existing models around the world, we think it's about 38-40 at the moment, and half of those, roughly, use a food category-specific approach, and the other half use an across the board approach. But the category-specific models use a wide range of numbers of different categories, ranging from 71 in the case of the model underlying the Australian Tick program run by the Australian Heart Foundation, to 3 in the case of the nutrient profiling model underlying the rules around the U.S. health claims.

The next stage in the systematic approach is to decide on the nutrients. Again, this, I think, is rather simple compared to some of the other decisions in this approach. But of course, there is a whole range of possible nutrients, 100's, I think, which you could include in the model. This is just some, and to show you some of the types of options you might end up with. Our model, as I said before, involves 7 components, those highlighted in red here. Other models involve more components. This is the nutrient profiling model underlying the Kraft Sensible Solution endorsement scheme which has 18 different components.

There is some similarity between models, generally they use saturated fat, generally they use sodium, they use either energy or total fat, and they often involve, not just negative nutrients, nutrients that we'd like the population to cut down upon, but also positive nutrients which we'd like people to eat more of, such as fiber and vitamins and minerals.

The next decision that has to be made is in relationship to the base, the reference quantity on which the model is constructed. You have basically 3 options here, the per 100 grams, the per serving, and the per 100 kilo-joule base. Our model uses a per 100 gram base. And because of this relationship between healthiness of foods and health, the healthiness of foods in nutrient profiling is defined by the nutrient composition. But the nutrient composition isn't the *only* thing which affects the nutrient composition or the healthiness of a diet. It's also affected by things like the serving size and the frequency of consumption, and also the combination of foods

which you eat. For example, one of my illustrations is strawberries which are, on the face of it, quite healthy. But because I generally eat them with cream, the combination of strawberries and cream makes strawberries less healthy. And you can think of lots of examples around spreads and bread, and breakfast cereals and milk, and so forth. Basically you have to choose whether to incorporate these things like serving size, frequency of consumption, or combination, within your model. And some people do and some people don't include serving size criteria within their model. If you don't choose a serving model, you do run into some problems with foods which come in small servings, but which are high in fat or sugar or salt, such as [...] and honey. But also, some foods benefit from a per 100 gram model, such as meat with cheese-based ready meals. But generally, when constructing models, it's the people who do badly under the model who complain, rather than the people who do well under the model.

Finally, validating and comparing models. It's all very well and good having a systematic approach or a logical and transparent way of constructing a model. But how do you know whether the model is doing what we'd like it to do?

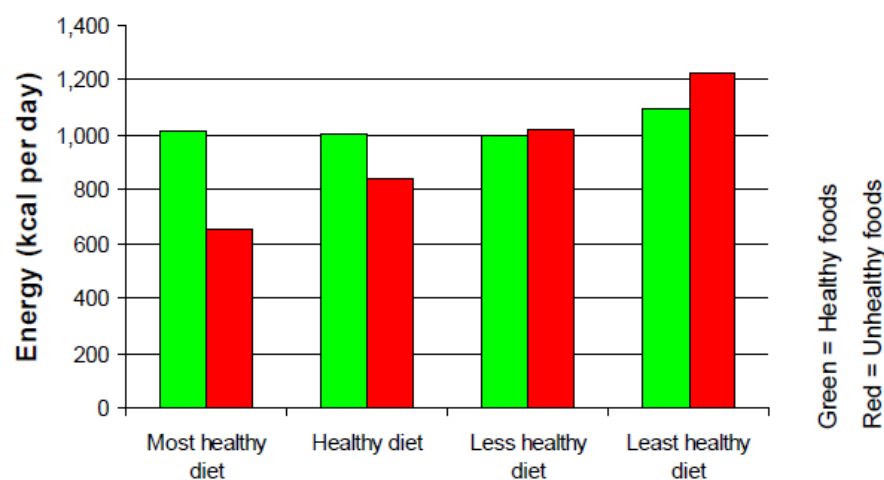
We've come to the conclusion that there are 3 different ways of validating nutrient profiling models. And I know Jean Luc is going to talk about some of these later. We think there are 3 methods of validity testing based on epidemiological approaches, to the validity testing of new scores like a quality of life score or even species diversity score for an environment. Content validity, criterion validity, and construct validity defined in these ways.

Content validity is really just taking into account all the important dimensions that need to be measured by your new measure, your new score. And that's partly addressed by developing a systematic and consensual approach to the development of the model. Perhaps more interesting are these 2 latter methods, criterion validity and construct validity testing. Criterion validity is comparing how your new measure measures against or compares against a gold standard. But because I think nutrient profiling is a very new field, we don't actually have a gold standard for which to measure new nutrient profiling models against. We have tried to do that in relationship to things like the views of nutritionists, but you can see that the views of nutritionists aren't necessarily a gold standard, they are quite subjective. So perhaps what we've been leaning towards as the best way of validating nutrient profiling models is to use construct validity testing, examining the relationship between the new construct and other constructs. So going back to that model, looking at how the construct of the healthiness of foods relates to the healthiness of a diet, and to health, ultimately.

And briefly, to summarize the results of our validation study of the construct validation study of our model which we developed for the Foods Standards Agency,

what we did here was divide people in the U.K. into 4 groups, depending on the quality of their diets, defined by a validated diet quality index. We divided into the most healthy diets, the healthy diets, the less healthy diets, and the least healthy diets, and looked to see where they were getting their energy from, in terms of the foods that we defined as healthy or less healthy by our model. And this graph shows that the people with the least healthy diet get most of their diets from least healthy foods, and the people in the most healthy diet get most of their energy from the healthier foods defined by our model. So this, I think, gives us some hope that the model is actually measuring a real construct related to the healthiness of foods, and gives us some degree of certainty, validity, if you like, for the model.

Validation study results



Source: Aramebepola C, Scarborough P, Rayner M. Validating a nutrient profile model. Public Health Nutrition, 2008,11:371-9.

The issue that people are now struggling with is how do you compare different models, really? Because it's all well and good saying that you've got a good model, but how, amongst the 38 models that we've come up with in our review, which is the best? I'm not really going to offer you any solutions to this problem; I think it's a really very difficult problem which people are still struggling with. But I do think it matters. This slide shows you that if you are trying to relate to the construct healthiness of a food to the healthiness of a diet, not all foods in an unhealthy diet are unhealthy. Clearly, here is a typical British breakfast. Tomatoes are defined as healthier by our diet. You can have a very unhealthy breakfast, and still have *some* of your foods, as healthier foods. [...] [...] is in this instance.

I think it does matter how models categorize foods, this is just a brief, looking at 3 of our models from our recent review showing that the 3 different nutrient profiling models do classify foods differently. Our model is the top one. [...] Choices model is the next one down, and the Swedish keyhole system, the model underlying that is the bottom one. And you can see at the extremes like your bread and cola, models

generally agree with one another, but there are lots of foods in the middle like ham, and ratatouille, and baked beans which are classified differently by different models. Does it matter that these foods in the middle, between the 2 extremes, are classified differently by different models?

This slide shows that different models generally agree, again, on the extremes. So here, I've plotted the scores generated by our model against the scores generated by a model developed by Adam Drewnowski, a naturally nutrient-rich score on the bottom. It's quite a good correlation between the 2 scores. The unhealthiest ones on our scoring system, toffees, are at the top of the model on the left. And the healthy one, celery, is at the bottom right. And you can see from this that we and Adam agree on celery and toffees. But we don't agree on things like whole meal bread and apples, ham and bran flakes. Our model classifies whole meal bread and apples as healthier, whereas NNR doesn't. And our model conversely, classified ham and bran flakes as being unhealthy, but the NNR model classifies [...] as healthy. And this is because they are based on slightly different principles. Our model pays bigger attention to the negative nutrients in the model, the saturated fat, and the sodium, and the energy density of the foods. Whereas, the NNR pays more attention to the positive nutrients, the micro nutrients in food. So depending on your choices and your approach to the development, you do end up with different classifications on your model.

And just to look at 3 different other models, there is more agreement between some models and others, so our model agrees very strongly with the Swedish keyhole scheme, but not so well with the [...] Choices model.

So just to leave you with some questions, really, for pondering. The big issue is can we relate healthiness of foods to health? Again, not just looking at the relationship of the healthiness of the foods to the healthiness of a diet, but to health overall. I think this is an unresolved and yet to be answered research question. Another big issue for me is how do we define categories for category-specific models if you choose to have a model which has different criteria for different categories? And nobody has really come up with a solution to that problem. There again, lots of different options, in terms of the actual categories, and in terms of the numbers of categories. Is one model sufficient for all purposes? I think this is an important issue. The model we developed was for the advertising of foods to children, regulation of the advertising of foods to children. Would it work for health claims? And is there a good model method for comparing models? At the moment, I think we need more research effort to come up with better ways of comparing models, not just looking at the data, looking at the way different models categorize foods. So 4 questions which you might like to think about for the rest of the session. Thanks.

A. MARTIN (President of the session): We move to the next presentation by Jean-Luc Volatier who is the Head of the Unit in the Food Consumption and composition of the French Food Safety Agency.

Validating Nutrient profile models

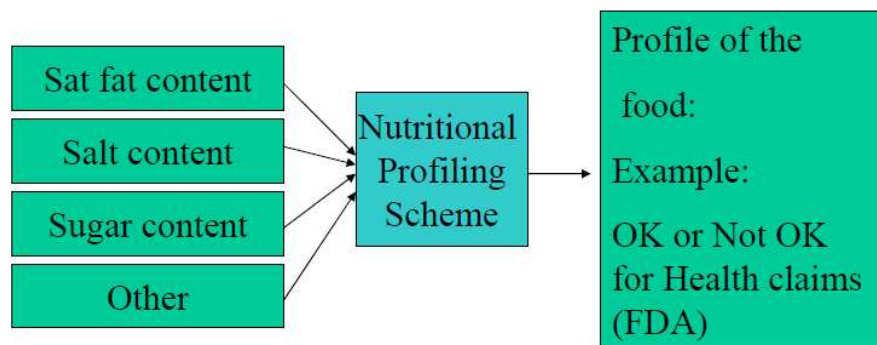
Jean-Luc VOLATIER

AFSSA, Maisons Alfort, France

So I will try to add on to Mike's presentation on validating nutrient profile (NP) models to put more scientific information in the choice of the different systems that exist at the European level. A nutritional profile is a kind of black box that uses information on the food composition and content to define a profile that is okay or not okay for health claims.

What is a nutritional profiling (NP) scheme?

- « The categorisation of foods for specific purposes based on an assessment of their nutrient composition according to scientific principles » (O'Neill, 2004)



Fruit and Vegetable Summit 2008, Paris 29 May

There are for instance, profiling systems by the FDA, the FSA and others. The purposes are very different from one system to another. And the criticisms that are usually sent to these NP schemes are that there is a lack of objective agreements to choose a system, and that there is a lack of scientific validation. The results that have been shown depend on the profiling method chosen. A more general criticism is that there are no bad or good foods from a nutritional point of view, but only favourable or unfavourable diets.

Because of the new regulation on health claims in Europe, there is a kind of revival of work, after the works that were done in the 80's or in the 90's in the U.S., to do more research on this question of validation of nutrient profiling scheme.

So most of the existing nutrients profiling schemes for the moment have not been really validated because they have been considered more as a risk management tool, and not a completely scientific issue. But some choices of the parameters that are

used in the nutrient profiling schemes may be considered as self-validating. It is the case, for instance of the maximum percentage of fat in a food product that can be derived from the rate of desirable reduction of the percentage of fat to achieve the recommendation, for instance, of less than 35% or less than 30% of energy from fat. So there are some criteria that are easier to validate than others.

And some nutrient profiling systems are more or less directly derived from this kind of recommended intakes. But on the other side, if you consider different systems, you can see that you can profile the same foods differently. For instance, if you consider ordinary cornflakes in the FSA WXY system that has been shown by Mike, the profile is “less healthy”. For the FDA profiling system for health claims it is “okay”. And for the Dutch “Tripartite” system, it’s considered as “exceptional”. So you can also show contradictions, for instance, for boiled potatoes. There are a lot of foods like that whose profiles are different according to the systems. The question is: is it possible to find some profiling systems that are preferable to others, for a certain point of view, for a certain aim of regulation?

So I don’t have exactly the same categorization of the different methods of Mike Rayner. The traditional one is to use expert advices; it’s based on nutritionists opinions and it is a qualitative method. There are also validation methods based on nutritional surveys, and the group of Mike Rayner organized this type of survey, which is different from the first one because it’s a quantitative method based on the rating, the opinion of experts, about the quality of foods on a nutritional point of view. But the problem is that this approach is linked to the culture of the country where the survey is done.

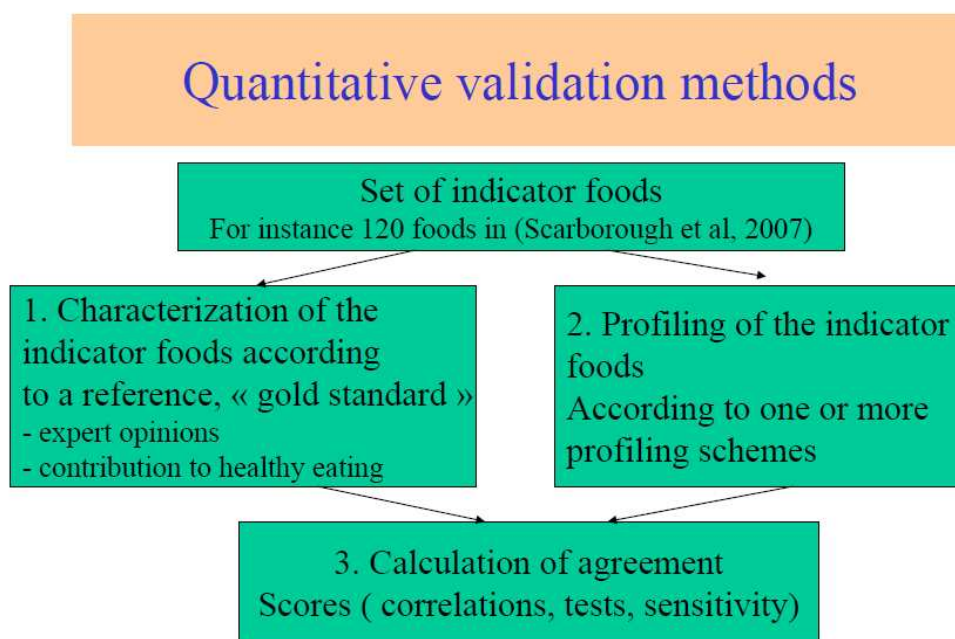
Then we have a new set of category of validation methods that are developed in different research groups, based on trying to make a link between intakes and profiling of foods, with the idea that we are more able to qualify a diet from a nutritional point of view, than foods. This approach is based on mathematical modeling and I will show you part of what we’ve done to try to validate 3 systems of nutrient profiling in 5 countries, in trying to measure links between quality index of the diets with the profiles of the foods.

There is also a fairly new approach which is also very promising, but also very recent, which is to try not to consider diets in real life, but to build theoretical diets that are associated, or not, to nutritional recommendations, and use these diets as a way of qualifying the foods that participate, or not, to the diet and then try to see if food with a good profile are well-linked to these theoretical diets.

And finally, there are also testing method that are more in the field of feasibility, easiness to use, that are considered also as a part of the validation. So there are different techniques of nutrient profile validation according to different aims, and of

course, it's necessary, probably, to combine the different validation types.

Most of these validation methods are based on a kind of gold standard and a set of indicator foods that could be used as a gold standard for qualifying the systems. For instance, in the method of Mike Rayner with the initial survey, we have 120 foods and they are characterized by the opinion of the surveyed experts, and then you compare it to the profile of these foods using different profiling schemes. And then you calculate different agreement scores, and it's a method of the validation.



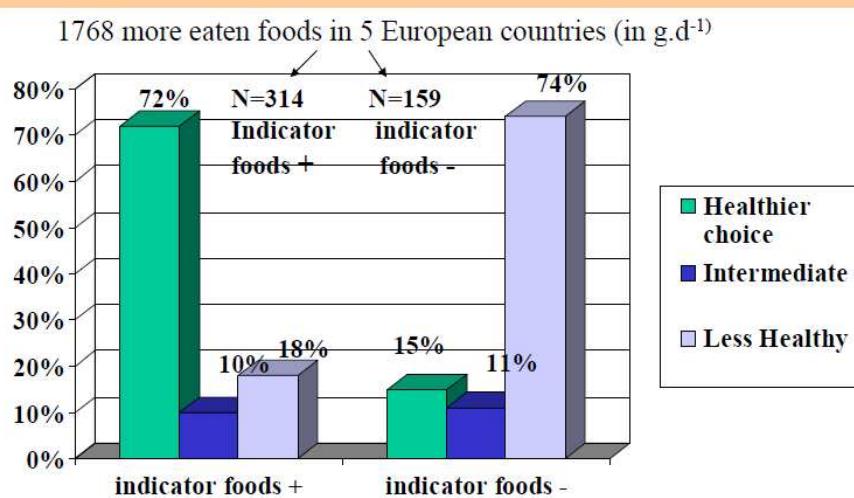
Fruit and Vegetable Summit 2008, Paris 29 May

In our group, it was a European group, we tried to define the gold standard, this time not on the opinion on experts, but on defining healthy diets based on the Eurodiet European recommendations, and then identify the foods that are associated positively or negatively to this healthy diet. So this gold standard allowed us to identify in 5 different countries, Belgium, Denmark, France, Ireland, Italy, a lot of individual foods that are mainly fruits and vegetables-based products, or dairy products, or cereal products for the foods that are associated to the healthy diets. On the other side, meat and meat products, fats, cakes and pastries, and potato-based products are negatively associated to the healthy diets. But these indicator foods that were identified in the different countries, are a minority of the foods eaten, so there were a lot of foods that we are not able to qualify either as positively or negatively associated to a healthy diet. Another problem is that we found that these indicator foods were different from a country to another. That shows that the validation method based on indicator foods are country-specific because there are broad differences of habits between EU countries.

The second part of the validation is a comparison between these “gold standard” and

profiling schemes. For instance, the FSA WXY model that was presented in the first presentation is very well correlated with our indicator foods. We are sure here that among 1768 more frequently eaten foods in the 5 countries, we see that we had for those foods that we are able to qualify, 314 indicator foods positively associated with a healthy diet, 72% of them were profiled as “healthier choice” by the FSA model. So there is a good agreement. On the other side, among the 159 indicator foods that were negatively associated to the healthy diet, 74% of them were quoted as “less healthy” by the WXY model. So you see that there is an overall good agreement. The problem is that this overall good agreement is always on a limited number of foods. We find the same result, for all the models. So there are very little differences of validation results between the different profiling schemes that do exist.

Characterisation of the indicator foods according to the different profiling schemes : FSA WXY model



Test X2 : $p < 0.01$

Fruit and Vegetable Summit 2008, Paris 29 May

There are other approaches that are developed, so this approach based on the work of Arambepola and the work of Mike Rayner, trying to link the profiles of foods to food based dietary guidelines and to quality indexes and we can see in this paper that there is a good agreement because fruit and vegetables products that should be eaten a lot, according to guidelines, are mainly classified as healthier foods by WXY model. So this type of validation study are slightly different from the others that I presented to you, and it brings results that are very, very close, in fact.

There are new ongoing research and validation of nutrient profiles; in particular a new method based on the definition of optimal diets that allow meeting nutritional endpoints. The method of Nicole Darmon which begins to be published, but it's an ongoing work, is based on the use of linear programming with nutrient intakes as a constraint, and a range of energy intake compatible with the usual intake as an

output. The interest of this approach is to use diets that really meet nutritional endpoints as “gold standard”. So there is no need in this approach to find individuals who are really linked to these endpoints. You have a kind of “pure ideal diet” that is really linked to the nutritional endpoints on the nutrients, on vitamins, minerals, and so on. And then for these diets, there are no confusing factors that bring artificial association between foods with good profiles and foods with less good profiles. That was the problem also, that was quoted by Mike.

The inconvenience of this approach is the risk of selecting diets that are unachievable considering socioeconomic constraints. So there is a need to study these diets and introducing socioeconomic constraints in the study of these diets.

So in conclusion, you can see that the question of the validation of nutrient profiles is an ongoing research sector. There are different quantitative validation methods for profiling systems that have been proposed in the last 2 years, some of them very recently. And they are based on quantitative surveys on expert opinions, association or contribution of foods to nutrient intakes according to dietary surveys. The contribution of the food to the diet seems to be a better criterion than the association because of the correlation that can be linked to artificial correlation, like the fact that you may eat at the same time bread and jam, for instance. So contribution to the diet is a better criterion. There are definitions of theoretical diets now meeting nutritional endpoints as a golden standard. And this can bring the possibility to analyze a contribution of profiled foods to these diets.

About the question of fruits and vegetables-based products, all these approaches are converging, especially for the profiling of these foods. They are mainly profiled as “healthy”. Most of the difficulties are for intermediate foods that are fruits and vegetables-based products. How to consider them? One of our problems is that these approaches are country-specific and there is a need of a country by country validation if a model is used at the international or at the European level. Thank you for your attention.

Q&A

PUBLIC: Did I understand correctly that the gold standard that you’re using in your model is one which is derived from ILSI and they are a food-dominated organization. Do you think this gold standard has a scientific credibility? Why did you choose it?

JL VOLATIER: This gold standard is based on the Euro diet recommendations as a basis, which are independent recommendations. Then there is a methodology to provide from this Euro diet recommendations a categorization of the foods and the gold standard. And I participated in this group, so I feel free to say that we had

absolutely no pressure, no attempt by the industry to influence the work of the participating researchers. So even if it has been done in an ILSI group, all the researchers who published the paper were from the public sector and we had really no problem to say what we wanted to say.

A. MARTIN: It's a very interesting point. It's somewhat auto claim, auto proclamation as a gold standard *[laughs]*. It was the best at the moment because when it was developed only the expert judgment was used. But we can say also that there is some type of circular validation because Euro diet criteria has been established by experts who also considering many things. So perhaps the true gold standard will be the direct comparisons to health. But for the moment, we have not the methodology to do that. So it's a very stimulating area for research. Any other questions?

Nutrient Profiles, Pleasure, and Cost

Adam DREWNOWSKI

School of Public Health and Community Medicine, University of Washington, Seattle, WA

Good afternoon, ladies and gentlemen. My presentation today has got 2 very, very simple aims. I'm going to be talking about nutrient profiling in relation to nutrition, cost, and pleasure. And I want to do 2 things. I want to introduce the Nutrient-Rich Foods Index, and I want to apply the Index to a problem in public health, and the problem is the selection of new foods for the WIC package. WIC stands for Supplemental Nutrition Program for Women, Infants, and Children. And the foods allowed under the WIC package in the United States are being evaluated this year for the first time in 35 years. So this is a clear case to apply nutrient profiling to a concrete example in public health.

And let me just say this up front, the way that nutrient profiling in the European Union and in the United States is very different. The motivation in European Union has been the imminent arrival of nutrition and health claims. Only foods with favorable profiles will be allowed such claims. Foods with unfavorable profiles will be disqualified. This is not the case in the United States. Nutrition and health claims have been allowed for some time. The Food and Drug Administration already has criteria for which foods are healthy and which foods can, or cannot, carry such claims. Those criteria are based by nutrient content and do not involve a total composite score. So the nutrient profiling in the sense of thorough composite score is being used largely to give consumers an easy at-a-glance method to identify nutrient-dense foods. This concept was mentioned in the 2005 Dietary Guideline for Americans, this concept was mentioned in the Food Guide Pyramid. The feeling is that the current nutrition panel in the United States is overly complex, and I view nutrient profiling essentially as the bridge between the dietary pyramid and the food label. And this is an at-a-glance index that is science-based, consumer-driven, and let's not forget, cost-conscious.

So this is the Nutrient-Rich Food Index. We are using 9 beneficial nutrients known to be good for health. They are protein, fiber, vitamin A, vitamin C, calcium, and iron, as well as vitamin E, potassium, magnesium. And we are using 3 nutrients to limit saturated fat, added sugar or sodium. All are expressed as mean percent daily values per reference amount of food. So the actual score is a simple arithmetic sum of percent daily values.

So looking at this EFSA scheme, there are a number of potential decision-points you have to make in deciding how you want to construct your score. I will want to deal with only 3 of those because other speakers have mentioned those. I will mention the disqualifying and the qualifying nutrients, our decision to base the score on reference

amounts, and our method of validating the score.

So here, notice that we are using more beneficial nutrients than many other scores, but again, the number is limited, it's only 9. We are basing the score on reference amount with a very specific way of validating it with respect to an independently obtained measure of a healthy diet.

And here we were able to benefit from previous experience of the Food and Drug Administration because Food and Drug Administration already has 6 nutrients that come into the definition of healthy foods. And those are protein, fiber, vitamin A, vitamin C, calcium, and iron. This means we included them in our score. The Dietary Guidelines have a number of nutrients identified as nutrients of concern, and so these were our guidelines of what to include among the beneficial nutrients. The nutrients to limit, again, the Food and Drug Administration also lists a number of nutrients which would disqualify a food from carrying a health claim, and of course, European Union also lists 4 of the same nutrients as being potentially disqualified. So the actual choice of the nutrients was fairly easy. And I'll show you later on of how we validated this choice.

This was a bit trickier, because you may have noticed that the British score is based on 100 grams, the French score is based on the combination of 100 calories and 100 grams, and of course, serving size as government-mandated does not exist in the European Union at this time. On the other hand, the Food and Drug Administration already operates using serving sizes. And in fact, all the American food labels are calculated per serving size. To make things difficult, there are 139 different serving sizes in existence. But there is a short cut, because when you plot the serving sizes against energy density of foods, you start realizing that the serving sizes are, in fact, an inverse function of energy density. So the serving size for sugar is 4 grams, for oil it is 15 grams, for cheese it is 30 grams, for vegetables and fruit it is 85 grams, yogurts 220, juices 240, and as a result, you have a very nice inverse relation between energy density of foods and serving sizes, which means that calculations based on serving size and those based on 100 calories would be almost exactly the same. So I suspect that the French score based on 100 calories will reflect the nutrient density of foods more closely because of the nutrient to calorie ratio, and this is very similar to what we are doing in the United States basing everything on serving size.

We then tested a number of alternative algorithms because we had, as in the French score, a positive component and a negative component. There are various ways in which those can be calculated and combined, and here we used a comparison to a healthy diet as a way of validating our approach. What we did was to take data from the National Health and Nutrition Examination Survey. For each subject, we calculated the mean nutrient-rich score for all the foods consumed by that subject on that day. We then calculated the Healthy Eating Index for that subject on the same

day independently. The Healthy Eating Index is again, a government-created measure of a healthy diet in the United States. You may argue whether or not it is accurate, whether it truly reflects a healthy diet, but be it as it may, this is right now the government-based gold standard. And we used regression analyses adjusting for gender, race, and ethnicity to see what percent of the variants was accounted for.

This is the Healthy Eating Index, it is food-based, it is based on adherence to the pyramid, and to the Dietary Guidelines for Americans. It is a 100-point scale with these components, and you calculate it independently, and then compare your score values to the Healthy Eating Index values. And these are our percents of variants accounted for. There are 2 or 3 interesting things. One, is the [...] score based only on the nutrients [...], does not account for too much of the variants. So if you have a score based only on saturated fat, added sugars, and sodium, it doesn't really truly reflect the total nutrient quality of the food. You start getting better results as you increase the number of beneficial nutrients, going from 5 to 6 to 9. And then something else happens. As you start loading up the Index with more nutrients, going beyond 11, to 12, to 15, to 23, the actual comparison to a healthy diet diminishes and you start losing discriminating power. So we actually use this method to test a number of alternative indices and arrive at the best fit. And this is why our Index is based on 9 beneficial nutrients, and 3 nutrients the limit. And not on 15 nutrients, 16 nutrients, 23 nutrients. All of those possibilities have been tried and rejected. And many of those indices are published in the literature.

So, let me move on to the next issue, how can we use such indices to improve public health? And here, I'm not talking about labeling; I am talking about how to allow consumers to recognize nutrient-rich foods at a glance. Or more to the point, how to allow WIC dietitians to identify such foods and put them on the list for the new WIC package? WIC package, as I mentioned, is undergoing a revision. WIC families starting sometime next year will be offered more whole grains, a greater variety of vegetables and fruit, less fat, less saturated fat, and less sugars. This is a major development; the WIC package has not been updated or modified in the past 35 years. Now WIC package is a form of food assistance, and these foods, the allowed foods, the approved foods, are provided to women, infants, and children under the age of 5, free of charge. The State of Washington spends \$100 million per year on WIC foods, the State of California spends \$800 million a year on WIC foods, so these are huge issues of commercial and industrial, and of course, nutritional concern.

Right now, what's permitted in Washington State are cereals, including fortified cereals, juices, frozen juices, juices fortified with calcium. But the only fresh vegetable permitted, and only to breast-feeding women, are carrots. Nothing else, just carrots, that's it. And then you have milk, cheese, peanut butter, beans, chicken, and canned fish. You will figure out from that that the major concern with WIC 35 years ago, was to provide adequate protein. So this is the old WIC package. And in fact, those foods

had never really been coded. I plotted here the currently permitted WIC foods against their protein content and notice that you have your carrots, and tomato juice and V8 juices are permitted, milk powder, formula diet, eggs, tuna, cheese, peanut butter, cereals, energy density on a horizontal axis, calories per 100 grams, protein content over here, a fairly limited number of foods. Here you have the same currently permitted WIC foods, and their fat content. Peanut butter is the only one with high fat, there is some fat in cheese, cereals, eggs, tuna, and milk. Again, tomato juice and carrots. And here you have sugar content, of course, the cereals are pre-sweetened and do contain sugar. Peanut butter has some sugar. Milk powder, juices with some added sugar, again milk, and then carrots and tomato juice. But this is a nutrient by nutrient profile focusing on protein and fat and sugar, the way that WIC dietitians have been selecting those foods.

So the issue here is, how do we apply the nutrient-rich food score to the new WIC package, and how do we demonstrate that the nutrient profile of the new WIC package is substantially improved? So these are now the new WIC foods. There are federal guidelines for what those foods are going to be, but each state has some discretions of what to allow. So, for example, what is going to happen, that fresh or processed food will be introduced without limitation, same with fresh and processed vegetables, and \$6-8 per month will be specifically earmarked for fruit and vegetables preferably fresh. It is right now not certain whether or not certain individual states would permit only fresh fruit and vegetables, or will they permit canned fruits and vegetables, which contain some sodium and their nutrient profile, may not be as favorable?

Now, of course, the WIC package has to be cost-neutral. Which means you can improve nutrition, but you can't pay more, says United States Congress, so as a result the total package has to come to the same price for the individual states. So as a result, the amounts of dairy products, the amount of cheese, and so on, are going to be reduced, and the monies of these are going to be taken up by vegetables and fruit, very likely fresh.

So the issues about cost and enjoyment and cultural issues are now coming in big, because the WIC population may not respond to foods which are highly nutritious, but either unfamiliar, not liked, or too expensive. So right now, what everyone is trying to do is to put together a package which will balance all those things that will be cost-neutral. The question is whether fresh, frozen, or canned vegetables will be used. What container of package size will be used? WIC is very specific; you can only buy whole wheat bread in 16 oz packages. The problem is, nobody makes that. So federal regulations specify that this has to be done, this does not exist, and industry is moving in to create this for the purpose of WIC. What are the lowest cost options? What about using organic produce? And then, of course, we need to allow for taste preferences, and the foods need to be culturally appropriate. So that nutrient

profiling is merely a component of the process. Other foods or other considerations come into the choice of foods, as well.

Let me show you briefly how this works for nutrient profiling. We begin here with sub-score based on the beneficial nutrients only. And here you have energy density and the nutrient-rich 9 score of the new WIC foods, and this is just the beneficial components sub-score based on the 9 beneficial nutrients. Notice, of course, that this is energy density; this is now the nutrient profile. You have a whole variety of vegetables and fruit, you have dried fruit, as well, these are now the cereals, you had them before, the cheese and peanut butter, the tuna, but the entire picture has now changed because the vegetables and fruit are now allowed without limits.

Now how about a sub-score based on saturated fat, added sugar, and sodium? This is now the negative component. And this is what happens, first of all, this is energy density and sugar content of new WIC foods. This is, of course, the total sugar content, and cereals are sweetened, but vegetables and fruit and juices do contain sugar. And this is one reason, actually, why now our Nutrient-Rich Food score, we are using added sugar and not total sugar. Because when you start looking at added sugar, this is what happens, take a look. This is now total sugar in vegetables and fruit, this is now added sugar. So as a result, if you use added sugar, the score changes completely. There is going to be some dried fruit here, I think these are dried cranberries with added sugar, there is going to be some, again, fruits and vegetables with added sugar, and of course, the cereals. So the score changes depending on whether you use added sugar or total sugar.

And now this is [...] complete sub-score, these are now some of the canned vegetables with sodium content which lowers their score. So you can see, if you want to introduce a new food into a WIC package, you can use this 2-dimensional graph to see where a new food will fit in. Right now, one issue is whether or not yogurts ought to be accepted into the WIC package. The Institute of Medicine recommended that they are included. The State of California has not made a decision. The question then is, where will yogurts fit in, and how do they balance nutrition and cost?

So this is now the composite, Nutrient-Rich Food Index applied to the WIC foods, and you see you have your skim evaporated milk over here, dried fruit, cereals, peanut butter, cheese, and this wide range of vegetables and fruit, but there are some juice drinks with added sugar, which do not score quite so well, they scored below zero.

So this is the new WIC package, and let me just conclude by showing you how the new WIC package relates to other foods and food supply scored according to this same method. Still the Nutrient-Rich Food score. These are the WIC foods, these are, of course, the vegetables and fruit included in WIC. You see where they are favorable

nutrient profile, low energy density. These are now meats, some of them do not score quite so well. Fish scored better. Some with high energy density is bacon. This is liver and organ meats. Here you have dairy products, again, a nice separation. Skim milk, 1% milk, 2% milk, whole milk, plain yogurt, and of course, the cheeses are over here with higher energy density. And of course, saturated fat and sodium content, there is very little you can do about that. Here you have cereals, including fortified cereals and sweetened cereals over here with a more negative score. And here you have the fats and sweets, all of them below the line, you can do nothing about those because they do contain either saturated fat or sugar or sodium, or in some cases, all three, and no beneficial nutrients. So this is a nice way, a kind of visual way, at looking at the new WIC package and seeing where the new foods will fit in.

And of course, there is a reason for showing you this because there is going to be, of course, a relation to cost. So for example, when you compare the previous foods, just go back here, the sweets and fats to the WIC foods, you see that the WIC foods actually will make a difference and they will have changed the nutrient profile of the food supply of the women, infants, and children in a positive direction.

So finally, let's us take a look at the cost issue. And this is going to be a problem where, again, nutrient profiling can help, perhaps in combination with linear programming of the kind just mentioned by Jean Luc Volatier. These are now prices from Seattle supermarkets. Energy-dense foods, which are energy-rich, but nutrients-poor, are cheaper. On the other hand, the more nutrient-rich foods, those that score higher on the Nutrient-Rich score, tend to be more expensive. But that does not necessarily apply to all foods. There are going to be gradations within each food group because you can go from fresh shellfish and fish to things like canned fish, and actually the WIC package does allow for canned sardines, mackerel, tuna, and salmon. You can have for dairy products, milk, and yogurt, and some cheeses. So there is going to be a whole range of food prices. Notice that each increment of the scale is a ten-fold difference, which means that the final WIC package will be chosen using both nutrition and cost, using methods much like this. These are now grains which tend to be less expensive. These are now vegetables and fruit. Notice that salad greens are expensive, but there are other vegetables and fruit that are not. Here are beans and here are nuts. Nuts are right now not part of the WIC package. Could be. There are ways of selecting foods for nutrient density and cost.

So to conclude, the new WIC package, by inclusion of vegetables and fruit, will improve the nutrient density of the diet, and I think nutrient profiling is one way to help states select WIC foods for inclusion, and this is a way of balancing the nutrient density of individual foods with preference and acceptability of those foods, and of course, the food costs. And much more work needs to be done on fitting this together in some kind of mathematical model, perhaps using linear programming or some other way of calculating the best foods for the price. That is for you an introduction

of how nutrient profiling can be used *directly* for consumer information in the service of public health in a way that really has nothing to do with food or nutrition labeling. It can be useful anyway. Thank you.

Q&A

PUBLIC: So if I understand well, you never take account the content of phytochemicals, beneficial phytochemicals, in the food. And fruits and vegetables are not equal in their nutritional quality, so this is not taken into account in this model?

A DREWNOWSKI: Actually we have not taken into account the phytochemicals because the databases are not good, and in designing our nutrient-density profile, we wanted to make sure that the databases were complete and also open source. Which means anybody who wants, should be able to download the nutrient composition dataset, and calculate the nutrient-density index at home if they so wish. So for example, all our calculations are based on the food and nutrition dietary dataset, set for dietary studies, which you can download from the Web from the USDA. So using open source data is very important to us, and phytochemicals are generally not included. Maybe later.

PUBLIC: In addition, as far as I know, we have no reference values for the intake of phytochemicals. And since the system is somewhere based *[laughs]* to use reference values.

A DREWNOWSKI: Right.

PUBLIC: It's in addition, a difficulty.

PUBLIC: Yes, just as matter of interest, I hadn't actually realized that infant formula is part of the WIC package.

A DREWNOWSKI: Yes. Why is that the case? Well, infant formulas had been part of the WIC package before and they will stay. There are going to be limits on the use of infant formula after the age of 6 months, and I may have had them there someplace, I can't remember. They are certainly fortified, so they will come out well. Just like the fortified cereals, you know, the score does what you ask it to do. So anything that's fortified will score well.

PUBLIC: Adam, it might be important to note that breast-feeding women will get more money per month.

A DREWNOWSKI: Yes.

PUBLIC: \$10 vouchers, I believe, if they breast-feed.

A DREWNOWSKI: Right.

A. MARTIN: Any more questions? Perhaps I have a question because perhaps I have missed something. I have not any headphones to capture the very good translations in French that we have, and thank you very much for the translations. And I apologize for my English. But I have not understood the clear answer to the question, is it not neutral as far as cost is concerned? The changes are neutral?

A DREWNOWSKI: Well, cost is not part of the score, but certainly--

A. MARTIN: But the new WIC package doesn't cost more than the previous one?

A DREWNOWSKI: Supposedly not, it's supposed to be cost-neutral, but as I say, each state has some discretion about what to allow. So for example, the \$6-8 per person is a figure from the State of Washington. I understand it will be similar in the State of California.

PUBLIC (Philipp JAMES): Rather than talking about the general issue, I just wonder, Adam, if you calculated on the basis of what you know about the cost which you have there. What quantity of fruit and vegetables could somebody actually buy for the \$6-8 per month? I've got no feel for that. In other words, does it remotely get anywhere near 400 grams a day per person?

A DREWNOWSKI: That's an excellent question; this has actually not been done. In fact, in doing this research, I was stunned to discover that nobody had applied nutrient profiling to the choice of WIC foods when the Institute of Medicine was doing the report. So we don't know at this point. So there are ways probably, of selecting the most nutrients you can for the \$6-8, but that requires the techniques that Jean-Luc described, and has not been done. The other issue is whether or not yogurts ought to be included, the issue was cost. They were recommended by Institute of Medicine, it has not been implemented, California is now doing a study whether or not yogurts will give you enough nutrients for the money, and would they be accepted by the consumer? Again, that has not been done. The new WIC package is going to be introduced in June of this year, so time is running short.

PUBLIC: But that, Chairman, automatically means that when you talk about cost, you are not really talking about consumer costs and so on.

A DREWNOWSKI: No. It's costs to the State.

PUBLIC: You are talking simply about how to manipulate the package.

A DREWNOWSKI: Yes.

PUBLIC: So that it satisfies Congress not costing more money.

A DREWNOWSKI: Yes, yes. So for example, California is spending, you know several hundred million dollars a year, this is what they got, and they will not be spending any more. They want to reallocate foods *within* the system in some way so it's cost-neutral. And the question is how to do that? In my opinion, these techniques allow more precise calculation than just guesswork.

PUBLIC: Actually, it's Elizabeth from United States. Just to answer this question, USDA released a study in 2004 showing that consumers could eat 5 servings a day on less than a dollar a day. Now, that doesn't account for the changes in cost for foods, but

A DREWNOWSKI: Well, yes.

PUBLIC: Okay [*laughs*].

A DREWNOWSKI: The USDA released a study, Elizabeth absolutely correct, suggesting that consumers could get 7 servings, or 6 servings, of fruits and vegetables for as little as 67 cents. But they based it on strange prices. What they did was to calculate the entire yearly outlay on, say, apples, \$1,800,000,000. And then they calculated the amount of apples produced divided by one billion eight and came up with, you know, 67 cents per pound. So this is not how you necessarily do that. They were using global statistics of the average cost.

PUBLIC: Yeah, the other point that they often mention with the WIC program in the United States is that it is a 'supplemental' food package, it's not meant to provide everything.

A DREWNOWSKI: Absolutely correct, supplemental food package, yes.

PUBLIC: Because, Chairman, what that actually means, if I understand it, on a manipulated mass cost basis, about 10 days fruit and vegetable equivalents per month. And therefore, it has to be a supplement.

A DREWNOWSKI: anyway, yes.

How to communicate nutrient profiles to the consumer? AFSSA point of view.

Ambroise MARTIN

Faculté de médecine de Lyon, France

So thank you, I have to stop this very interesting discussion and to introduce myself and apologize because I was requested to give a brief overview of the French Food Safety Agency system, and I discover only a few hours ago, that the general title was, “How to Communicate Nutrient Profile to the Consumer.” I remind you that in the regulation, theoretically, nutrient profiles are perfectly neutral, transparent for the consumers who will see only the result, if there is a claim or not on their product. But we have the chance to have a representative of a consumer association that is involved in the issue of nutrient profiles and perhaps he will give his advice more in line with the title...

The contribution of the French Food Safety Agency to the setting of nutrient profiles was prepared by a working group that I chaired the last year, and involving consumer representatives, which is not very usual in the French Food Safety Agency.

At the beginning of the work, we decided not to develop a nutrient profile system thinking that we have no time enough to do that and that there were already many systems on the market, if I can say. And we change our mind because we observed that we have in hand a system which was originally developed by Nicole Darmon to analyze the links between nutritional quality, food prices, and diet costs, and that this system could be adapted to the regulatory issue of claims. And also, since we were requested to answer the question laid down in the Regulation, the 5 questions about scoring, choice of nutrients, and so on, the questions that have already cited by Mike, we observed that in order not to have only a theoretical approach and to give a very theoretical answer, it could be useful to work on an actual system to give answers supported by some type of research.

This system is a system known as SAIN, which is a nutrition density score, the acronym is derived from French wording. It's an arithmetic mean of percent of the French recommended dietary allowances for qualifying nutrients for 100 kilocalories.

$$\text{SAIN} = \frac{\left(\frac{\text{Nut}_1}{\text{ANC}_1} + \frac{\text{Nut}_2}{\text{ANC}_2} + \dots + \frac{\text{Nut}_n}{\text{ANC}_n} \right)}{n} \times 100 \times 100$$

ED

y = number of qualifying nutrients

ED = energy density (kcal/100 g)

Nuti = quantity of nutrient i /100 g

ANCi = ANC of nutrient i for the general population (mean for male and female adults)

Nuti and ANCi are expressed in the same unit (g, mg or µg)



It's not necessary to develop the formula, of course, it appears to be complex, but with pocket computers it easy to perform now. It should not be a problem in practice.

The second dimension of the system is LIM, it is Limited Nutrient score, score based on 3 disqualifying nutrients which are calculated for a given quantity, 100 gram. So we have 2 reference bases, kilocalories for qualifying nutrients and grams for disqualifying nutrients.

$$LIM_n = \frac{\left(\frac{Nut'_1}{reco_1} + \frac{Nut'_2}{reco_2} + \dots + \frac{Nut'_n}{reco_n} \right) \times 100}{n} \times 100$$

n = number of disqualifying nutrients
Nut'i = quantity of nutrient i /100 g
Recoi : daily recommended quantity of nutrient i

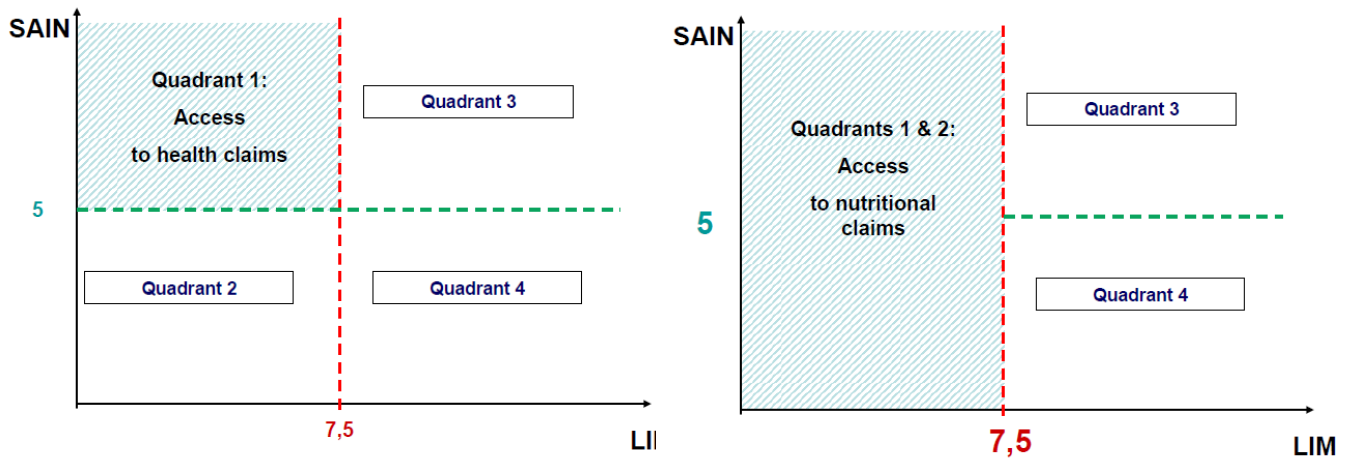
In the issue of the choices of nutrients, we tested many formulas, many different combinations, starting from 23 nutrients, and progressively reducing the number of nutrients in order to have a practical system, practical to implement in the real world. And finally we chose a formula containing 5 nutrients with the possibility of one optional nutrient. I come back later on that.

We also look for the relationship between the chosen nutrients and the other nutrients, and it appeared that the chosen nutrients displayed the best correlation with all the other nutrients, so that these proxy nutrients are really linked to the other nutrients which are not introduced in the model. The same thing was done for the LIM. We tested only, in this case, 2 different formulas, and chose the formula with 3 nutrients, sodium, saturated fats and added sugars. Dealing with the reference basis, the interesting point is the choice of 2 different reference bases, one for qualifying and the other for disqualifying nutrients, so that there is no compensation for nutrients, in contrast with other scoring systems using a single reference basis. Also, the advantage of an across-the-board system appears, from our experience, to be the easiness to justify the choice of the threshold for the score. And for example, for the optimal SAIN we considered that the optimal SAIN is 100% of the recommended dietary allowances for the general accepted number of 2000 kilocalories per day. So for one 100 kilocalories per day it leads to the adoption of a 5% of the RDA for 100 kilocalories. The same reasoning is made for the maximal LIM leading to the choice of the threshold value of 7.5% of the limit for 100 grams.

The result is four quadrant representation: because there is no compensation of qualifying nutrients and disqualifying nutrients, there is no need, like in the U.K. system, to add additional rule in order to discriminate between some foods, because the same result can be obtained with a food which is high in good nutrients and relatively high in bad nutrients, and a food which has no bad nutrients and a low level of good nutrients. And perhaps the nutritional interest is not the same.

The representation divides the food table in 4 quarters (1=high SAIN, low LIM; 2= Low SAIN, Low LIM; 3= High SAIN, High LIM; 4= Low SAIN, High LIM), and we

proposed that it's a choice, it can be contested or modified, that to be eligible to bear a claim, the food should be in the first quarter with a high SAIN and low LIM.



We also propose something different, which is not in the Regulation, but not prohibited by the Regulation, that we could be more generous for nutrition claims because promoting value, in term of selling, is less than health claim, and to accept all the foods which do not exceed the threshold for the LIM. In addition, it was interesting to demonstrate that a scoring system is perfectly compatible with the application of the derogation for nutrition claims which is in the Regulation. It was difficult to convince some of the members of the DG SANCO, for example, that it was possible to apply the derogation with a scoring system. It's perfectly clear from our experience and the same thing could be verified with the English system or any scoring system. It's very easy to apply the derogation.

The result of the SAIN-LIM system using the French Food database is presented on this slide. No time enough to comment on that, it's not very important because it depends on the specific composition of the database. And since an official database does not represent actual foods, it's not necessary to comment further.

Some points for discussion. The interest or the advantage of an across-the-board system, no categorization is needed, and Mike has made some comments on the difficulty of a priori categorization of all the foods present on the European market. The application of the derogation is possible and easy. And this system which is based, on one hand, on the nutrient density for the SAIN, and on, more or less, energy density for the LIM, take into accounts some very important ideas in the nutritionists' mind.

Also we observed that for ready-to-eat meals, for example, or composite dishes, there was a distribution in the 4 quarters around the thresholds, and we think that this fact highlights that some minor changes in the recipes of these composite dishes could allow for this food to move in the right quarter if it is the wish of the producer to bear a claim.

It's a tool which is obviously configurable. The choice of nutrients could be modified if we want, it could be modified, also, if there is a choice of a mixed system because the system is also compatible with a mixed system, across-the-board for all the food with specific derogations for specific categories. Also the references which are used could be adapted, we use French references, but of course, a population reference intake could be chosen. And so on.

The report has not yet been published, it will be published, I hope, within a few weeks or perhaps a few days, by the French Food Safety Agency (the report is available on the Afssa website ([www.afssa.fr/NUT-RA-profil\[1\].pdf](http://www.afssa.fr/NUT-RA-profil[1].pdf))). But since the report has been finished for the experts, we have continued to work, and specifically in the issue of validation, which is very important. And Nicole Darmon, in fact, has obtained very recent results that I want to show to you.

Linear programming is perhaps a tool which is underused in nutrition. It's a computer-based tool which, in theory, is very easy to use to answer to some questions. In order to achieve linear programming, we need 3 things. The first thing is a food database which contains what you want. Here, to answer to the first questions, the food database contains only the food eligible for health claim by the SAIN/LIM system. The second set of data you need is a set of constraints in order to obtain, in some way, a realistic diet. Thus we imposed nutritional constraints, the respect of the recommended dietary allowances, but also acceptability constraints, for example, portion sizes which have to be realistic. The third need is to define the objective function what you want, to minimize or to maximize, energy for example, while respecting the constraints. I show you the results about minimal and maximal achievable, but of course, if you have in your database, you have the prices, the cost of the food; you can minimize the prices and see if the diet can be achieved at a reasonable cost using foods eligible to bear claims. And the last step is to optimize: is it possible to fulfill all the constraints, and since the objective function is energy here, within which energy range?

So the first question was: *is it possible to fulfill nutrient needs by selecting only foods eligible to bear claims?* The second question was a reverse one: *is it possible to fulfill nutrient needs by selecting only foods not eligible to bear claims?* And only the foods in the database changes, nutritional constraints and the objective functions were the same. And the third question was: *is it possible to eat unhealthily, i.e. not respect the nutritional constraint by selecting only foods eligible to bear claims?* And so we change the nutritional constraint and introduced which could be considered as a nutritionist's nightmare, for example, we imposed to have a fat intake above 40% and so on. And the last question was: *is it possible to eat unhealthily by selecting only foods eligible to bear claims?*

So the answer to these different questions is: yes, for the first one; it's possible to build a well-balanced diet with a large energy range using only the food selected by the French system. And it is not possible, mathematically impossible, to fulfill nutrient needs by selecting the foods which are excluded by our system. Yes, it is possible to eat unhealthily by selecting only foods eligible to health claims, but within unrealistic energy range. And is it possible to eat unhealthily by selecting only foods not eligible to health claims? It opened a door which is already open, I think, but yes, it is possible within a large energy range.

So we propose that this tool could be used as a complementary tool to expert judgment and the method already developed and perhaps to other methods, to assess or to compare the results of the different systems. For example, if it is impossible for fulfill healthy constraints, the system should be too strict. In the reverse situation, if it's possible to fulfill unhealthy constraints within a realistic energy range, the system is not strict enough. And if we compare the energy range needed to fulfill healthy and unhealthy constraints, we can rank the different systems according to their degree of severity, so we can give to the managers some objective arguments in the choice of the final systems. Thank you very much, it was the last slide.

How to Communicate Nutrient Profiles to the Consumer?

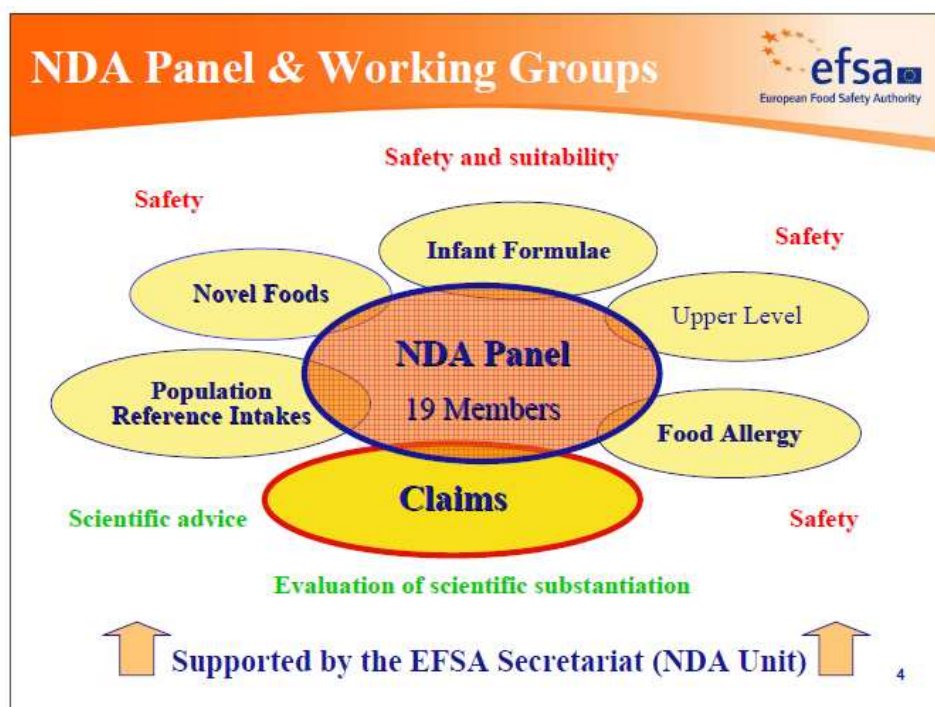
EFSA representative

Leng HENG

European Food Safety Authority (EFSA), Parma, Italy

Thank you very much. My presentation today is on the EFSA's opinion related to nutrient profiles. Let's start with a brief background of the Panel and the EFSA tasks in the framework of the regulation on claim, then I will focus on the opinion on profiles.

Among the [...] scientific panels of EFSA, it is the Panel on Dietetic Products, Nutrition and Allergies, the so-called NDA panel, which has been mandate to deliver the scientific opinions of EFSA in relation to human nutrition, also as on claims and profiles.



These are the tasks of EFSA in the framework of the claims regulation. EFSA was request by the Commission to provide scientific advice and technical support on nutrient profiles. EFSA has provided scientific and technical guidance for health claims applications, and last, but not least, it is EFSA has to evaluate scientific substantiation of claims.

Now moving on to the profiles. The question, are all foods allowed to bear a claim? The regulations set out conditions for the use of nutrition and health claim, and [to avoid] that health claim must be, overall, nutritional status of a food product and mislead the consumer--only foods which comply with a profile, might bear claims.



As specified in the regulation, in accepting the profile, the Commission has to request EFSA for scientific advice, focusing on a number of issues you are familiar with. And these profiles should be based on scientific knowledge on diet, nutrition, and their relation to health.

EFSA [...] its opinion late January 2008 after 2 stakeholder consultation events. I'd like to stress that the advice from EFSA focused only on the size and the [...] nutrient profiles. So here is some general principle. In this context, the purpose of nutrient profiling is solely for the regulation for the claims, not for communicating to consumers.

The nutrient profile in the overall diet is an important factor in determining health. The profile or balanced diet is defined by nutrient intake recommendations. The panel identified 3 scientific criteria that can be used by policymakers in deciding which foods are eligible to bear claims. The potential of food to adversely affect dietary balance is the main scientific consideration. This consideration relates, in particular, to nutrients for which there is evidence of a dietary imbalance in EU populations that might be related to overweight, obesity, and diet-related disease. That includes nutrients that might be consumed to excess, as well as [...] intakes might be inadequate. And the dietary role of different food groups and their contribution of nutrients to the overall diet of the population must also be taken into account.

These are the [...] food groups that play important dietary role and [...] in food-based dietary guidelines. Finally the nutrient profile should be consistent with food-based dietary guidelines established in Member States.

So the question now is which nutrients to be included? The choice should be driven by the public health important for EU population. This includes nutrients generally which do not comply with the intakes recommendations. Of course, not all nutrients would have to be included; otherwise, we will run into overly complex schemes. The Panel also recommends that some nutrients might not be needed, or could be include for select products. For instance, trans fatty acid might be include for some food groups. But they are decreasing public health importance as intakes are declining in the EU due to the product reformulations.

Which type of scheme? The Panel evaluates different options and considered a nutrient profile for food in general, except for limit number of foods group that play important dietary role, might overcome the main disadvantage of the across-the-board category-based scheme. For the use of different reference quantities, as well as for the choice of threshold values or scores, the Panel outlined the advantage and disadvantage, each. And recommend that the choice should be based on pragmatic consideration relate to the need of each scheme.

The regulation also required the testing of the model to be applied. For this, there is a need to apply the model to the selection of foods on the EU market. This required a database of energy and nutrient contents [...] foods as purchased. Then the question is, there is a need to evaluate the outcome, does the model classify foods in the same way as by expert judgment? The classification of foods for their eligibility to bear claims can be done by using the 3-sided criteria already outlined. In addition, all the nonscientific criteria must also be taken into account. For instance, the need to promote innovation, the feasibility, and the easy of use for this scheme to apply.

The panel also outlined scientific limitations of nutrient profiles. It is rather difficult to set at an EU level, then at national level. Owing to the lack of uniform data in the EU for food composition and food consumption, there are differences in nutrient recommendations, also in the food-based dietary guidelines among Member States. There are differences in dietary habits and [...] EU. It is also difficult to apply to, in EU foods, the nutrient recommendation established for the overall diet. And the nutrient content of foods as purchased can change during preparation and cooking.

Finally, there is no data at all regarding the habitual intakes and pattern of consumption of individual foods. So this limitation outside the need for expert judgment to be used in setting profile, and the basis for judgment, should be transparent.

So in addition to the scientific opinion delivered, EFSA continue to provide technical support to the Commission. EFSA has developed a tailor-made food composition database, compiling cooperation with Member States industry. The database include

over 500 different foods select from 20,000 food [...] food composition database from 6 Euro Member State. The setting of this [...] require dynamic process allowing for repeat feedback between the Commission and Member States. This data may be used for testing different nutrient profiles in EU provide by the Commission.

Now, to conclude, I would like to clarify some confusion about the [...] of EFSA. It is not for EFSA to decide on which nutrients to be included. The different quantity, threshold value score, the scheme to be implement, the sample food to be test, the criteria to be used, and the specific profiling system to be adopt, these are to be decide by the Commission and Member State. Based on EFSA opinion, and the technical support provide by EFSA, by January 2009 the Commission and Member State will establish specific profiles, including exemption and [...] views. That's my presentation, thank you very much.

As you can see, in the European Food Safety Agency experts have nothing to do *[laughs]* as compared with the National Food Safety Agency where they have built national systems. It's a joke, of course! *[laughs]* As indicated by Leng, we have a huge task with substantiation of claims that we are very pleased that we have not to develop a specific system.

I propose that we continue directly to the consumer reaction and perception, and question and comments, and so on, because it was a vital of the last part of this session. And I hope perhaps we will have some time to have a general discussion.

Ch. Pernin is an active member in French consumer associations, there are 19 or 18 consumer associations which are [...] in the national level. But not all are involved in the field of nutrition, and the "Confédération du logement et du cadre de vie", will give the English translation, perhaps, is very active in his field.

How to Communicate Nutrient Profiles to the Consumer Consumer's Association Representative

Charles PERNIN

Consommation Logement et Cadre de Vie (CLCV), Paris, France

Je vous prie de m'excuser, mais je vais m'exprimer en français. Je voudrais aussi m'excuser puisqu'à la différence des intervenants précédents, je ne parle pas anglais, je ne suis pas scientifique et je n'ai même pas de présentation, mais en revanche, j'essaierai d'être bref puisque j'ai cru comprendre que nous avions un horaire très serré.

Je voulais d'abord rappeler en quelques mots ce qu'est la CLCV. Nous sommes, comme le disait Ambroise, une des principales organisations de consommateurs en France et nous sommes bien sûr intéressés par toutes les questions ayant trait à la qualité de l'alimentation, nous sommes, par ailleurs, membre du BEUC qui est la Fédération Européenne des Associations de Consommateurs et nous avons donc travaillé sur cette question des profils.

Je voudrais aussi saluer la qualité des exposés scientifiques que nous avons eus aujourd'hui et je voudrais revenir d'abord brièvement sur le pourquoi de tout ce travail, pourquoi cette question des profils est-elle posée aujourd'hui au niveau européen ? Il faut bien le reconnaître, cet outil que sont les profils correspondait à la demande des associations de consommateurs françaises et européennes. Cet outil, comme vous le savez, a été défini pour permettre un meilleur encadrement des allégations nutritionnelles et de santé. Nos associations avaient en effet pu constater un certain nombre de dérives en matière de publicité et d'allégations nutritionnelles.

Ceci étant dit, ce qui me frappe, suite aux exposés auxquels nous venons d'assister, c'est que manifestement, il reste quand même dans la définition scientifique des profils un certain nombre d'incertitudes ou à tout le moins, une part d'arbitraire. On voit également qu'il y a une grande variété de systèmes, je crois que vous disiez que 38 ont été recensés. Et puis dans la logique même, dans l'approche même de cette évaluation de la qualité nutritionnelle, il y a des méthodes très différentes : avec ou sans seuils, par catégories ou sans catégories. Tout cela est finalement très riche, mais renvoie aussi un peu l'image qu'il n'y a peut-être pas encore, peut-être que cela viendra un jour, de certitudes absolues ou de consensus scientifique très ferme dans ce domaine. On l'a bien vu, ces systèmes seront finalement amenés à évoluer, à s'enrichir. La nutrition est une science où l'on en apprend apparemment tous les jours, on imagine même qu'un système défini aujourd'hui qui ferait consensus pourrait être amené à évoluer d'ici quelques années.

Ce constat nous amène finalement à une position, je dirais, de prudence quant à la question de savoir s'il faut communiquer ou non ces profils aux consommateurs. Faut-il communiquer ces profils aux consommateurs ? Je n'en suis pas absolument convaincu aujourd'hui pour les raisons que je viens d'évoquer.

Dans la définition des systèmes on a bien vu le rôle joué par l'EFSSA. Mais il y aura aussi des arbitrages presque politiques, qui relèveront en tous cas de la Commission Européenne. Pour l'instant, il nous semble que ce système devrait être utilisé dans l'objectif pour lequel il a été défini, c'est-à-dire l'encadrement des allégations nutritionnelles et de santé. On peut envisager à termes peut-être d'autres applications, par exemple, sur la publicité. En revanche, il ne nous paraît pas faisable d'envisager à brève échéance l'utilisation de ces profils pour un étiquetage et une information nutritionnelle. D'ailleurs on peut même s'interroger sur l'utilité pratique pour un consommateur d'une information de type « profil nutritionnel » sur un produit. En effet, si l'on a un profil nutritionnel transversal à toutes les catégories, c'est à dire un seul système qui couvre toute l'offre alimentaire, on risque d'avoir quelque chose qui va nous dire : finalement, les fruits et les légumes, c'est bon, vous pouvez y aller, en revanche, les barres chocolatées, il faut avoir une consommation plus modérée, il me semble que l'intérêt pratique est finalement assez limité, ce sont des recommandations que l'on peut avoir par ailleurs de façon beaucoup plus générale par une sensibilisation bien menée. Si l'on a un système par catégorie, c'était l'exemple qui nous était présenté auparavant, on va être amené à dire : entre la charlotte aux fraises et la charlotte au chocolat, il vaut mieux manger de la charlotte aux fraises. Mais je ne sais pas quel sera l'impact réel en termes de santé publique : on peut imaginer qu'il y ait des gens qui ne consomment au dessert plus que de la charlotte aux fraises et ce n'est peut-être pas aussi ce que l'on souhaite. Je pense que l'utilité pratique et l'impact en terme de comportement de consommateurs et en bénéfice reste à démontrer en ce qui concerne en tout cas une utilisation en tant qu'étiquetage nutritionnel.

Juste un point sur la question des fruits et légumes puisque c'était quand même le cadre général de ce sommet, d'une manière générale, pour les fruits et légumes la situation est assez simple puisque l'ensemble des systèmes sont conçus justement pour que les fruits et légumes puissent alléguer, en revanche, là où les profils nutritionnels pourront être très utiles, c'est pour peut-être encadrer la communication et la publicité qui se fait sur des produits transformés où il y a parfois un petit peu de fruits et légumes et où il y a, par contre, énormément de marketing et de publicité.

Je vous remercie.

Discussion

Pour rebondir sur ce que vient de dire M Pernin, le gros souci aujourd'hui justement pour favoriser une bonne consommation de fruits et légumes, ne serait-ce que d'abord en France, ce serait peut-être de penser à pouvoir mettre en allégation les fruits et légumes bruts, ce qui n'est pas le cas aujourd'hui et pourtant, on sait très bien que leurs valeurs nutritives et phyto-chimiques sont nettement les meilleures en produits bruts. C'est un premier point.

Le deuxième point, c'est effectivement de savoir que sur des produits élaborés – j'ai cru entendre tout à l'heure que dans le prochain process, il serait mis effectivement les plats élaborés et cuisinés ; on sait que les grosses multinationales aujourd'hui ensellent de façon très significative, pour des raisons de conservation ce type de plats, est-ce vraiment nécessaire de les induire dedans malgré, il doit être certain, une pression directe ou indirecte de ces multinationales et puis principalement de revenir sur les points de l'EFSA encore aujourd'hui, sur les allégations santé puisque l'on ait toujours repéré sur le fait qu'effectivement, on n'a pas de critères scientifiques qui nous affirment qu'un crucifère riche en antioxydant va quand même prévenir, je dis bien prévenir, dans une incertitude, c'est sûre, mais les radicaux libres, les effets carcinogènes qu'ils peuvent avoir, est-ce qu'il est envisagé par l' AFSSA et l'EFSA via ensuite la Commission Européenne d'élargir un petit peu les allégations rapportant bien sûr fonctionnelles et santé pour des produits bruts et élaborés. Bien sûr avec des vérifications qui se font de par les industriels, qu'ils soient nationaux ou régionaux. Aujourd'hui, je représente un énorme producteur européen de fruits et légumes, nous investissons des millions d'euros dans la recherche pour justement arriver à une consommation bien meilleure et on espère au-delà de l'Europe, néanmoins, on a aussi besoin d'avoir une « publicité », j'appellerai plutôt cela de l'information pour les consommateurs, je ne suis pas trop convaincu de l'effet de marquer les nutriments parce que je ne suis pas convaincu que le consommateur fait la différence aujourd'hui entre un lipide et autre chose et les lipides gras saturés, par contre d'avoir une allégation qui va dans le sens aujourd'hui pour le bien être de la santé des gens, je pense que l'on pourrait dynamiser correctement notre consommation de bons produits sains pour aujourd'hui et pour l'avenir.

Thank you very much for these comments. Would anyone like to comment?

...about profiles that you've seen, all the different profiling system that have been shown, like this LIM or other, show clearly that fruit and vegetables are high in the good sector of the composition that will then have a good profile. So I think on this-- about your question about the quality as a composition of, it [show] composition of different fruit and vegetables and transform product, you know that there is a very big NOR report that was published last year, we have extensive [...] review of that, so I think it could be a reference, also, to discuss this point. ///

For me, if I can have a comment. For me, nutrient profile is only a tool, as it has been already said. And the good effect can be expected only if it is integrated in a current nutrition policy, nutrition education, and nutrition information. By itself, we do not expect that they will solve all the health problems. Mike? ///

Yeah, I just wanted to point out. I think the session today has made it seem that there is lots of disagreement amongst societies. But actually, I think we are moving towards a greater position of consensus. And we do now have some very good models, which are well-validated models, and also we do have most of the models classified, in things like fruit and vegetables, in the same way. So I think we shouldn't be left after today's presentations with the feeling that we are not getting anywhere, in terms of nutrient profiling. It's all very complicated. I think we are making progress, and we are moving towards much more consensual positions in defining healthy and unhealthy foods. ///

May I comment? I agree with that. I would say that more commonality came across. For example, our negative component is exactly the same as Ambroise's component. And we are also using linear programming to use nutrient profiling as a tool within the broader context of preferences in consumer behavior. So I think this is where the future is going, it's going to be a tool, but one of many, integrated within a healthy diet. ///

So the issue of claims, claims substantiation is another issue. From the prospective nutrient profile, there is no problem with fruit and vegetables. About what could be said [...] [...], there are 2 aspects. The first one is generic claims which can be used by any food containing the nutrients. For the moment we cannot say what could be the result of the evaluations, because we have not yet received the consolidated list by the European Commission, so we are not sure what we will have to assess or to substantiate. You have the results of the evaluation of the joint Healthcare Initiative, you have the results of the French [...] [...] about some generic claims. For the moment you have to wait for June or September 2009 to have the result of the European Food Safety Authority. And to wait for January 2010 to have the final decision by the Commission about the generic claims. But if you have specific research, of course you have another possibility to have specific claims. And EFSA has released in July last year a guidance document. So this document can help you to design the [...] studies which are weighted by the experts in order to judge if a claim is substantiated or not. So the frame is very clear. And again, claims and profiles are only a specific tool for specific things. Of course, if there is a genuine nutrition policy to promote fruit and vegetables by funding, for example, for interventions in school programs, in school [...], so there are many other ways. And perhaps you are not very happy with all the results of the process, but I can assure you that many people in this field are not happy at all, because there are some, we are winners and some are

losers on specific points. Sometimes they are the same, so. *[laughs]* ///

I am surprised that given the variety of applications, your last comments are extremely important. I mean, we are doing things in the European context, Europe is the biggest exporter and importer of food, shouldn't we be thinking of this in a general way, applicable to foods globally? Because if you are involved in claims and trade, that seems to be fundamental. And I just wonder whether we are just being manipulated by the Commission, dominated by small sector interest, in only positive claims. When, as we've seen by the WIC program, you know, there is a completely different perspective that we could have. I'm also surprised that Mike talked about categories as though they were valid, all these pyramids and plates, and so on, presupposed advice to change categories. So surely, we have to dispense with all categories. I'm very intrigued by how benign you are to fundamentally ridiculous propositions. ///

[laughs] /// It's alright. *[laughs]* /// I think there is sort of an emerging consensus that a scheme which applies to all foods would be simplest and makes a lot of sense. The AFFSA scheme, the U.K. FSA scheme, essentially have across-the-board schemes. But it seems to me that the Commission, in this instance, is pushing for categories. I'm not sure on what basis, and you're right, I mean, on what basis are they defining these categories which Heng pointed out. I think they are moving in the wrong direction in that way, but people need to talk to the Commission and persuade it to have an across-the-board scheme like the AFSSA scheme or the FSA scheme. ///

Interestingly enough, the FDA serving sizes, to some extent, correspond to food categories because they take into account the huge difference in serving sizes in things like sugars, and oils, and desserts, and juices, and so on. So it actually, my position is, it might be easier to introduce serving sizes in Europe than to engage in a yearlong debate of what food categories really are, which could be unproductive and go on for far too long. So it would be easier to introduce serving food sizes. ///

Yes, but to define serving sizes at the European level with 27 Member States. For the moment, it has been [charged] that it is an impossible task. But perhaps *[laughs]* they could change their mind because there are many, many discussions between the different food suppliers and so on, the categories, to try to define portion size at the manufacturer levels, perhaps. But for the moment, we have not, and it has been no longer discussed by the EFSA Panel. ///

So I think we have to stop, unless the buses are not here. Are they here? The buses are already here? Probably. So thank you very much for these very interesting discussions and comments. And enjoy your cocktail. Thank you.

SESSION 20

INTERVENTION STUDIES TO INCREASE F&V CONSUMPTION IN DISADVANTAGED POPULATION IN DEVELOPED COUNTRIES

Chair: **S Hercberg**

- Nutrition interventions in low-income groups: dearth of research on effective interventions. **AS Anderson**
- Effect of a targeted subsidy on intake of F&V among low-income women in the special supplemental nutrition program for women, infants and children. **D Herman**
- Providing an economic supplement for fresh F&V purchase. **H Bihan**

Dearth of research on effective interventions

Annie S. ANDERSON

Centre for Public health Nutrition Research, University of Dundee, Dundee, Scotland, UK

Thank you very much for the invitation to speak on this very interesting title, “Nutrition Interventions in Low-Income Groups: Dearth of research on effective interventions.”

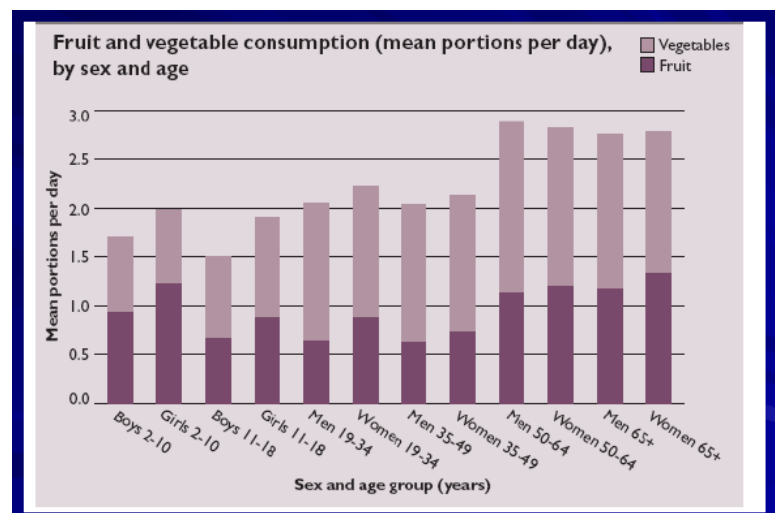
And what I’m going to do is reflect, firstly on the context of low-income groups, then look at issues that arise from diet interventions that have taken place in different settings. So I’m going to take quite a wide perspective on diet interventions. I’m going to reflect about some issues between research, practice, and policy, and that relationship. I’ll talk about recent systematic review on behavior change in low-income groups, and then finish with some comments on a wider research agenda.

So let us start about the context of diet and issues surrounding low-income groups, and this is within a U.K. context. We have a recent publication, The Low-Income Diet and Nutrition Survey, which is a representative sample of low-income and materially deprived households in the U.K. There are many things I could say about this Survey, many things have been said, and many things have been said by the U.K. government saying that perhaps there aren’t so many issues about low-income groups as originally we thought.

But I think there are some headlines that we need to take account of when we are designing diet interventions for this population. For example, 87% of women and 75% of men aged 50-64 have serum cholesterol levels above what is desirable, in terms of cardiovascular disease. So I don’t think we can ignore this risk factor in this population. In terms of body mass index, and this is data for women, 30% of our low-income group are in the overweight category, 33% in the obese category. So in terms of need, in terms of dietary interventions, the case isn’t hard to make.

When we look at the diet of these consumers, there are 2 major issues that can be flagged. One is that only 8% of men and 9% of women actually achieved the goal of 5-per-day, so there are some major challenges there.

And the other major difference in dietary intake between our group of low-income consumers and the



national population is intake of sugar. And we see a very notable social gradient. And this slide, if you look at the middle columns for men aged 19-64 in the low-income group on the dark bar, and the national population in the lighter bar; you can see that the low-income consumers eat considerably more sugar. So we have low fruits and vegetables, high sugar intake, and a range of risk factors associated with health.

Who are low-income consumers? We use one term to really describe a very diverse group within our community. They include lone parents, both mothers and fathers. They include unemployed, but also the employed. And I think it's very important to note that many of our low-income adults are in low paid short term jobs. They include manual works, they include pensioners. So we have a broad age spectrum within our communities. And they include ethnic minorities. So it isn't one population that we talk about when we say the "low intervention group."

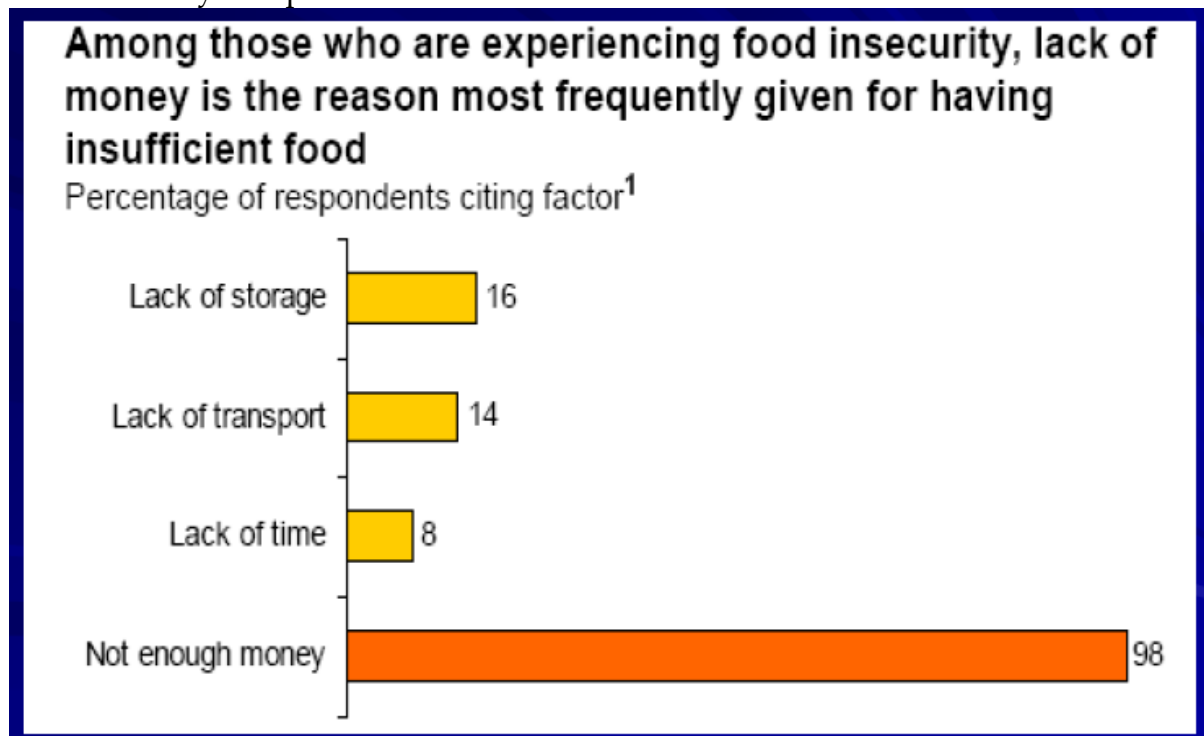
One other very striking finding about the Survey is this particular issue: limiting long term illness. By "limiting," it means limiting everyday activities, opportunities for work, leisure, and so on. 42%, that's almost half, in adults aged 45-54, claim report limiting long term illness. 60% in those aged over 55. This is a population who we are trying to intervene with who have circumstances that, actually, they are not very healthy, they are not very well. And that's both physical and mental health. And we need to take this into account, and this presents both challenges and opportunities for intervention settings.

Within the low-income group we can identify the poor and the poorest. So within the survey, 29% of the survey reported living in food-insecure households. And these are particularly women who are also able to demonstrate that women who lived in food-insecure households had a less healthy diet than those who were secure. It's harder to show this relationship for men, but it's clear for women. 39% reported that they were worried about food running out, and 36% reported they could not afford to eat balanced meals. So we have some very important considerations and concerns about trying to eat well in this vulnerable grouping.

Now, within this Survey there were a number of questions posed about issues about the relationship between money and food choice. So among those who were experiencing food insecurity, lack of money is the reason most frequently given for having insufficient food. And I think this graph depicts that very well. At the bottom line you have 98% of people saying they do not have enough money for food.

Respondents were also asked what factors they felt would facilitate the desire to changes in diet that they reported. Many people reported that they wanted, for example, to increase fruits and vegetables. And the overriding response was more money or reductions in price of food. There were other factors like individual

attitudes, like willpower, like self-discipline. And down at the bottom there, there were some factors like improving cooking skills, improving storage facilities. But let's not kid ourselves, at the top, the *strongest* factor that was presented was issues around money and price.



So let's put this together, in terms of summing up our starting point for interventions. We have a very diverse target group. There may be some very specific issues for women. They are diverse in their socioeconomic profile and their social characteristics. But there are people who are *very* poor, as well as being poor. These are people who are not well. There is unlikely to be one intervention that will fit the whole of our low-income community. Price is clearly an important issue in terms of personal budget. But there are other issues like support, like attitudes, self-discipline, and so on, which tells us that we perhaps need to think of both societal approaches and personal approaches. We need also to remember the wider aspects of food marketing that are likely to impact on these vulnerable communities. And finally, our governments would say the cost of interventions surely must be a major factor.

But when we think of costs of intervention, in particular on price, we need to balance that with the cost of ill health. And this is some data that was recently presented, in terms of restricting advertising to children. The impact of changing the increase of fruits and vegetables to 5 a day, reducing salt, cutting saturated fat, and what the impacts of that would be in terms of death avoided each year, and [...] affecting morbidity. So if we are going to talk about prices of interventions, these need to be balanced with the prices and costs of healthcare.

So let us turn now to a classical approach of how we might influence dietary

behavior. We think of micro environments working at the individual level, macro environments in a settings level, and also international environments. And let us start here with that wider, national environment. So in terms of what might impact on dietary choices, and this is dietary choices in the widest context here, we have to learn, I think, from work in tobacco. And we heard this morning about impacts of increasing tax on undesirable products. The tobacco work has certainly shown that young people and the poor are most responsive to price change. But actually, maybe we need to think of the other approach, which is lowering prices, lowering prices of fruits and vegetables, and what impact that much *wider* intervention would have on individual choice.

In terms of macro environments, we tend to think about community environments, and Phillip James mentioned this morning the North Karelia Project, the work in Finland. And this project, of course, which was initiated around over a 20-year period, was *very* interesting in terms of the effects both of fruits and vegetables, and the effects on mortality and morbidity. And we need to learn from that, but it's difficult to identify analysis by low-income groups. So there is an important issue about impacts on the *whole* of the population, and not just focusing on low-income communities.

Within the U.K., we've had a number of community-based interventions aimed at improving or reducing cardiovascular disease risk in different communities. These are some that have been undertaken over the years, Heartbeat Wales, Action Heart, Good Hearted Glasgow, Have a Heart Paisley, the latter two of which was undertaken in Scotland. And always the results of these studies say: it is very difficult to effect *major* change, so we are very ambitious about the risk factors that we try and change. There are complex interventions; it's very difficult to have good research design that allows us to compare the effect of our community group versus our control population, so we have a lot of contamination and overlap. And so many people feel that these sort of community studies, which have a lot of meaning and a lot of action at local community level, don't always produce the sort of research evidence that governments want to see, in terms of investing in health action and health promotion.

Focusing specifically on fruits and vegetables, we have our English Department of Health running a "5 A Day Program" which many of you will be familiar with. And the 5 A Day community initiatives are very much directed at local action within local communities. Very much bottom up work, which have been analyzed a lot, in terms of process. *Who gets the fruits and vegetables, how does it impact on knowledge, how does it impact on choice?* But not beyond that, what are the greater effects, in terms of hard health outcome measures? And it is always difficult when the relatively short term interventions are being carried out around fruits and vegetables and expecting to show hard health outcomes. So we need to be realistic about what our outcomes or

our impacts are, in terms of interventions.

Recently, we have seen a lot of work on retail initiatives around promotion and prices. We've recently undertaken some work with the Institute for Social Marketing at the University of Stirling, looking at direct marketing to low-income consumers. And this work was undertaken in conjunction with a major retailer in the U.K., the [Co-op] Supermarket. And within that database, it's relatively straightforward to identify low-income consumers because consumers have loyalty cards, and their background data on their household composition, and so on, is part of the data that the supermarket holds. We also wanted to target consumers who were main shoppers with that supermarket, and identify what we've deemed was "unhealthy" shoppers. And we had to identify certain food items that they selected on a regular basis which are generally high fat and high sugar items, as being people who were appropriate to target.

And our direct marketing meant that we sent leaflets, with quite significant money-off vouchers with recipes, which were aimed at increasing fruits and vegetables, and decreasing high fat milk and lower fat meat options. The recipes provided details of how to cook, for example, the lower fat meat *and* the importance of adding vegetables within recipes. The quite significant money-off vouchers, the level of voucher, was dictated or was informed by formative research with potential recipients.

And this intervention took place over one month to 45,000 consumers, so it was a significantly large intervention study. I'm not sure how well you can see all the changes here, but the intervention which took place over the month of May, when we look at the percentage intervention consumer base, we can see that during that month, for 4 of the products for which money-off vouchers were given, we did indeed *increase* the percentage of consumers purchasing those products.

Now, when I first looked at this data, I thought, ugh, it doesn't look very interesting, it doesn't look very significant, it's quite a small amount. The supermarkets, on the other hand, were hugely excited. Because it is really very important for them to get this sort of impact. And its good business and they think its worthwhile doing. So again, perhaps we need to learn about just how ambitious we are, perhaps, being with some of our interventions.

So the intervention did encourage purchase of the products, it increased the number of customers buying the healthy products. There is some switching from the high fat to the low fat product. But, of course, the effects were not sustained after the promotion ended. And here, of course, is a classical issue that we all have when we do intervention studies. Short term interventions, this is what our research always gets funded for. Where are the long term interventions that we need to be able to

demonstrate sustained effect?

So like any intervention, and that's true whether it's a drug or a community intervention, the intervention we can demonstrate is effective when it's there. If we remove it, it will not work. And that is very, very important.

Another retailer intervention that's being undertaken, this time in Scotland. It's not being undertaken by a research group. I came across this intervention on a Web search one day and also because I use my local shop. And it is part of the Scottish government's Healthy Living Program.

And the aim is to improve the supply of fresh products in neighborhood shops. So these are small, local shops, often in quite poor areas, and they are the sort of shops that people go to buy their bread and milk, perhaps not to do their major shopping. But we are hopeful, or the government is hopeful, that they may also pick up fruits and vegetables. And the type of work that's being done in these shops is to present, to market, the Healthy



Living Program with providing stands of fruits and vegetables, providing chilled cabinets to provide a *range* of fruit and vegetables that *look* attractive, that the consumer meets as *soon* as they walk in the door, and even *before* they walk in the door. And to be honest, it's often the most exciting thing *in* some of these shops.

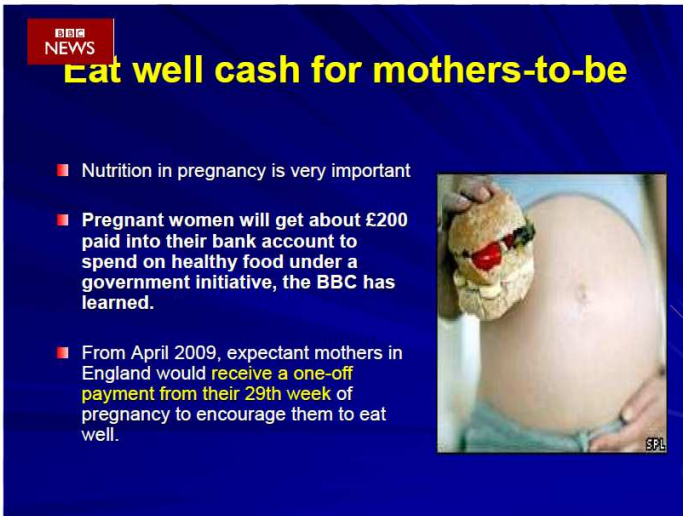
And a whole lot of initiatives went along with these promotions. A free piece of fruit every time a non-sugared drink was bought. A free fruit for every child accompanying a parent. Spend 2 pounds and receive a free piece of fruit. Now, the retailers, by their own admission, are not doing this primarily because they are interested in health. They want to increase their profits. The fruit here is not cheap. They want people to buy it. And it's marketed well. And this initiative has brought in business development managers, and tackled a lot of stores in deprived areas. They've also brought in store champions, and these store champions are somebody that can talk to the consumers, be friendly, and be part of the shop, quite different from what you find in national retailers.

And this is the sort of data that's available from that Initiative. And it's the percentage of sales increase for juice, yogurts, and a whole range of other products, as well. They have also done fresh fruits and vegetables, but I wasn't able to access the data. But they are very pleased, because retailers have found that they can market

these products, consumers will purchase more fruits and vegetables, and that includes low-income consumers, but they still make their profits. And there is an issue there about how, in fact, that can be incorporated with some sort of budgeting component, as well. But it reminds us that marketing is very powerful. Marketing can be used for positive purposes.


Okay and then turning to micro environments. And this is usually where most of our, perhaps, our intervention research will be found. And this is very much tackled at the individual - a lot of it is focused on women and children. And in the U.K., we have something called the Healthy Start Program which displaced our welfare foods program, and it's just started running over the last year. So pregnant women and children in the first 4 years of life, it offers coupons for women who are eligible for this program, and it is means-tested. So it is really targets the very poor, and any pregnant woman who is under the age of 18, so women must already be claiming social benefits to get on to this program. The vouchers that are available have just gone up to something like 3 pounds per week for milk, fresh fruits and vegetables, and for vitamin supplements. Now, this seems, on the surface, like a very worthwhile program. But when we look at research, we don't know what kind of effect this program will have. No baseline work has been done prior to the implementation of this program. And now, the Department of Health is trying to put some sort of research in, but it will be process, it will not be effect. So many of us who are working hard on research and trying to get an evidence-base, feel slightly frustrated that we have a government program that doesn't, perhaps, take account of effective evidence, and certainly optimal approaches, particularly around the cost of vouchers that's being provided.

And more recently, the English government also announced a special cash allowance



BBC NEWS
eat well cash for mothers-to-be

- Nutrition in pregnancy is very important
- Pregnant women will get about £200 paid into their bank account to spend on healthy food under a government initiative, the BBC has learned.
- From April 2009, expectant mothers in England would receive a one-off payment from their 29th week of pregnancy to encourage them to eat well.



for pregnant women who will get 200 pounds paid into their bank account, supposedly to spend on health food under a government initiative. And this, on the surface, sounds very good. It's going to be available for all women. But it doesn't come with any involvement of food. It is a check into the bank. So how does that affect? Where is the joined-up thinking there, in terms of trying to make some sort of effect and

help the whole issue of trying to improve nutrition?


And I think this contrasts with the Women, Infant, and Children's program in the

U.S., which I think we will hear more about later, both in terms of the range of foods that WIC provides or women have an opportunity to have, as well as the sum of money or vouchers that's related. Also in the U.S. we have the expanded "Food and Nutrition Education Program" which ties in an educational approach and builds on skills development. Again, something that we don't see in the U.K. We do, of course, see a lot of small scale community interventions around food skills development. This is one study that our group undertook a few years ago on the development and evaluation of a nutrition education for pregnant teenage women. These are a very, very vulnerable group. The city that I live in Scotland is the highest teenage pregnancy rate in the U.K., probably in Europe. And we were able to identify in a very short period, 120 young women who were eligible for a study of cooking skills, where we invited them in to eat, to cook, to bring their partners, their parents, and to also receive free food gifts. Of the 120 women we invited, only 16 were interested. So we think it's a wonderful idea, we think food skills are really, really important. These women have more important priorities in their lives. So we can think of many interventions, but we need to make sure that they actually relate to where people are at.

We also have a lot of schools initiatives going on in Scotland. For example, we have a free school meals scheme which has just been initiated as a pilot. And this has been rolled out for all children in primary schools in certain areas in Scotland, recognizing that the free school meals initiative that currently exists is only for poor children. So what happens if you take away that stigma and offer all children free school meals? We also have free fruit, we have milk, and we have mains-fed water coolers in schools, so we've lots of school work going on. What we don't have is research going on to show what the impact of that will be. And that raises this very thorny issue of that relationship between research and policy.

Schools Initiative

- Schools begin **free meals** scheme
 - Primary pupils are starting to receive free school meals as part of a pilot project in five parts of Scotland.
- The Scottish Government has invested £5m in the pilot scheme, with about 8,500 additional pupils expected to take up the offer in Glasgow alone.
- The city already has free fruit, milk and mains-fed water coolers in its schools.



When we look at our academic texts, in terms of recommendations for community-based diet interventions, and this is returning again to the issue of women, we know that we should conduct qualitative research to determine what women would like to have, we should tailor programs to women's stage of life readiness to change, to specifics of groups rather than just a wide group. And that we also need to evaluate

policy and the environmental interventions. And this sounds like good common sense to a research community, but somehow it doesn't quite translate into what actually happens in practice.

Another study of cooking skills I'm going to talk about, which demonstrates another issue about undertaking research in vulnerable communities. A few years ago, we undertook a cooking skills project called the "Cook Well Project." You may, of course, have noticed that the direct marketing project we talked about was Buy Well. We like to add "well" and positive messages to our interventions. This project worked with existing community groups, people who were already coming to community centers, sometimes for literacy classes, sometimes for mother and toddler groups. But they existed as a group and we offered cooking skills programs. There was interest in these programs being taken up. 93 participants in settings from across the country completed 50 7-day food diaries at 2 time points. The 3rd time point, with a further dropout of 40. The sort of impact, this cooking skills project had, and I'd really like you to notice the scales here, in terms of mean portions per week. And this is our intervention group. And we are talking in terms of fruit, about at Time 1, less than 2 portions per week - this is not per day - and the impact that our cooking skills intervention, which ran for 6 weeks, had. And really, the only significant impact was, in fact, on vegetables and salad, which went up slightly from 6 portions per week to about 7 portions. So the challenge is fairly significant.

However, there are other aspects of community interventions that emerge, including issues around confidence, including issues around self-efficacy. And when we look only at cooking skills, or when we look only at dietary intake, it doesn't really capture the whole impact of our community interventions. And these sorts of outcomes are things that we might be able to build on, to be able to *retain* our intervention groups. And there are big issues around data collection and undertaking research within low-income groups, and this is from our own findings, in terms of our studies and also from the low-income diet and nutrition study. We have issues about low literacy and numeracy, English is not a first language for many people. There is often domestic chaos at undertaking surveys, we have to write everything down after it's consumed, is fairly challenging. We mentioned health before. Higher levels of obesity, higher levels of under-reporting. And really, we don't have much information about some of our most vulnerable group.

We mentioned that many people in low-income groups are unwell, and so why don't we have a health services approach to dietary interventions? Isn't this an appropriate setting, because many people will visit the primary care practitioners? We know in the U.S. that there have been various programs trying to tie in, for example, screening and interventions with some indications of important impacts on cardiovascular disease risk. And we know there are challenges around integrating clinical and lifestyle intervention, not least because our clinical colleagues are not

terribly skilled in lifestyle interventions.

But, I would like to focus on one intervention which is of interest. It's on fruits and vegetables, it is behavioral counseling to increase consumption of fruit and vegetables in low-income adults, a randomized trial undertaken by Andrew Steptoe and his colleagues in London, published in the British Medical Journal. It had all the designs for a classic trial. I use this paper quite a lot for teaching my students. An intervention group with brief counseling focusing on good theories of behavioral change, social learning, stages of change, tailored to the individual, personalized specific advice, 15-minute individual consultation versus nutrition counseling. A very brief intervention. The impact of the behavioral counseling demonstrated that the in low-income adults as significant increase in fruits and vegetables were possible. And this study didn't just look at reported intake, but also biomarkers. And the conclusion was that this brief individual counseling and primary care can elicit sustainable increases - this study was carried out over a year - in consumption of fruits and vegetables in low-income adults, at a level that would be clinically relevant. Is this research used in clinical practice? Has it been transferred out to our practice community? No. So there are real issues about research dissemination, even if we have effective interventions.

Now, I am going to wind up with just a last couple of slides. I recently came across a systematic review of low-income groups and behavior change interventions, published in the last month. 9,725 references were found, and the number actually included in the review was 13. And this isn't just healthy eating; this is smoking cessation, healthy eating, physical activity, and interventions that covered more than one behavior. So if my title was "Dearth of Research on Effective Interventions," probably these slides say it all. And at some point, people have probably got to say, if this is all that can be collected, what can we really say? But of course, people that are paid to do reviews like this, don't stop work if little is found. They say, well, what have we got from these small numbers of interventions, not all of which were effective? Well, it looks like intervention techniques in low-income groups that are most frequently used and found to be effective are "providing information" and encouraging "people to set goals". So that's the current evidence base from our behavioral research. However, I think many of us would argue whether that these do not provide the final or indeed only approach that might be utilized.

In conclusion, I think interventions need to look at both societal approaches and personal approaches. We need to listen to our low-income groups who say money is important, in terms of intervention. We need to understand something about 'promising' interventions, and not rely solely on our systematic reviews to inform evidence. We need to think about the length of interventions, about sustaining intervention effect, the sort of measures that we use in research, and fundamentally, that relationship between research and practice. Thank you.

Effect of a targeted subsidy on intake of F&V among low-income Women in the Special Supplemental Nutrition Program for Women, Infants and Children

Dena HERMAN

Nutriline, USA

Mesdames et Messieurs,

Je voudrais d'abord remercier les organisateurs de l'invitation et je suis enchantée d'être ici parmi vous et de pouvoir vous présenter les résultats de mes recherches. Cette conférence est un événement important et passionnant et c'est un honneur d'être ici entourée de personnes compétentes.

Okay, that's the end of my French. I will spare you any more. I'm here to talk to you today about an intervention project within the United States with "WIC participants" who are defined by the program as being, low-income or 185% of the U.S. federal poverty limit. I'm going to divide this presentation into 2 parts. First, I'm going to start with the research and our intervention project to increase fruit and vegetable intake, and then move to the policy piece of this, because this is, an intervention project which became a policy that is now being enacted in the United States. So I will divide this presentation into those 2 parts.

First of all, I'm not sure how many people in this room understand what the "WIC program" is, so I'd like to give you a brief background on what it does and who it does that for. It is a Special Supplemental Nutrition Program for Women, Infants, and Children, that is the formal name of the "WIC program." So it covers women from pregnancy into lactation, and all children up to the age of 5. It is an income-based program, a means-tested program, meaning entry into the program is determined, by your income level, 185% of the poverty limit in the U.S. Then you need to be in one of these critical groups of development pregnant or postpartum woman, infant, or child under the age of 5 years.

The Program provides special foods, high quality foods, to target pregnancy outcomes, in particular. The nutrients targeted as part of the food package are vitamins A, C, iron, calcium, and protein. This was based on a program that started, in the early 70's, and whose purpose was to reduce rates of both anemia and low birth weight. To that end, very particular foods are in this package. They are milk, eggs, cheese, dried beans or peanut butter, fortified cereals, and juice. The packages for pregnant women are approximately worth \$55-60 US dollars.

Unfortunately, since the 70's, the food package has not changed, and that has been 34 years in coming. We haven't been waiting quite that long, but almost, to change the

food package. So I'm going to go ahead now with some of the explanation of this study.

We conducted this project for a number of reasons. One, an Institute of Medicine review of the WIC food package was being conducted, looking at the scientific basis for the foods that were included in the package, and the desire from the public health community to bring the package into alignment with the dietary guidelines. In addition, of course as I think everyone knows in the U.S. we are some of the fattest people. So the obesity epidemic and health consequences for obesity were another consideration for trying to get fruits and vegetables into the package. Finally, to evaluate the impact of providing an economic incentive to this low-income population, we provided money to people to increase access to fruits and vegetables.

These are the locations of the 2 intervention sites; they are in Los Angeles, and represent the largest WIC program in the United States. This Program serves 318,000 women a month, so quite a few people. These sites are relatively close, if anyone has been to the LAX Airport, Culver City is about 12 miles north, and Gardena is about 12-15 miles south, so in a pretty proximal area. One of these sites was a farmer's market, Culver City. The other was a supermarket chain in Gardena. And if you imagine, way up in the right-hand corner, that was our control clinic, in a place called Pomona which is very close to Riverside County, so out of the L.A. County area.

What we did was provide an economic incentive to increase fruit and vegetable intake. That incentive was worth \$10. A \$10 voucher was given per week to purchase fresh fruits and vegetables only. We carried that intervention out for 6 months. So that each family participating - and there were 200 at each of the 3 sites - received \$240 for the entire intervention period. As I mentioned, one of the intervention sites was a supermarket, while the other was a farmer's market. We had 400 intervention families, and 200 control families participating. We followed them for a total of approximately 14 months. We had interviews conducted at recruitment, 2 months following recruitment to track baseline intake, at the completion of the intervention which was 6 months, and then an additional 6 months without any intervention to see if the fruits and vegetables consumption had somehow changed.

The eligibility criteria for the study were post-partum WIC participants who had just delivered within the last 2 months. They had to be at least 18 years of age, and English- or Spanish-speaking. Here are the demographic characteristics of the population. The most important facts are that they are of child-bearing age, on average about 27 years old, education is 9 years, income is roughly \$1200 a month, and the family size about 4 people. Overwhelmingly, this population was Hispanic. But there were other ethnicities involved.

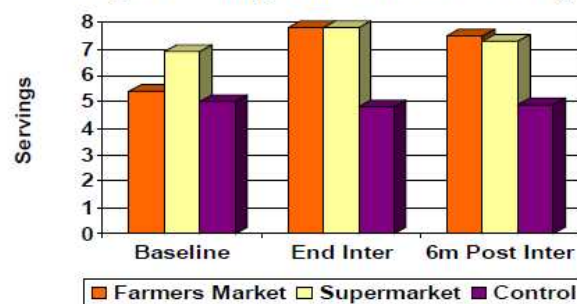
This voucher was redeemed at an incredibly high level, 88% in both the farmer's market and supermarket settings. This is highly unusual, if you speak to retailers. Usually a manufacturer's coupon is redeemed in the very best situation at about 20%. So when they saw 88%, they almost fell out of their chairs. It was quite impressive to them.

Participants purchased a very wide variety of fruits and vegetables, whether in the farmer's market site or the supermarket's site. I'm going to show you 2 lists now of first fruits, and then vegetables purchased by WIC participants. They ranged from bananas to papayas and melons, and every season really is encompassed here in this list. It wasn't just that they bought bananas and apples all year long; they really did purchase an incredibly wide variety. For vegetables, it's truly the same case. Carrots, tomatoes, obviously, you know, good sources of vitamin A and other nice phytonutrients, all the way down to very cultural items like chayote which is basically a pear-shaped vegetables, almost like a squash, it's very common in the Hispanic culture, to make a salad. I think you call it here, "choux choux." So a very wide variety of vegetables, as well. This is just to give you a little bit of an idea of the wide variety, but the fruits and vegetables were also very nutrient-dense. The nutrients that were targeted in the report set out by the IOM were increasing vitamins A, C, fiber, and potassium, nutrients seen as lacking in these very vulnerable populations during critical periods of development. And you can see from this list, the checkmark indicates a good or high source of that nutrient, that we had a very, very good representation for, actually, all of these nutrients, from many sources.

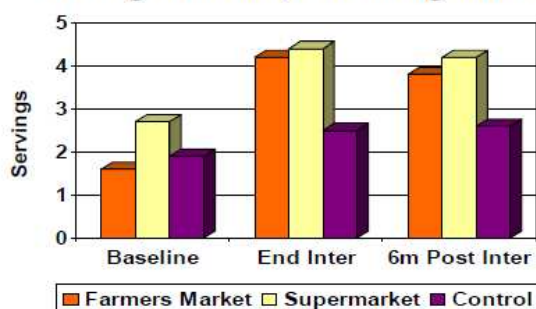
These are just the results that were brought out now in January of this year in the American Journal of Public Health, these are the final results. They show that there was an increase in fruits and vegetables from the baseline, beginning of the study, all the way to 6 months post-intervention. Meaning, that even though the economic incentive was taken away, these participants actually made a change in their eating habits and decided to carry out their own - they made some change in their spending patterns and consuming patterns. How do we know this? You are probably asking how these data come about. We did very intensive quantitative 24-hour recalls, 4 times throughout the period. So we have mountains of data, but we can tell you this fairly confidently that these are what the data look like.

Increase in Fruit and Vegetable Intake Sustained

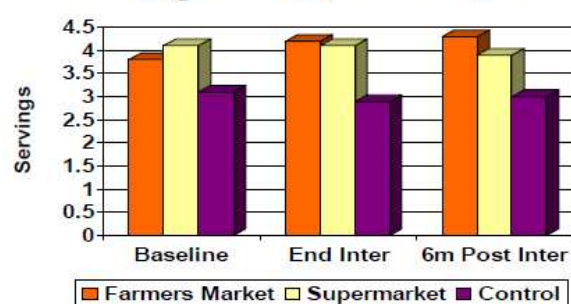
Average Consumption of Fruits and Vegetables



Average Consumption of Vegetables



Average Consumption of Fruits



In the end, the increases in fruits and vegetables intake were relative to one serving of fruits and vegetables, one portion, per 1000 calories or 4,186 kilo-joules. Most people eat more than 1000 calories, so 2 servings for over 8,000 kilo-joules, which is really quite a nice increase, sustained increase, over the period of the study. You notice that the other 2 graphs below refer back to consumption of vegetables and fruits separately. I think the even more exciting part of this, because we heard so much at this conference how difficult it is to increase vegetable intake, the increases were actually realized primarily in the area of vegetables. So this was also another very nice outcome for us.

In conclusion, fruits and vegetables vouchers were successfully used. They increased fruits and vegetables intake of the participants, they increased the consumption of key nutrients such as vitamins A, C, fiber, and potassium, and participants purchased a very wide variety of fresh fruits and vegetables. We also demonstrated feasibility in supermarkets, and farmer's markets. So really, the study was able to confirm that providing economic incentives of fruits and vegetables vouchers will increase the purchase *and* consumption of a wide variety of nutrient-dense fruits and vegetables among low-income women and their families and this worked both in the supermarket and farmer's market settings.

Research Conclusions

Fruit & Vegetable Vouchers were used successfully to:

- Increase fruit and vegetable intake of WIC participants
- Increase consumption of key nutrients such as:
Vitamins A, C, fiber and potassium
- Purchase a wide variety of fresh fruits and vegetables
- Demonstrate feasibility in supermarkets

✓ This project confirms that providing F/V vouchers will increase purchase and consumption of a wide variety of nutrient dense fresh fruits and vegetables among low income women and their families and works in both supermarkets and farmers markets.

So I'm just going to very briefly explain a couple more results because these really added to the mix. I'm going to talk to you more about policy. There are actually 2 more studies that followed on to this; one took place at the same time, the one in Calaveras County. Calaveras County is in the very north of California, and is a very rural community; we were in primarily in an urban setting. I didn't find out about this project, actually, until I had completely completed mine and found my colleague as we testified for the US Congress in Washington, D.C. They had a program very similar to ours, except it was a \$5 voucher and carried out for 5 years. Participants also purchased a wide variety of fruits and vegetables with fruit and vegetable vouchers. They increased their consumption of fruits and vegetables, they somehow, miraculously, had the exact same redemption rate as us, 88%. They purchased primarily the fruits for snacks and the vegetables for dinner, and besides what we showed, they were also able to show that it worked well in a variety of settings, so not only the supermarkets. They only had one supermarket near the clinic where this was administered out of, and it was quite far for them. But they also were able to show this in small, independent markets and mom and pop type stores, so your corner, kind of, store here, was very successful in those settings. And in terms of New York State, they modeled a project based on our 2 studies, and also had equally similar results.

So moving on now to more of the policy piece of this presentation. As I mentioned early on, these projects were based, really, on the IOM report which came out in April 2005. And this report recommended changes to the food packages. These changes had been desired by the public health community for quite some time, but putting the pencil to paper and an authoritative body of scientists saying that, and

trying to bring the food package into compliance with the Dietary Guidelines, was their goal. They recommended their changes only based on current science, and those changes were to reduce milk, cheese, eggs, and juice, include vouchers for purchase of fruits and vegetables for all age categories - they actually recommended the \$10 voucher per person per month. Their mandate, however, was to maintain cost neutrality, so they did have to cut some things out of the food package that were currently there, and replace those with fruits and vegetables. And the data from the current study were actually used to testify to support these recommended changes.

We faced a number of barriers trying to get these results to help move policy changes, to take research into action. The USDA officials and legislators did not want to believe that moms would even use these vouchers. It was money, how they would do the right thing, that they could buy nutrient-dense fruits and vegetables, to actually make those decisions for themselves, and to increase their fruit and vegetable consumption. They were all highly doubtful. There was also the concern that fruit and vegetable vouchers would be cumbersome at checkout. So we had many hills to climb.

But we superseded in the end. Thanks to a lot of people. These results influenced national policy. We had many briefings with the U.S. Congress and with USDA, both the officials, as well as the people who work within USDA. We had briefings with policymakers at USDA and also with the WIC division staff at the U.S. Department of Agriculture.

I have to say one more thing, going back to this. None of that would have been possible without the National WIC Association and Lorelei DiSogra here in the front seat. United Fresh got us there together with the legislatures and helped them actually see that these barriers could be overcome. Here is a photo of me next to Eric Bost, who was the Undersecretary for USDA at the time. Shirley Runnings, who is next to me, is the representative from Calaveras County. And Lorelei DiSogra is there in the red jacket. So we are all truly there, this is not - because I live in Los Angeles, this wasn't taken out of a film, it truly happened.

Results Influence National Policy

- Briefings with U.S. Congress
- Briefing with Policy Makers at U.S. Department of Agriculture
- Briefing with WIC Division Staff at U.S. Department of Agriculture



Lorelei carried this out, both before and after we came to D.C., but the results were relentlessly marketed. The 5 key messages that were brought to the legislators and other people, who needed to be informed, were that low-income moms valued these vouchers and redeemed them at very high

rates. They purchased a wide variety of nutrient-dense fruits and vegetables. They increased their consumption of fruits and vegetables and sustained it over the time. The vouchers were easy to use. Retailers loved these things, the supermarkets who participated trained all their personnel and they had basically no events, any problems whatsoever redeeming these. And the vouchers worked at the farmer's market, as well. There was no problem in getting them out.

So today, 34 years later, the WIC food package will now include fresh fruits and vegetables. It really is the single most fundamental change to the revisions of the WIC food packages, and ensures that women, infants, and children can buy a wide variety of fruits and vegetables. And for the infants, they are also encouraging fruits and vegetables from a very young age by providing baby food fruits and vegetables, so they can get acquire the taste, from early to encourage intake of fruits and vegetables.

WIC Policy Today

- After 34 years... WIC will now include fresh fruits and vegetables.
- The single most fundamental change to the revised WIC Food Packages is the inclusion of a wide variety of fruits and vegetables... from fresh produce for women and children... to baby food fruits and vegetables for infants.
- WIC Moms and Children will receive Monthly Vouchers for Fruits and Vegetables:
 - Moms: \$8/mo
 - Children: \$6/mo
 - Breastfeeding Moms: \$10/mo

The monthly vouchers for this program will be implemented as follows: pregnant mothers will get \$8 per month, children \$6 per month, and breast-feeding moms \$10 per month. That perhaps doesn't seem like a lot, but realize that most families have, perhaps, 2 people on the program, so it does really contribute quite a bit to their ability to purchase fruits and vegetables.

So the exciting part. This is going to improve health, the health of 8 and a half million WIC mothers, infants, and children. WIC moms will have more than \$500 million per year nationwide to buy produce to improve their public health. And it's going to improve access to fruits and vegetables, especially for low-income communities in inner cities, and in remote areas.

I'm going to speak just for a minute now back to Calaveras County to show you that the advent of these vouchers was not only good for the participants, themselves, but it actually caused community transformation, and was a great source of social justice. In Calaveras County, as I mentioned, they got a voucher for \$5 monthly and it was carried out for 5 years. It did result in increase of availability and variety of fresh fruits and vegetables for sale in small markets. And this was quite remarkable because many of these tiny stores had no refrigeration and carried only potatoes and onions to begin with when this program first began. But after the vouchers were in

the store for awhile, these small stores increased their variety to include over 25 fresh fruits and vegetables. This increased access benefited the WIC families, but also the entire community because everyone shops at these small markets. So WIC was actually had a large part in that, because it increased access for everyone in the area. This shows that these WIC fruits and vegetables vouchers have the potential to transform access in inner cities and rural areas.

So, in conclusion, this small study in Los Angeles will actually have global implications. We are going to be able to offer fruits and vegetables vouchers to low-income families, and that should result in their increasing their fruit and vegetables consumption, improving their health, reduce the risk of obesity, and improve access to fruits and vegetables in these communities. As a final note, I want to just let you know that there are many nutrition programs in the U.S. This has also affected the ability to increase our funds for evaluating other programs, because there has just been so much goodwill behind this program, and the fact that there were real results that were achieved. So as an example, the food stamp program, which is a program that serves far more people in the U.S., will now have \$20 million available to actually start an evaluation of that program to see how it can be improved. Thank you.

Q&A

S HERCBERG: Merci beaucoup Dena pour cette présentation extrêmement intéressante présentant des résultats spectaculaires et encourageants. Félicitations. Nous avons le temps pour quelques questions.

PUBLIC: I just have a very brief question which is, it was a fantastic presentation, a very positive message. What would be interesting to hear would be: how the vouchers were redeemed, was this an easy process? And did any of the shopkeepers rebel, you know, were they negative about it?

D HERMAN: Well, thank goodness I've answered this question a number of times, as it is one of the most common questions we have had to answer. It was very nice; actually, that no one rebelled. For the farmer's market, we had to work with the entire City of Culver City because it's a city action to put on a farmer's market, so I had multiple members of city government help us collect the money. What happens is there is a market manager, and the market manager pays the farmers, they turn in the coupons each market, and pay them, then the market manager goes back to the City, and had the vouchers counted again - they just had someone do this for us - just to verify the amounts were correct, and they'd send the coupons back to us. It was done completely out of goodwill, we did not pay them anything. And it went exquisite, it just worked incredibly well. And for the farmers, of course, it was great.

About \$45,000 additional dollars came to them in 6 months. They were ecstatic. For the supermarket, we worked with a corporate headquarters in Los Angeles. It's a very large food chain; it's called Kroger's or Ralph's. And also we had a lot of support from them because \$500 million, who doesn't want a piece of that pie? They were looking ahead. They thought this was going to work. For the supermarket, they also had before their eyes the fact that in the product department, they are going to have less shrink, so they will actually profit from that. And also getting more people into the supermarket is going to give them additional incremental sales. So they were very happy with those ideas to begin with, and then they also went out of their way to train all their personnel in the stores that we used. They collected our vouchers and anything that we did not redeem, that other 12%, because we had to pay up front, they gave back to us. And they gave us electronic reports, and there was not one incident at the checkout which you might think would happen. The participants were given instructions to use the \$10, they weren't allowed to buy less, but they could buy more. The participants had to be taught how to use the vouchers, buy 5 pounds of oranges and whatever else. They had to think about things so they could go quickly through the line, because they didn't want anything hindering that process, and there was nothing. It went very well.

PUBLIC (Bill [...] from Los Angeles). I think you might have answered one of my questions. It sounds like it was Ralph's is the retailer that participated and not any of the other major retailers in the greater L.A. area like Vons or..., etc.

D HERMAN : No.

PUBLIC: And number 2 is, did you make any effort at all to give any kind of nutritional information, recipe information, to the recipients? And then the 2nd question would be, has there been any effort to follow-up what the recipients on actual consumption purchases, you know, post-study?

D HERMAN : Those are very nice questions. Let me start, it was Ralph's Food 4 Less, so we used the warehouse version of Ralph's because that was the store. It had to be, for research reasons, within 5 kilometers of the clinic that we were at. So it was at Food 4 Less that we used, because those were the ones that were in those areas.

Let's see, what was the other question?

PUBLIC: It was about the recipes and nutritional information on use of the items.

D HERMAN : Oh, right, I'm sorry. The piece that I left out about WIC is that it has actually 3 parts. One was the package of special foods that they offer, but they also offer referrals as they are an adjunct to health care, and they also have nutrition education classes, so every month participants come back, they have a nutrition

education class. And if you look at what they offer throughout the entire year, they have a very strong emphasis on eating fruits and vegetables, they do a whole thing on consumer education, so what to buy in their supermarket, looking for coupons, you know, just smart shopping. And they also do recipes because they have a number of units on healthy eating related to cancer prevention and diabetes prevention, etc. So within those contexts, these things were offered, but it was not part of our program. They are already offered at the WIC clinic.

PUBLIC: and then any follow-up with the recipients, as far as purchase of fruits and vegetables post-study?

D HERMAN : Right. Well, as I said, we offered the intervention for 6 months, and then we had 6 months where there was nothing. And all that time we were tracking purchase and intake. So for the length of the study, yes. After that, no. The WIC population being low-income is an incredibly mobile population. Also for just human subject's reasons, you have to get consent from everyone. After the period of study, you are not really able to contact subjects again. So theoretically, it would have been impossible; also we didn't have any more money *[laughs]*, so you might imagine, following people up after we had completed the study. So, no.

PUBLIC (Jane LAND from the U.K.): Thank you for your very interesting presentation. It's a related question, really. In your research, were you able to see whether the people using the vouchers were topping them up? Were they making cash purchases for fruits and vegetables that they might not otherwise have done?

D HERMAN : We didn't track purchase, whether cash or credit card. So you are talking about additional purchases to what we had, to what they showed through our program?

PUBLIC: Yes, yes.

D HERMAN : They definitely purchased more because - I am not sure how - but they redeemed these vouchers early in the month. We gave them \$10 per week, but the \$40 for the month was gone very early on. They came back to us usually a month later, we asked the question, did you use all your vouchers, and if you didn't, why? And they had all used them, it was kind of in a 2-week period they were gone. So they definitely did additional purchases because we tracked everything they ate through the 24-hour quantitative dietary recall. So looking at that, they definitely purchased additional fruits and vegetables. However, as I mentioned, the WIC food package is worth \$60 dollars. So they had some incremental money available to them through the Program. But they definitely purchased more.

PUBLIC (Emily GOODWIN, U.S.): Could you please tell us the location of the study

in the State of New York?

D HERMAN : It was the entire State. Statewide.

PUBLIC (Emily GOODWIN): I see, thank you.

PUBLIC (Kristina POLAN from Australia): How long do women usually stay in the voucher system for when they get the vouchers? Because if I were a policymaker, I'd be looking at, you know, if you can increase consumption and then when you stop, you don't have to worry about it anymore.

D HERMAN : Well, actually women stay in for quite some time. You know, they come in at child-bearing age so between 24-45 years and they have a child and often have more children, so if they have 3 children, on average, we've done a dose of WIC computation, and on average it's 8-10 years.

PUBLIC: And the other thing was, does it encourage them to continue breast-feeding? That looked like that might have been one of the outcomes, which sounds great.

D HERMAN : Yeah. Well, that does, but there is also a very large push within WIC to breast-feed. It's one of the other big nutritional kinds of campaigns that go on within WIC. So I think the fruit and vegetables certainly encourage it, and they were actually used as an incentive to breast-feed, because people who breast-feed actually get some additional items, including fresh carrots, even now, before the new packages have been implemented. I should mention that this Program is being implemented now, as of December 2007 it was approved. New York will be the first state, most likely, to carry it out, and there will be a roll out all across the United States, with California implementing in October 2009.

...this type of work is often not reported in a research environment. And so we missed the opportunity to learn from that. But I would be very much in favor of trying to support better evaluation and research of those often very local, but community-driven, initiatives.

S HERCBERG : Merci beaucoup Dena pour cette présentation et cette discussion. Nous allons passer la parole au dernier intervenant, Madame le docteur Hélène Bihan. Elle est médecin endocrinologue à l'hôpital Avicenne en Seine Saint-Denis, qui est un département proche de Paris, particulièrement confronté aux problèmes des populations défavorisées ; elle est également Chercheur au Centre de Recherches en Nutrition Humaine et elle va présenter les tous premiers résultats d'un travail expérimental fait dans le département de Seine-Saint-Denis sur l'efficacité d'un coupon en fruits et légumes à la fois sur la consommation des fruits et légumes et le statut nutritionnel des populations défavorisées.

Providing an economic supplement for fresh F&V purchase

Hélène BIHAN

UREN, U557 Inserm, SMBH-Université de Paris 13, Bobigny, France

Je remercie tout d'abord les organisateurs de m'avoir également invité et je vais vous présenter ici les premiers résultats de l'étude que nous menons en France sur le même intitulé: l'évaluation de l'effet de supplémentation économique pour augmenter la consommation de fruits et légumes chez des sujets précaires.

Les données françaises sont peut-être moins importantes que les données que l'on a vues précédemment, notamment au cours de cette matinée et donc, je vous présente uniquement deux cohortes françaises pour vous montrer un peu la difficulté de la consommation des fruits et légumes chez les populations défavorisées.

On a tout d'abord la cohorte ENNS, ENNS est une enquête de population générale, qui montre que 22% des sujets consomment entre 3,5 et 5 portions de fruits et légumes par jour et 42,8% consomment plus de 5 fruits et légumes par jour. Si maintenant on regarde les données d'une population très précaire, puisqu'il s'agit de la cohorte ABENA, la cohorte ABENA est une cohorte d'environ 1000 sujets qui ont été interviewés, ce sont des sujets qui se nourrissaient essentiellement grâce à des aides alimentaires, donc, pour la plupart, ils étaient sans travail, mais pas sans domicile. Donc, dans cette cohorte, c'est une étude de 2004-2005, on voit que 4% des sujets mangent entre 3,5 et 5 fruits et légumes par jour et que 1,2% des sujets simplement mangent les recommandations de plus de 5 fruits et légumes par jour.

En France, le « programme PNNS », Programme National de Nutrition Santé, c'est un programme qui a débuté en 2001 dont l'un des principaux objectifs est l'augmentation de la consommation des fruits et légumes avec l'objectif sur le plan épidémiologique français de réduire de 25% la fréquence des petits consommateurs sachant qu'elle est actuellement d'environ 50% et c'est dans la population générale.

Là, nous allons nous intéresser à une population de personnes précaires. Dans les objectifs du PNNS, il y a des campagnes de publicité, de communication à la fois par

Objectives of the PNNS

- Everyone should eat at least 5 servings of F&V daily (ie ≥ 400 g/day).
- In France, F&V are concerned with one of the nine priority goals (PNNS 2001-2010).
- The objective is to reduce by 25% the frequency of low consumers (< 3.5 servings per day).
- It leads to formations, communication, mediatic campaign and proposition for national intervention targeting the most deprived population.

www.mangerbouger.fr/pnns/index.php

voie télévisuelle, par presse écrite et donc, une intervention qui va cibler des populations précaires.

L'objectif de notre étude est vraiment celui-là, c'est évaluer l'effet d'un supplément économique pour l'achat de fruits et légumes sur la consommation de fruits et légumes en tant que portion de fruits et légumes dans une population précaire avec les deux principaux objectifs intermédiaires qui sont de tester la faisabilité, on a déjà eu des questions qui vous intéressaient sur la communication précédente et puis les questions également d'acceptabilité à la fois des sujets inclus dans cette étude et des magasins qui allaient distribuer les aliments et recevoir les chèques.

Le protocole de l'étude est le suivant : l'équipe était installée quotidiennement au centre d'examen de santé ; le recrutement se faisait au centre d'examen de santé, qui est situé à Bobigny en Seine-Saint-Denis. Le centre d'examen de santé est un organisme qui dépend de la Caisse Primaire d'Assurance Maladie et qui propose à des personnes tout venant un bilan de santé gratuit de dépistage des pathologies. Au niveau de ce centre d'examen de santé, nous avons proposé à des personnes précaires d'être incluses dans l'étude. Je vais vous préciser ce qu'est le « score Epices », c'est un score de précarité typiquement français et donc, nous avons organisé l'étude afin d'inclure 300 sujets pour pouvoir essayer de montrer une différence de 30% de la consommation des fruits et légumes à la fin de l'étude, entre les deux groupes. Une fois que les sujets étaient inclus dans l'étude, ils bénéficiaient en plus du bilan standard fait par le centre d'examen de santé, d'un bilan nutritionnel pour évaluer les apports nutritionnels, le statut nutritionnel, notamment en vitamines - je vais vous le détailler également - et puis, nous faisions au niveau du centre d'examen de santé une randomisation, un tirage au sort entre un groupe de 150 personnes qui allait recevoir uniquement des conseils diététiques ; alors l'entretien diététique durait à peu près une trentaine de minutes et le deuxième groupe de personnes recevait toujours les mêmes conseils diététiques par les mêmes diététiciennes qui à ce moment-là de l'étude n'étaient pas au courant du groupe dans lequel allait se situer le sujet et à la fin de la randomisation, le sujet pouvait recevoir, donc pour la moitié des sujets, un groupe recevait les chèques fruits et légumes, je vais vous en parler également. Le tirage au sort était appareillé sur des facteurs tels que âge, sexes, et la composition des foyers ; le design de l'étude prévoit donc une réévaluation du statut nutritionnel du bilan clinique avec trois mois de l'étude et peut-être une prolongation, on en discutera.

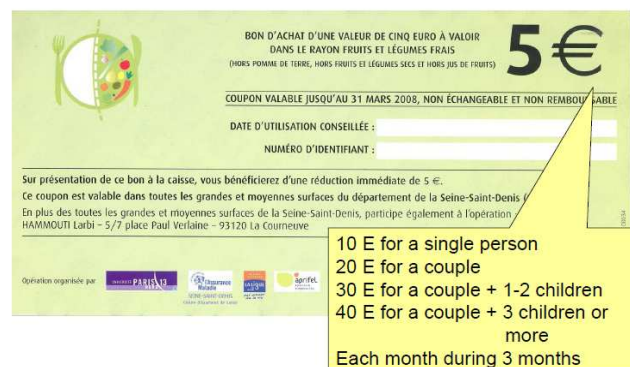
Qu'est-ce que le score de précarité, qu'est-ce que le « score Epices ? » Le terme Epices signifie : « Evaluation de la précarité et des inégalités de santé dans les centres d'examen de santé ». C'est un score qui a été créé en France, c'est vrai qu'à ma connaissance, il n'existe pas de score précis pour évaluer le niveau socio-économique dans les études internationales, on voit souvent les niveaux de revenus mensuels ou le niveau d'éducation ; en France a été créé ce score à partir de 42 questions

interrogeant les personnes sur le niveau socio-économique, les analyses statistiques ont permis de retenir 11 questions qui permettent donc d'évaluer la précarité avec un chiffre au total qui varie entre 0 personne non précaire et 100 personnes étant dans une situation de très grande précarité et ce score a été validé en 2002 sur 200 000 sujets qui consultaient les centres d'examens de santé français.

Voici très brièvement les 11 questions de ce score et vous allez pouvoir voir par exemple dans la question (4) : « est-ce que vous êtes propriétaire de votre logement ou le serez-vous dans le futur ? » - qui peut donc être une des questions permettant de situer un petit peu la personne ; d'autres questions comme par exemple la question (10) : « si vous avez des difficultés financières ou de santé, est-ce que quelqu'un va vous aider ? » C'est donc à partir de ce score, à partir de ce questionnaire de 11 questions qui sont assez simples qu'on définissait un niveau de précarité et nous proposons aux personnes ayant un score supérieur à 38,5 jugées précaires par la création du score de participer à cette étude.

Les données qui sont collectées dans l'étude comprennent à la fois un examen clinique réalisé au centre d'examen de santé pour avoir des mesures anthropométriques : le poids, la taille, le tour de taille, le tour de hanches et la pression artérielle, un bilan biologique pour les marqueurs nutritionnels classiques, bilan créatine anémique, bilan glycémique, bilan lipidique, la feritinnémie, et également un dosage des vitamines A et C corrélé à la consommation de fruits et légumes et autres vitamines qui peuvent définir des carences, vitamines B9, B12 et l'homocystéine.

Le volet « enquête diététique » comprenait deux parties : à la fois un questionnaire que le sujet remplissait seul comportant des questions sur son âge, son niveau d'éducation, son travail, des caractéristiques individuelles de perception de l'alimentation et puis les lieux habituels où le sujet peut faire ses courses et la deuxième partie de l'enquête était donc un rappel des 24 [...] réalisés par la diététicienne avant la délivrance des conseils diététiques, donc, ces données sont collectées initialement lors de l'inclusion et à trois mois lorsque le sujet est re-convoqué au centre d'examen de santé. Ceci est le chèque ou le coupon fruits et légumes français, vous pouvez voir son montant de 5€, je vais vous expliquer également pourquoi et il s'agit d'un coupon qui est échangeable uniquement contre des fruits et légumes frais, donc au rayon frais, mais utilisable dans de nombreux magasins – pour rappel, vous voyez sur le coupon le logo de l'APRIFEL qui est le promoteur de



l'étude et que je remercie au passage – et le code barre qui permet l'utilisation du coupon dans tous les magasins qui disposent d'appareils permettant l'utilisation des codes barres.

Donc, nous avons choisi le montant de 5€ pour le montant du chèque avec une date d'utilisation qui serait ciblée à deux semaines afin justement de pouvoir favoriser l'utilisation des chèques tout au long du mois en mettant des périodes de deux semaines d'utilisation chèque, alors le montant qui était délivré aux personnes dépendait de la composition du foyer, une personne seule allait recevoir 10€ par mois, une personne en couple, 20€ par mois, un couple avec un ou deux enfants reçoit 30€ par mois et un couple avec plus de trois enfants reçoit 40€. Ces chèques étaient donnés initialement par les diététiciennes, puis remis ensuite par voie postale tous les mois pendant 3 mois.

Je vais vous présenter maintenant les premiers résultats qui sont des résultats encore très initiaux, l'étude est encore en cours, l'étude a débuté en décembre 2007, nous avons fini les inclusions fin avril et donc, nous avons pu inclure 302 sujets, et vous pouvez bien comprendre que tous n'ont pas pu être vus à trois mois. Dans les 302 sujets inclus, nous avons 135 hommes et 167 femmes dont l'âge moyen est de 45,5 ans, et le score Epice moyen, ce score de précarité est de 60,8 sachant que pour avoir une idée dans l'ordre dans la population générale consultant en France les centres d'exams de santé, le score moyen est de 25. Donc, je vous présente les résultats de ces 302 sujets quelque soit le groupe dans lequel ils ont été ensuite randomisés. Je vais vous montrer la répartition des sujets selon le travail, le niveau d'éducation puis le statut familial.

En ce qui concerne le travail, vous voyez que 33% des sujets travaillent à plein temps, mais que nous avons au total 40% des sujets, c'est-à-dire 20% des sujets qui étaient en recherche d'emploi, donc au chômage et 20% des sujets qui étaient bénéficiaires des minima sociaux, dont le RMI – cela pour les français.

En ce qui concerne le niveau d'éducation, il s'agit d'une population qui est globalement peu éduquée, donc 67% avait moins de 12 années d'études, donc toujours pour les français, cela correspond à un niveau collège, donc en tout cas pas de niveau baccalauréat, on peut noter sur cette diapositive que 12% ont un niveau d'étude de stade universitaire, notre analyse était probablement, ce sont des personnes qui sont pour une grande part originaire de l'étranger et donc avaient un diplôme étranger qu'elles ne peuvent peut-être pas utiliser en France.

Le statut familial : 54% des personnes sont en couple, et nous voyons aussi que le pourcentage d'enfants dans les familles est de 63% des foyers qui comportent des enfants avec un nombre moyen de personnes de 3,5 par foyer.

Voici les résultats globaux de ces 302 sujets, sujets en situation de précarité, mais insérés quand même parfois par leur travail. Au niveau de la répartition des fruits et légumes : on voit d'emblée en prenant le nombre de portions de fruits et légumes entre 0 et 2 portions de fruits et légumes par jour, nous avons 68% de la population, donc 68% de très petits consommateurs et seulement 8,4% de cette population consomment plus de 5 fruits et légumes par jour – je vous rappelle les données françaises équivalentes de l'enquête nationale de nutrition santé qui rapportait 42% de consommateurs de plus de 5 portions de fruits et légumes par jour. Cela montre bien le niveau de précarité de ces populations et leurs difficultés de consommer les fruits et légumes. En, ce qui concerne la différenciation entre les fruits et légumes, on a l'impression que la consommation de fruits est un peu meilleure puisque donc 15% environ consomment plus de 3 fruits par jour, alors que la consommation de légumes est vraiment très faible, 51% consomment moins d'une fois par jour des légumes.

Quelques données au niveau de la situation socio-économique et donc la perception des sujets, de leur situation sociale et économique ; dans les questionnaires initiaux, 52% des personnes déclaraient avoir des problèmes financiers très importants et donc 40% estimaient ne pas avoir assez d'argent pour acheter quotidiennement des fruits et légumes. 16% déclaraient également avoir parfois manqué ou souvent manqué d'alimentation et seulement 28% n'avaient jamais été anxieux à l'idée de pouvoir manquer un jour d'aliments. A noter également que c'est une population dans laquelle l'accessibilité à la voiture est très faible, à la fois en tant que voiture personnelle et même voiture à disposition par des amis, donc 62% n'ont pas du tout d'accès à un véhicule.

Nous avons aussi un peu regardé les caractéristiques de leur ressenti par rapport à l'offre en fruits et légumes de la région dans laquelle ils se situent et contrairement à ce que l'on peut voir dans la littérature notamment américaine, ici, on a plutôt

Participant characteristics related to food shopping		
Propositions	strongly/moderately disagree	strongly/moderately agree
Choice of supermarkets	6.9 %	78.5 %
Access	4.6 %	88.4 %
Choice in fresh F	2.3 %	86.1 %
fresh V	2.3 %	86.8 %
freezed V	5.3 %	81.1 %
canned V	5.0 %	81.5 %
canned F	5.6 %	77.1 %

In conclusion, food access does not appear to be a barrier to F&V intake in this population.

l'impression que les personnes sont contentes de l'offre de fruits et légumes qu'elles ont à disposition ; donc quand on regarde la proposition de choix des supermarchés proches de leur domicile, 78% nous disent qu'elles sont d'accord ou tout à fait d'accord à la question : « est-ce que vous trouvez qu'il y a suffisamment de magasin à côté de chez vous pour faire vos courses ? » De même, au niveau de l'accessibilité de ces

magasins, 88% sont plutôt d'accord avec la notion d'accessibilité même s'ils n'utilisent pas la voiture, le réseau urbain de transports locaux leur permet de faire

leurs courses comme ils le souhaitent et en ce qui concerne maintenant le choix de fruits et de légumes au sein de ces magasins, ils estiment également qu'à la fois pour les fruits frais et les légumes frais, les légumes congelés ou les produits en conserve, il y a suffisamment de choix pour faire leurs achats. En conclusion de cette diapositive, il ne semble pas que l'accessibilité aux fruits et légumes soit une réelle barrière dans cette population.

En ce qui concerne les facteurs plus individuels, perception de la consommation des fruits et légumes : « j'aime manger des fruits et légumes : est-ce que vous êtes d'accord avec cette réponse ? » 91% des sujets nous disent que : oui, ils aiment manger des fruits et légumes. Maintenant, qu'est-ce qu'il en est dans la réalité et que font-ils ? « Je mange sainement » : seulement 47% des sujets évaluent que leur consommation globale, leur alimentation globale est bonne pour leur santé et « je mange suffisamment de fruits et légumes » : 37%. C'est un peu les mêmes données que nous a présentées le Docteur Herman. « Je pense que les fruits et légumes sont d'un coût abordable » : 34% des sujets ont cette sensation et donc 70% trouvent que les fruits et légumes sont d'un coût trop élevé et le même pourcentage trouve qu'ils ne pourraient pas acheter plus de fruits et légumes.

En ce qui concerne les analyses préliminaires statistiques, on n'a pas remis en évidence de relations entre le niveau d'éducation, ni le travail et la consommation des fruits et légumes ; par contre , on met en évidence au sein de cette population une relation entre la consommation de fruits et légumes et la perception du coût des aliments, également avec la perception d'une alimentation saine, donc les personnes qui mangent le plus sainement sont aussi celles qui nous déclarent manger le plus de fruits et légumes et de même avec les critères motivation à manger des fruits et légumes et le plaisir de manger des fruits et légumes.

Les données cliniques et biologiques dont nous disposons actuellement sont beaucoup plus restreintes : 200 sujets, tout simplement parce que nous dépendons du centre d'examen de santé pour récupérer certaines des données. J'insisterais juste sur cette diapositive sur la différence de répartition entre des index de masse corporelle au niveau des hommes et des femmes, on peut voir pour les femmes dans la dernière colonne que 28% des femmes de cette population sont obèses, 45% sont en surpoids excluant l'obésité ; en ce qui concerne les hommes, 16% des hommes sont obèses et 39% en surpoids excluant l'obésité. Les données biologiques ont été mesurées initialement, mais je n'ai pas pour le moment les données de suivi, donc je passerais. Egalement pour une partie des données qui concernent le statut vitaminique qui sont pour le moment les données qui ne correspondent pas vraiment aux vitamines les plus corrélées avec l'apport en fruits et légumes, mais il est vrai que le dosage de vitamines A et C est une de nos questions qui sera évaluée, donc la modification éventuelle du statut vitaminique A et C par rapport à la consommation des fruits et légumes à trois mois.

A trois mois, pour le moment, nous avons pu réévaluer seulement 50 sujets compte-tenu des obligations de recrutement ; 75% des sujets qui avaient été vus en tout début d'étude sont revenus pour faire le bilan à 3 mois ; 67% pour le moment des sujets du deuxième mois sachant que ce ne sont que des résultats préliminaires. On peut noter que quelques personnes n'ont pas de numéro de téléphone et c'est vrai, comme le disait les oratrices précédentes, c'est parfois une population qui est difficile à reconvoquer.

Voici la diapositive que vous attendez le plus et qui est la seule diapositive qui donne un petit peu une évolution : il s'agit des 50 premiers sujets et pour le moment, volontairement, nous n'avons pas fait de séparation des sujets entre les groupes recevant des chèques et les groupes ne recevant pas de chèques puisque les résultats sont encore trop préliminaires.

Outcome of F&V intake at 3 months

N= 50	Serving	0-1	2-3	> 3	Test t student for delta P = 0.0079
	F&V baseline	40.8 %	36.7 %	22.4 %	
	F&V 3 months	20.4 %	46.9 %	32.7 %	

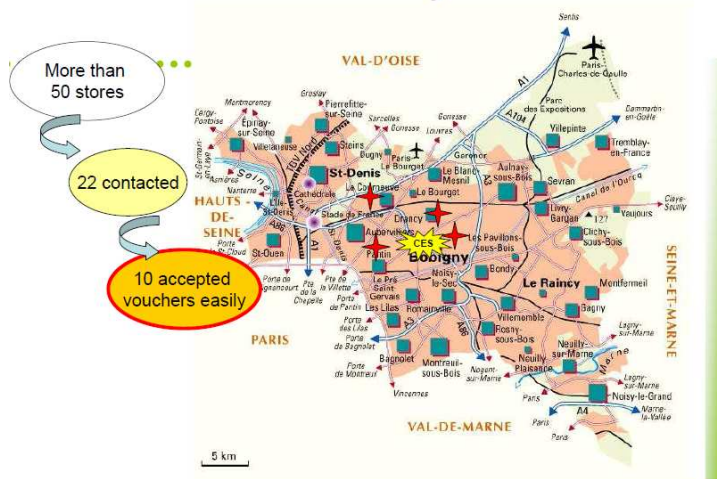
Serving	<2	≥2	Serving	<3	≥3
Fruits (baseline)	61.2 %	38.8 %	Vegetables (Baseline)	100 %	0 %
Fruits (3 months)	46.9 %	53.1 %	Vegetables (3 months)	95.8 %	4.2 %

P = 0,0488 for delta P = 0,0041 for delta

Là, ce que vous voyez, c'est l'évolution chez ces 50 sujets de la consommation en fruits et légumes initialement et à trois mois, quand on regarde la variable globale, 40% des sujets mangeait entre 0 et 1 portion par jour au départ de l'étude, ces 50 mêmes sujets ne sont plus que 20% à être des tout petits consommateurs à la fin de l'étude et l'on voit dans case supérieure à 3 portions par jour, on a une augmentation de la consommation des fruits et légumes chez ces 50 sujets avec une différence qui dès trois mois et pour un tout petit nombre de personnes est significative ; ceci se retrouve surtout au niveau des légumes puisque initialement tous les sujets consommaient moins de 3 portions de légumes par jour alors qu'à trois mois, ses 50 personnes, certaines, 4% mangent plus de 3 portions par jour et c'est une donnée significative. Pour les fruits, on a à peu près le même résultat, moins significatif, mais aussi une augmentation de la consommation des fruits. Je vous rappelle que

l'intervention dans les deux groupes contenait des conseils diététiques et c'est vrai que les diététiciennes étaient extrêmement motivées pour cette étude et investissaient leur rôle de diététiciennes comme un rôle très précieux et avaient vraiment, quelque soit le groupe puisqu'elles ne savaient pas initialement dans quel groupe allait se situer la personne, elles donnaient à toutes les mêmes conseils en leur délivrant les deux guides de recommandations alimentaires, le guide français du Programme National de Nutrition Français et un guide créé par l'APRIFEL qui permet de donner des conseils sur l'alimentation chez des personnes qui ont des petits revenus notamment en insistant sur la possibilité d'acheter des fruits et des légumes en conserve.

Une des questions qui est posée par cette étude, c'est la question de la faisabilité, c'est une question qui nous a été demandée dans l'organisation de l'étude avant de pouvoir envisager une extrapolation de l'étude ou de proposer des mesures nationales parce qu'il est vrai qu'en France, pour le moment, on n'a pas de programme national comme la WIC aux Etats-Unis et les programmes anglais, donc la question était la question de la faisabilité. L'acceptabilité à la fois au niveau des personnes : est-ce que les personnes recevant les chèques fruits et légumes allaient vouloir les utiliser ? Pour le moment, on n'a que de bons retours, tous les sujets sont très enthousiastes à l'idée de recevoir des chèques et nous ont vraiment fait un accueil enthousiaste lorsqu'on leur proposait de participer à l'étude ; les sujets qui ne recevaient pas de chèque, mais uniquement des conseils sont également enthousiastes ; pour le moment, dans les 50 sujets qui sont revenus, on a 25 sujets du groupe recevant des chèques, mais également 25 sujets qui appartenaient au groupe ayant reçu uniquement des conseils diététiques. L'utilisation des chèques par les personnes, c'est une des questions que nous nous posons également, à la fois, quels vont être les produits choisis ? Est-ce que l'on pourra évaluer avec l'analyse des tickets de caisse ? Les difficultés éventuelles rencontrées pour l'utilisation des chèques : est-ce qu'elles ont eu des barrières lors de leur utilisation, mais aussi quelles ont été les personnes du foyer bénéficiaires des chèques ?



Un mot de la faisabilité au niveau de l'organisation pratique sur le terrain : je vous montre ici une carte du département de la Seine-Saint-Denis situé au Nord-Est de Paris. En jaune, au centre, vous voyez le CES, le Centre d'Examen de Santé qui était l'endroit où nous recrutons les personnes et où avait lieu le bilan de santé. Initialement, plus de 50

magasins avaient été contactés plus ou moins directement pour participer à cette

opération, mais avec une campagne de publicité qui n'était pas très importante, ce qui peut expliquer parfois certaines barrières dont je pourrais reparler, mais au final, nous avons une dizaine de magasins qui acceptent extrêmement facilement les chèques pour lesquels maintenant les personnes sont bien orientées et n'ont plus de problème pour leur utilisation, donc toutes les personnes à qui on a délivré des chèques et qui sont revenues nous ont bien rapporté l'utilisation facile lors d'un passage en caisse sans aucun problème.

En conclusion de cette étude, cette population précaire de Seine-Saint-Denis, on voit que la consommation quotidienne de fruits et légumes est extrêmement basse puisque plus d'un tiers des sujets consomment moins d'une fois par jour des fruits et légumes, que ces sujets rapportent comme première barrière pas tellement des problèmes d'accessibilité ou de disponibilité des fruits et légumes dans les magasins environnants, mais plutôt une barrière économique pour les premières analyses et qu'il s'agit d'une des premières études françaises dans ce domaine qui avant de proposer des mesures plus larges sur le plan national va pouvoir évaluer l'efficacité de chaque fruits et légumes pour augmenter la consommation de fruits et légumes avec deux aspects intéressants, à la fois la consommation en tant que portion évaluée par les diététiciennes, mais également on espère peut-être voir un impact au niveau du statut vitaminique, notamment en vitamine A et C, à la fin des trois mois et l'on espère également grâce à la poursuite des soutiens pouvoir poursuivre cette étude : les premiers sujets qui sont revenus à trois mois étaient très volontaires pour revenir se faire évaluer à six mois sachant que ces sujets revus à trois mois ont bénéficié de nouveaux chèques à la fois en tant que remerciements de chèques fruits et légumes et que l'on attend un petit peu l'écho de cette étude pour savoir jusqu'à quand on va pouvoir la poursuivre. Je vous remercie.

Q&A

S HERCBERG : Merci pour cette présentation d'un travail expérimental qui est en cours et qui fournira sûrement des résultats d'information très passionnant. Nous avons le temps pour un petit nombre de questions rapides.

PUBLIC (Sandra MEYER from the European Association): Thank you very much for the excellent presentation, very interesting. For this study, the decision to exclude processed, frozen vegetable, canned vegetable, etc., was it a conscious decision or was it just a practical decision in term of who do we get on board for the supermarkets because in my local "Carrefour" the fresh green beans, the greatest part comes from Kenya and any frozen green beans you buy are normally frozen within 4 or 5 hours after the harvest and you have excellent nutrition values for example for frozen, but also for can products and you also bring in the cost aspect and before that over and over again today for this advanced layer of society

processed vegetables in particular are frequently at a stable price available all year around at very good prices, so would that also be an idea for the future to include these and to see if this has a different impact ? Thank you very much.

H BIHAN: Pour répondre à cette question, c'était une décision en effet plutôt pratique dans le sens où la mise en place de l'étude et justement l'idée de pouvoir la faire accepter par les magasins environnants nous a fait sélectionner le rayon fruits et légumes afin de faciliter la communication auprès des magasins et de faciliter aussi le discours auprès des personnes, donc, c'était simplement pour le moment des considérations pratiques.

PUBLIC: Je voudrais savoir quand cette étude prendra fin et ce qui était prévu peut-être comme prolongation, ou du moins qu'est-ce que vous espérez après sur le plan national ?

H BIHAN: Pour ce qui est de revoir les sujets à trois mois, on pense probablement avoir pu revoir tous les sujets en septembre, on a fini les inclusions en avril début mai, donc, c'est vrai que ces personnes vont être revues en juillet ou peut-être un petit peu décalé à cause de certaines contingences logistiques, donc à trois mois, pour la rentrée et puis en ce qui concerne la poursuite de l'étude, c'est encore des discussions en cours, les derniers sujets seront revus probablement en septembre et on devrait prendre une décision très prochaine pour savoir si les sujets qui ont été revus à trois mois, on peut continuer à les suivre à 6 mois, ce qui est vraiment notre désir et on attend des réponses.

PUBLIC: Et sur le plan national ?

H BIHAN: Sur le plan national, c'est une mesure qui avait déjà été discutée par le Professeur Hercberg au niveau national il y a quelques années lors de la mise en place du Programme National de Nutrition Santé et - il va répondre après moi - mais on lui avait initialement répondu que avant d'envisager une mesure nationale, il fallait justement prouver la faisabilité de l'étude et son efficacité, donc c'est ce que l'on fait dans cette étude, avec l'espoir de pouvoir le proposer sur le plan national.

La question est de savoir s'il est possible d'extrapoler ce type d'action qui a, bien évidemment un coût, 10€ par mois et par personne multiplié par 5 millions de personnes qui en France ont des revenus considérés comme insuffisants pour pouvoir avoir accès à une alimentation suffisamment riche en fruits et légumes amène à un coût qui est tout à fait considérable, donc c'est une opération pour laquelle sur les bases de travaux scientifiques, il est peut-être possible de convaincre des municipalités, des collectivités locales ou territoriales de s'investir ou des partenaires d'autres natures pour développer des actions ; pour l'instant le Ministère de la Santé et le Comité interministériel qui a décidé des choix d'orientation du deuxième programme national de nutrition santé n'a pas retenu l'idée d'une mesure

générale, mais soutient des initiatives qui pourraient avoir lieu au niveau des collectivités. Et je pense que les éléments d'informations issus de ces travaux, mais également de tout ce qui a été présenté dans d'autres expériences à travers le monde sont des éléments qui aideront à pouvoir dialoguer avec les pouvoirs publics.

PUBLIC (Laurence [...], Fondation Louis Blondel) : C'est une question à Mesdames Anderson et Herman. J'aurais aimé savoir si les associations caritatives qui viennent en aide aux personnes défavorisées notamment sur le plan alimentaire ont été impliquées dans les études que vous avez montrées ou bien si elles ont des initiatives dans le sens de favoriser la consommation de fruits et légumes et quelles seraient ces initiatives éventuellement ?

AS Anderson: In this study I described, no charity organisation have been involved, but charity organisations are involved in many community food initiatives, but in the U.S. for all community-based research, at least relating to some aspects of food security, which often times involves also fruits and vegetables intake. So to some extent, that research is available. There is also many very large organizations like FAC, which is a Food Research and Action Coalition that stay very current with these are more of a policy advocacy organization, as opposed to a welfare organization. But they also tend to gather data from smaller groups who are working in this area, so we have some report of it, more often than less, in local news. But we didn't have any support, financially or otherwise, from welfare organizations.

D HERMAN: Thank you, as well. Most of what Dr. Anderson has said is also true for us. We did not have any welfare type of organizations involved. However, there are a number that are involved. And this type of work is often not reported in a research environment. And so we missed the opportunity to learn from that. But I would be very much in favor of trying to support better evaluation and research of those often very local, but community-driven, initiatives.

S HERCBERG : S'il n'y a pas d'autres questions, je vous propose que l'on clôture la séance et il me reste à remercier les speakers pour leurs excellentes présentations et je tiens à remercier l'audience pour sa participation active aux débats. Merci à tous.

Fruit and Vegetable Summit Proceedings



May 27-30, 2008 - Unesco, Paris

Presented by EGEA – IFAVA
Co-sponsored by the World Health Organization (WHO)
With the participation of the European Commission
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With the technical cooperation of the Food and Agriculture organization of the United Nations (FAO)

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MARKETING SESSIONS

From environmental changes to social marketing and communication: How to change consumer's behaviour?

P

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SESSION 4

EMPOWERING THE LOCAL AND GLOBAL F&V VALUE CHAINS: POLICY AND PRACTICE

Chairs: **L. Dubé** and **R. Lemaire**

- Empowering the F&V industry in the fight against obesity: A Brain-to-Society Systems model. **L. Dubé**
- Challenges faced by the Fruit and Vegetable industry. **R. Lemaire**
- Value-chain perspective. **C. Hawkes**
- Innovation perspective. **R.J. Brummer**
- Social norms and culture perspective. **C. Fishler**

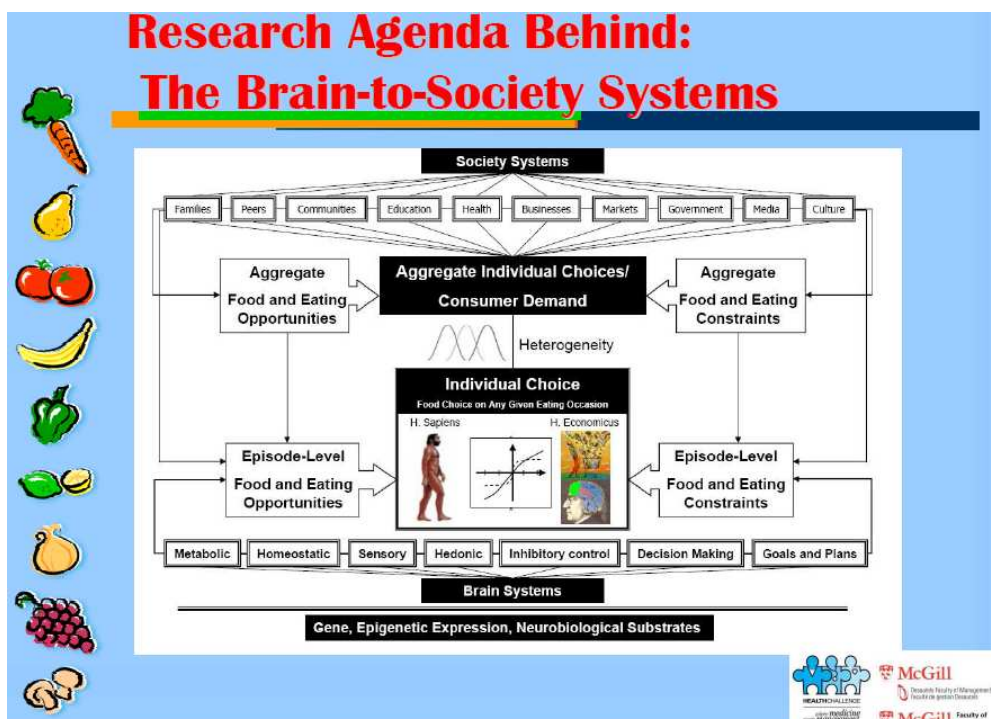
Empowering the fruit and vegetable industry in the fight against obesity: A Brain-to-Society Systems model

L. DUBÉ

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Building upon the Brain-to-Society Systems model and the material which emerged from its knowledge-transfer arm, the McGill Health Challenge Think Tank, the following paper will briefly outline some key issues relating to the fruit and vegetable industry and the potential role it could play in the prevention of obesity. More specifically, it will take a multi-sector, multi-level approach to examine three levels of action where targeted action could empower the fruit and vegetable industry in the fight against obesity: (i) the biology/individual/family level, by highlighting the importance of parental practices in promoting fruit and vegetable consumption among children taking into account their relative biological handicap compared to their sweeter and fatter alternatives; (ii) the community/educational level, by examining novel marketing techniques to promote the consumption of fruits and vegetables; and (iii) the policy level, by discussing how a sophisticated understanding of the relationship between product category pricing structure and consumption price may suggest high return for subsidy support to the fruit and vegetable industry. This paper will conclude with lever points for change that would simultaneously promote fruit and vegetable consumption as well as stimulate the economic performance of the sector.

BACKGROUND: The Brain-to-Society Systems model and its related McGill Health Challenge Think Tank



Whereas health research primarily focuses on a single key element in trying to guide the human machine, the Brain-to-Society model aims at providing a more sophisticated understanding of the indicators of human biology and society systems. Indeed, it recognizes that the examination of the individual and society choices that shape eating and physical activity must address the full range of biological and socio-environmental drivers. This means looking at all levels, from gene, biology and brain to government policy, business practices and social norms. It also means examining the motivations, decision rules, and feedback mechanisms of the actors involved, both within each of the levels and at their interfaces. Together, they form an entire system which shapes individual decision-making as well as the environment in which decision-making occurs.

While public awareness of the obesity pandemic and of its related health, social and economic consequences has slowly arisen around the world, the scale, scope and speed of interventions are clearly insufficient to halt its progression. McGill University, through a unique partnership between its Desautels Faculty of Management and Faculty of Medicine, has launched a novel platform based on the Brain-to-Society Systems model. The McGill Health Challenge Think Tank is anchored in the belief that only by bringing together the best minds and the most powerful organization of health and economics can we develop and implement effective, targeted anti-obesity actions. It is within this context that the 2007 edition of the Think Tank took place, examining the food chains and its potential role in alleviating the obesity crisis.

At the basis of this perspective is the belief that obesity and its related chronic disease are woven into the ways we – as individuals, families and communities – live, consume, invest and take care of our children; the way in which we – as school, health, media and business organizations – produce, promote, trade and provide goods and services to individuals, families and communities; and the way in which we – as institutions on trade, investment markets and governments – shape the arena in which individuals, families, communities and organizations evolve. Society has become maladaptive to human biology and multi-level and multi-sector change must take place across the system in order to re-establish a balance between biology and the social and economic environment in which it lives. The following paragraphs will highlight various levels of action where change may yield significant outcomes in the fight against obesity and in the promotion of healthier lifestyles.

INDIVIDUAL/FAMILY LEVEL: The importance of parental practices in promoting healthy lifestyle habits among children

In the fight against obesity, action is usually targeted at schools and governments. Yet, a key element, often ignored, is the role of parents in the acquisition of lifestyle habits. Taste and preference, it has been found, is shaped early on in life and is

characterized by a biological bias towards high-caloric foods. Yet, the role which a parent plays in a child's early life can have a significant impact on the child's future health and ability to maintain his/her weight. A child's attachment style refers to the degree to which a child feels attached to his parent or caregiver. A child with a secure attachment style will be more willing to explore, try new things, and move into unknown territories. It is important that parents create a reassuring environment in which new tastes and horizons can be explored.

The Brain-to-Society research team conducted a cross-sectional study of 200 parent-child dyad. The children ranged for 8 to 12 years of age. Both the child and the parent reported on their attachment style, the knowledge of fruits and vegetables, and their consumption of both fruits and vegetables and high-caloric foods. Results, after controlling for age and other factors, showed that the more securely attached the child was to his parent/caregiver, the greater the knowledge of different types of fruits and vegetables, the higher the consumption of fruits and vegetables and the lower the consumption of high-caloric food. This relationship was also stronger in boys than in girls.

In the fight against obesity and the development of the fruit and vegetable sector, this could provide an interesting avenue for cross-sector interventions.

COMMUNITY/EDUCATIONAL LEVEL: Novel marketing techniques to promote the consumption of fruits and vegetables

Novel marketing techniques can also be used to promote the consumption of fruits and vegetables. Traditional methods have focused on advertising the health benefits of fruits and vegetables. Yet, the Brain-to-Society team has found evidence that fun, play, and laughter may prove to be a more effective way of communicating the health benefits of fruits and vegetables. Indeed, behaviour is often driven by non-rational and biological components, emotions, etc. This has to be taken into account in marketing.

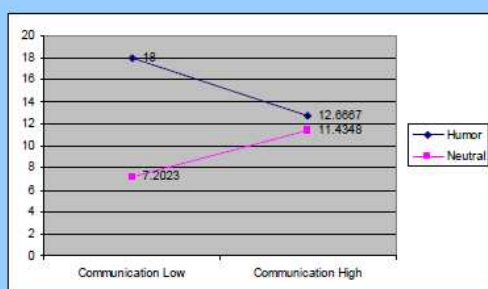
Building upon the 5-a-Day Program, a web intervention was designed, called Marathon-Nutrition. The same information, pertaining to fruits and vegetables, was presented in either a neutral way or a humourous way. The later focused more on increasing knowledge through fun, dynamic and entertaining communication than on healthy behaviours.



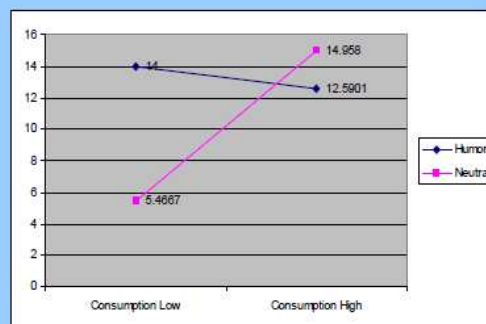
Changes in the consumption of fruits and vegetables were examined. Humour was shown to be a more effective communicator of information than the neutral message. Again, it was more effective with boys than girls. It also had a more significant impact in families where food consumption was little discussed.

Humor was more beneficial for families that don't talk much about food consumption.

Impact on humor on F&V knowledge moderated by communication



Impact on humor on F&V knowledge moderated by consumption



POLICY LEVEL: Changing the way we think of policy in the promotion of fruits and vegetables

Novel, breakthrough policy changes can also have a significant impact on the promotion and consumption of fruits and vegetables. Dr. Josef Schmidhuber, a senior economist with the FAO, looked at the relationship between the Common Agricultural Policy in the European Union and the quality of diets during the 2007 McGill Health Challenge Think Tank. He exposed in a compelling manner the moderating role which price structures and their variations across diverse product categories can play in influencing the health impact of agricultural subsidies. For example, the price of wheat, the primary agricultural product used in the

manufacturing of bread, accounts for only 5% of the final price of bread, the remaining 95% attributed to marketing and other non-agricultural components. This is also the case for many corn-based products. In light of this, Dr. Schmidhuber argues that a reduction in agricultural subsidy would have very little impact on eating habits, since it would be diluted through the various elements of the value chain that separate the farm from the plate. Applying this concept to the fruit and vegetable sector, due to its simpler price structure with a lower number of intermediaries between primary producers and consumers, public investment to support the production and promotion of fruits and vegetables, whether in the form of subsidies or other means, could potentially translate into an increased consumption. Changing the way we think in regards to policy-making and targeting small, but effective actions to specific issues can yield a significant transformation of the fruit and vegetable sector as well as of individual lifestyle habits.

CONCLUSION: Lever points for change

In conclusion, the Brain-to-Society Systems model offers some interesting, multi-level, multi-sector lever points for change that could be used effectively to promote healthier lifestyle habits among individuals while improving its economic performance. A main point highlighted above relates to importance of emotional reinforcements in driving individual choice. Indeed, choice on any given occasion reflects a delicate balance between wired-in and/or over-learned habits, and more flexible and controlled - yet effortful - cognitive processes. As such, interventions need to appeal to both the rational and the underlying unconscious. A second lesson offered by the Brain-to-Society Systems model is that targeted, multi-segmented approaches to obesity prevention and the promotion of fruits and vegetables can yield more tangible results than its single-focused counterpart. Finally, policy change and public investment must support these interventions if they are to reach the scale, scope and speed needed to halt the progression of the obesity pandemic.

Challenges faced by the Fruit and Vegetable industry

Ron LEMAIRE

Canadian Produce Marketing Association, Ottawa, Canada

I will begin and touch on the challenges faced by the fruit and vegetables industry. I had a laugh when I was chatting about what we needed to touch on. I figured that I'd take the easy subject, challenges around fruit and vegetable industry. The fruit and vegetable industry, and I mentioned it at Montreal, is that we as an industry are on the side of angels: we grow food that is good for you. How simple is that! You should be able to take that food, you should be able to grow it, ship it, sell it and someone should be able to eat it and we should all be better for it.

That sounds very simple but unfortunately the process is not as simple as I make it out to be. We work with a multifaceted and integrated industry that is also fragmented. And that fragmented industry creates many of our challenges that we deal with on moving products to the market place as well as controlling some of the elements you heard this morning when you talked about price, access and availability of various products.

Interestingly, on a global level, we have done quite well as a fruit and vegetable industry and seeing increasing consumption volume in product in the market place. Going back to 2004 we saw quite a dynamic jump in the world economy. Globally we saw increases some amongst the fastest in a few decades around growth moving to \$56 trillion in 2004 for \$7 trillion in 1950, massive jumps on a global scale. When we look at what average income it was during that time as well from the 50's to 2004 again we saw massive jumps, and from a produce industry perspective we also saw growth. Now, not taking into account some of the transitioning that is happening from bio fuel, from agricultural lands to bio fuel, that we have seen within the last decade, looking at more specifically around actual products available to eat and the opportunities that surround that, what is actually driving the produce industry? What are the pieces that make produce key factor in getting into the market? At the end of the day it is still consumer driven; producers will produce products that consumers want to buy and they will adapt maybe not quickly but they will adapt to the process to ensure that they are meeting consumer needs. It is vertically coordinated we talk about the supply chain I mentioned from my organisation we are vertically integrated organisation. Looking at primary producers right through the retail you need that entire supply chain in place to ensure a smooth transition of the product to the consumer. It is technology oriented now more than ever within the produce industry. We are technology driven most specifically because of the need to reduce on our costs, input costs and other areas. The efficiency is to move product through the system at retail to ensure that we have high efficiency at check out to reduce costs to the system are very important to ensure that the consumer at the end of the day has a manageable product that they can purchase within an affordable

level. The one that we love and love to hate in some ways from an industry perspective is the government regulation. Are we over regulated? It depends on who you talk to but in some cases regulation is a positive aspect of how we have to move forward. The goal is are we moving forward within a smart regulatory framework or are we moving forward with integrated /unrequited regarded regulations that do not meet the need of today's market place?

The challenges for fruit and vegetables are enormous and for the time I have I can not go down all of them but briefly breaking down to the five key areas I want to very quickly go through them to touch on what we have to deal with just to get product to the consumer:

- high production costs;
- transportation costs specifically due to 2 core areas: there is nobody to drive the trucks and the cost of fuel is creating an increasing input cost;
- distribution cost, another core area;
- consolidation and the global market place as well as looking at;
- the relative consumer perception around high product costs.

When we look at the 5 key points that we have here as a whole this is augmented and modified even more so by the fragmentation in industry. I like to say that we are doing all of our challenges when we put them on ourselves. In that, when you are walking in a retail store you are walking and you see anywhere between 400 to 600 SKUs that tell you how many different fruit and vegetables you have in one category. Think of milk, if you want to market milk it is a very simple singular commodity focus. If you turn around and start talking about fruit and vegetables in a very broad base you can just say we need to eat more fruit and vegetables but then when you start talking to an apple grower it is very different compared to talking to a broccoli producer or potato producer and so on. On market initiatives the fragmentation in many cases becomes one of our biggest challenges. Even within the apple category, if you take Canada as an example, the number of apple packers and producers we have in Canada that compete against each other to put product in the market place actually creates a negative impact overall for the apple category in putting products priced properly for the producer and also potentially marketed properly relative to the amount of dollars that are available to tell the consumer that apples are a good part of your diet. The fragmentation of those marketing dollars and the fragmentation of the efforts to get the products to the customer create a challenge within the system that is underlying everything that we do amongst moving products to the market place.

Input cost: Relative to the high input costs we are looking at increased costs from everything from seeds. One specific area I want to touch on is food safety. It is a big focus globally right now. Today if I am shipping products inside of Canada I would register and be part of what they call the Canadian Horticultural on Farm Food Safety Program. Many of the retail customers and wholesale customers would require that you participate in this program. However, if I want to ship into the US

immediately I would be required to follow the *UC Davis Protocol* or even EUREPGAP or GLOBALGAP and if I am Mexican I may be on Mexico GAP, Chilean Chile GAP and so on. So, all of these various GAP programs that are in the marketplace, also have associated to them audits that are required. So, one shipper or grower that is shipping into 5 different countries may require 5 different audits augmenting increase in the costs of input on his systems. Just a small example of how the producer globally is being forced into looking at how we can harmonize an approach to accept the multiple various good agricultural practices that are being put forward but understanding that if is perhaps a CFT/CHE on farm food safety program: how much of a variance is that program from the GLOBALGAP program? And can the retail customer accept both and that way only require one audit from the producer and reduce some costs points at that level?

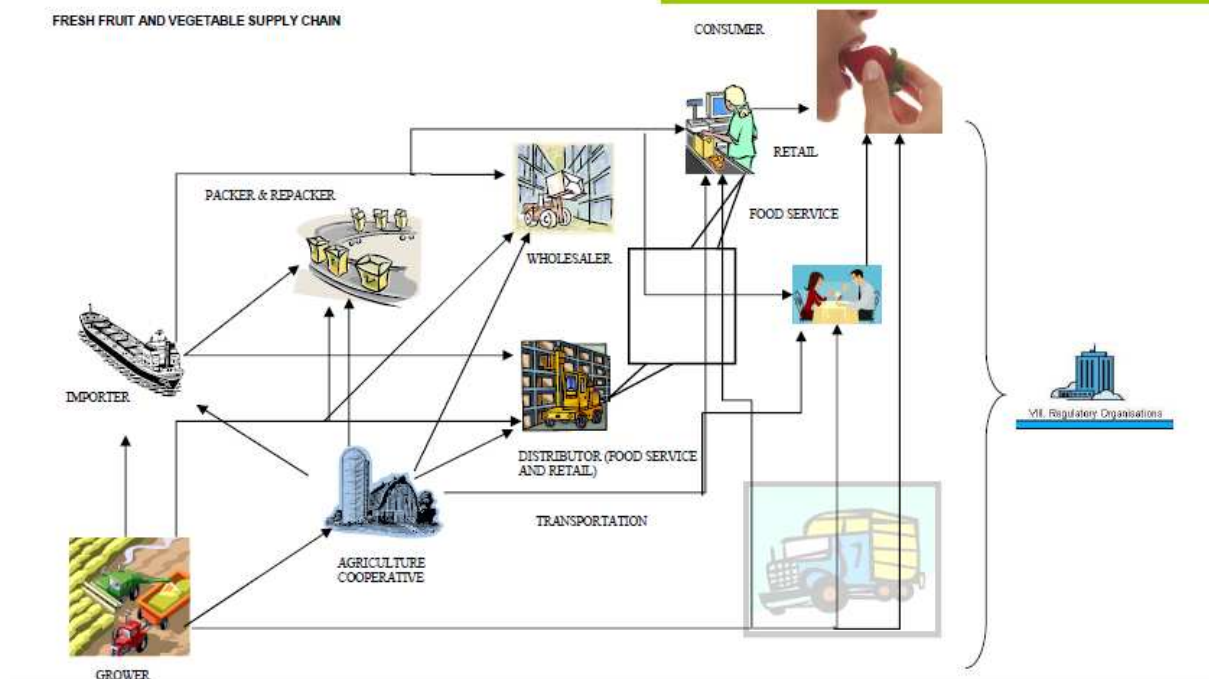
Transportation: Fuel is an issue but let's move it to the side because it is a huge discussion we could get into. Let's talk about human resources. The lack of drivers that are willing to actually drive trucks is a huge issue that we are seeing in North America and that we are seeing in other parts of the world. Just to get the product to the customer and outside of the farm is becoming a massive issue for the industry. The amount that is required to pay and move that product is increasing.

Distribution costs: Again, part of these moves back into the upfront costs of efficiencies. Efficiencies are key to ensure that we reduce the end costs of the product. But there has to be an upfront cost to go into the system and right now the industry is playing catch up to ensure that the technology is in place to the distribution channels to ensure that they are not seeing a high amount of shrink on product as well as an efficient flow of the product through the system.

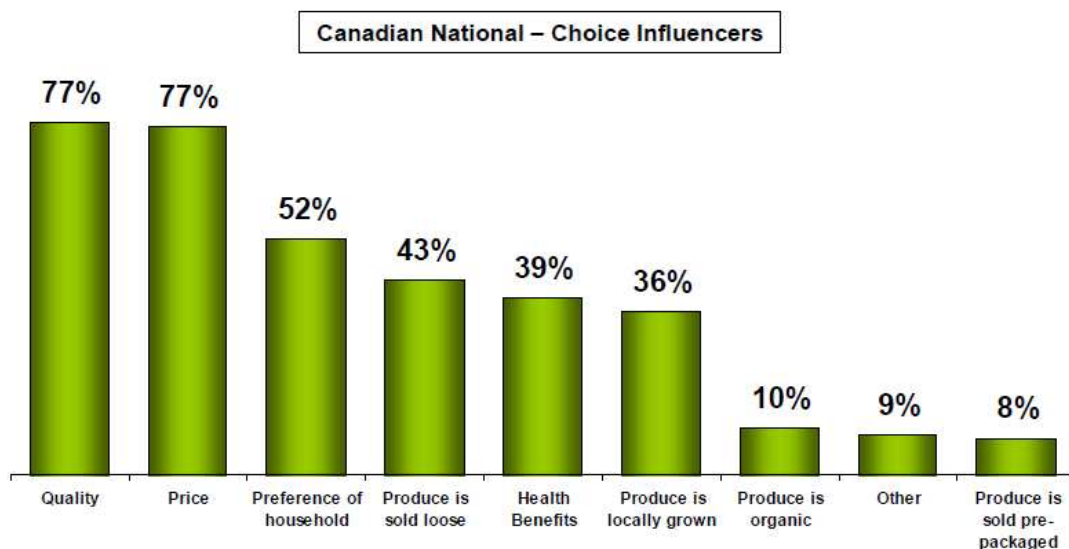
Consolidation and the global market place: Fewer retailer customers out there are buying when we have multiple buyers in the market place creating a more competitive environment for products to be sold; it's creating challenges within the system. It does create an ARPS scenario, a deflationary market for food which is interesting in the Canadian market place compared to the rest of the world but on a global level does create challenges for the primary producer, and requires that the primary producer, if they do want to work within a global market place, has to be more creative on how they model their operations. Not longer can they be a stand alone producer. The models focusing on a more dynamic cooperative approach or strategic partnerships within business so that they can move a higher volume of product that is following the needs of the consumer: right quality, right price and great consistency year round are keys within that model.

High consumer prices: We heard the comment around nutrient value relative to costs. When we start looking at fruit and vegetable cost, there is no doubt that there is a cost for fruit and vegetables. Relative to the full diet and the actual value that the consumer is getting out of eating those fruit and vegetables what is the correlation on the actual costs? And can you fit that fruit and vegetable into their diet? From sources of Canadian data on price points shows consistency of pricing around and value.

The Supply Chain



This is a very simple diagram of what the supply chain looks like, showing how product flow into the system, to give you an idea of where potential input costs can happen along the system to where at the end of the day the consumers are going to pay that end price for their products. At any point of this system you do see an increase in the price paid for that product at retail. When we look at some challenges looking at some of the elements around consumer drive right now on social responsibility, going green, hundred mile diet carbon foot print all of these elements are key focuses for the produce industry and understanding how do we fit within that consumer demand. Our organisation in Canada has recently done a literature review to understand that consumer influence.

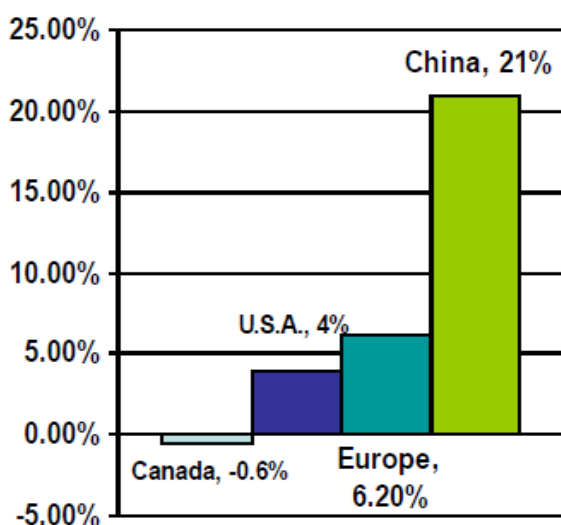


Source: Nielsen "5 to 10 a day for better health" survey results for 2008.

The interesting thing that we found is, when we did the analysis and asked the core questions, that there is not doubt buying local and organic and other core products are very important in the purchase decision but, at the end of the day, quality is number one. If we look at data globally we continually go back to the quality question. Price plays also a key factor and that price will vary also on a global level, it will adjust also on different socioeconomic groups down you may have health benefits moving up slightly but within the top five they move as a group. What we found quite interesting when we talk about some of the challenges for our industry when we look at the quality/price and consistency question it comes back to how are we producing products to meet that consumer need. The consumer is very freakish, if they walk into a store and they do not see the right quality, the right price, and the right consistency year round now they have a very quick adjustment to something else in the store. Many developed countries have such a variable opportunity to choose from in their choice and unfortunately price points items that are whether high in sugar or high in fat that they can move to.

When we look at food inflation for the fruit and vegetables industry this is a huge challenge for us. We heard some discussions this morning and the interesting question is "with bio fuel increasing would we see decrease in price of fruit and vegetables?" That is challenge when that comes with more people creating product from bio fuel we see less area land mass used for fruit and vegetable production which balances that overall cost of availability and so on. But not everywhere in the world is identical as we can see on this figure of food inflation of February 2008 (inflation of fruits: -6.7% and Veggies: -11.6%).

Food Inflation

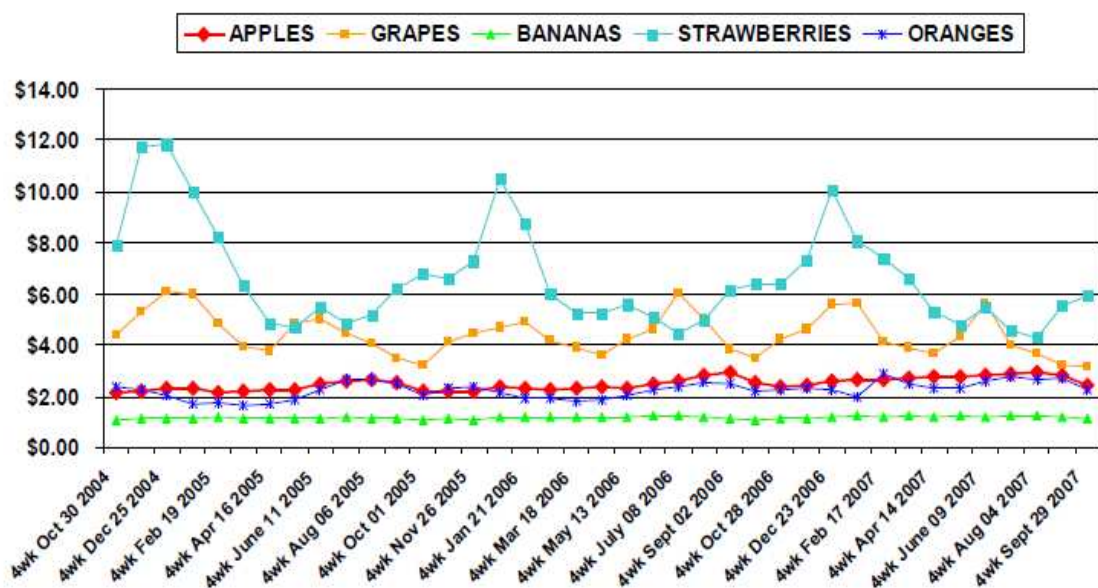


Inflation Feb 2008

- Fruit, -6.7%
- Veggies, -11.6%

In Canada we see a deflationary marker that is now changing and we will see catching up to the rest of the world. A big factor to this, we have a strong Canadian dollar, we are now about the power of the US dollar. We also have a market that only has a very small group of retailers. The consolidation of retail has been very effective in pulling our major retailers into a small group of 3 or 4 major players. They have controlled, because of competition at retail level, price point within the market place and they have worked with their supply partners to ensure that product flowing through comes through with the right quality, price and consistency for that consumer at the end of the day. While it is wonderful for the consumer to see the deflationary prices on their products, it is tremendously challenging for the producer to maintain that so that at long term they are able to be sustainable and viable to move product through the system. We have to find the balance not only on our markets but similarly globally.

I touched on the price point for fruit and vegetables. A good example is the Top 5 Fresh Fruits in Canada.



Source: Nielsen FreshTrack, National Grocery Banner, Top 5 Fresh Fruits, Avg retail selling price / FT equiv KG, 3 year 4 weekly period ending September 29th, 2007.

When we look at the bottom at apples, bananas and oranges we see a very consistent price point across the board. It does not matter what time of the year -for those of you who have been to Canada in middle January you won't see many apples hanging on our trees (...)- because of global market place we benefit from the availability to fresh fruit and vegetables year-round and the availability of a well-priced good quality and consistent product year-round. When we deal with the general public and we talk to them saying buy in season, buy local, that's a key question and message for us, but let's not migrate away from fresh in the off season. Because of the global market we are now seeing a more consistent application of

pricing and granted there are some demographics in the market and socioeconomic groups that should migrate to price points of frozen and canned, fresh is still an option to incorporate in that diet. Looking at vegetables we are in the same boat, the Top 5 Fresh Vegetables being peppers, onions and carrots being the cost affordable options year round moving through that system plus tomatoes and potatoes.

The Barriers: Convenience, access, taste and changing norms relative to what we need to look at in the future are the core barriers that the fruit and vegetables industry have to address. When we deal with our consumers and start identifying to them some of the core areas, looking at convenience/lack of convenience, innovation is key. How do we as industry show new innovative ways to provide convenience to the consumer? Especially within this fast pace, dual income, very complicated lifestyle that many consumers in developed countries are dealing with. What do we need to do to identify and support that?

In terms of storage and transportation, consumption and cooking we heard on Barbara Rolls presentation on including broccoli into pasta sauce. Do consumers have enough cooking skills to actually do so? Surprisingly enough, we are seeing a demographic between 18 and 25 that are going back to cooking. They are moving to a lifestyle where they do not want to live the 45 to 60 hours a week work lifestyle, they want to be more out-door oriented, they want to enjoy food, and they want to enjoy cooking. They are going to be the change group that we will see in the future push that whole envelope around what do I do with my food now? I did not necessarily get the background information from my parents now I need to go the market to find out what I need to do to cook.

On storage, key back to cost, the more and more I hear from the fresh industry and from the consumer around: "I bring my tomatoes home I put them in the fridge and next thing I know is that they are terrible tomatoes." For God's sake, don't put your tomatoes in the fridge! Don't put them next to your bananas; don't put your apples next to your bananas! There are simple storage pieces that can prolong the shelf life of product that the consumer just doesn't know.

Looking at access, this is one of our key issues. We are growing and seeing better access in developed countries, looking at convenience stores, having products flow through convenience stores, at least the core staples. But it's a bigger discussion and one that we need to engage our public partners to get more involved in. How do we look at our built environment and how do we actually build and expand our built environment so that access is a key component and fruit and vegetables are incorporated into that access element? So developing our public/private partnership to move forward to ensure that if I am an inner city resident that I can guarantee walking to my local core store where I am going to buy the potato chips and other elements that are part of my diet that I have an option of that fruit and vegetable. And then one step further than that, there is an education component: educate to why is that foreign apple in my store, what does it mean? Should I buy it? But I have never seen this apple before. We can not have one without the other.

The next step is taste. All of this is for not if we do not focus back on taste. We keep forgetting about that core element of taste within everything that we do. When we talk around eating fruit that is simple with the sugar content and the dynamic nature of many fruits, it is simple to get children for example engaged in fruits. On the vegetable side, it is a bit more complicated based on taste. However, it is possible and starting from a young age we have to be more focused on engaging children. An example is the Irish Program Fruit/Food Dudes: giving a taste profile and having children exposed to that 70 week period of vegetable and fruit is key for the long term development of lifestyle habits around eating vegetables and fruits.

Looking at that next step from taste to changing norms, the two come together. We need to look at most definitely the challenge around number of consumption occasions. This also links back into shopping habits. What is the frequency of shopping? Right now we are seeing shopping habits in Canada reduced down to 1 to 2 times a month as opposed to what it used to be where you'd have weekly shopping excursions. Parts of that also comes back around our built environment where once I'm in my suburban area I am not going to take the effort to drive my car to go get my products, I am going to make one shopping effort, I am going to buy everything I need and leave it at that. So, how do we address that as supply chain and work towards increased access and increased occasions for shopping, purchase and consumption? And the biggest piece of all around changing norms is advertising. (...) What can you do with 400 thousand dollars? Amazingly enough, I know in New-Zealand they are doing outstanding programs because of the partnership development that they have with various stakeholders in industry and the public sector as well as in the health community. We have to look at new innovative ways to advertise and promote and market the good message we have on the side of the angels. That is foremost the most important aspect. I'll give you the reason why. In 1998 we did an analysis of the 5 to 10 per day program in Canada and we had 4% brand awareness. We did no national advertising, we could not afford it. In Canada we have a government set program called Public Service Announcements: for every hour of television we have 30 seconds of advertising that a public service agency can access. We do so with our 5 to 10 a day message. We partnered with ... Cancer, we put the 5 to 10 a day message out, we get about 5 to 8 thousand airings of our television PSA per year and our awareness has gone from 4% to 55% with the consumer. We can do this and we can compete because of the policies set by our government to enable us access to the television stations. This type of vision and focus towards smart policy that can deliver our message to the market places is a key for other national governments and national groups.

What is next? Taste is key within the culture. How do we reengage taste and what do we need to do to achieve this? For those from the Health sector, work with the industry. Industry is working on innovations around taste. How do you make product that is more tasteful? We've gone to that big beautiful strawberry that may taste a little bit like cardboard –not saying from any country- but having said that industry is now going back. We are moving away from the big beautiful and back to

the taste, something that really bounces in your mouth when you eat it. Work at developing public-private partnership, everything that we are doing here today is key. Take your industry partners and work with them; industry is not bad especially fruit and vegetables. For God's sake we are on the side of angels! Let's work together and try to find that solution. Looking at the global trends that can support, they are out there. The trends that we are seeing in various countries let's leverage them back in our own national environments, and as a group (...) let's stop looking at the stars in isolation, as a group let's look at the stars together and let's start talking about what we are seeing in those stars as a group, and try to focus it all in one common message and hopefully that can bring support back in our own national models. And again looking at the issue of access this is both a public and a private issue and we have to work at it together to find solutions. We keep talking about health and we keep talking about the supply chain and this leads into the work of Laurette's Think Tank: we need to find clear levers and drivers and the core elements on where health fits on our supply chain for fruit and vegetables. Industry needs to understand how do I actually take health and move it forward. Because even though we talk about it, even though we say "we have an integrated approach, we have to work with the partners as an industry of vision", we come back to the first thing I said at the beginning of my presentation: we are fragmented, we compete against each other, even apples against apples and at the end of the day we deal with such a small margin to get any value or return back to the producer whose vision is "I have to feed the family, I have to push the product to the system" and in many cases they lose sight of everything beyond that. So how do we bring the fragmentation together and work in a common vision to hopefully increase consumption for everyone's better health?

(...)

Q & A

PUBLIC (from WHO): I am going to bring you down to earth from being up with the angels. (...) I agree with you about the global pallet and about the increase in unavailability, but it also has the other side of the coin. For example small developing states and countries in Africa are now producing for the Canadian pallet and we are finding places like the bread basket of Africa is not eating its own fruits and vegetables because everything is going to the developed world. This does not only lead to the lack of availability but it also drives the prices up because now you can buy Jamaican bananas in the UK cheaper than you can buy them in Jamaica because of this action. My second point is also with regards to tourism driven availability and a small island developing state for example the Caribbean changes its pallet to suit tourism that is coming from North America and therefore they are getting production which is North American-taste driven rather than the traditional. Plus the competition of the tourists that pay x dollars as opposed to the local who can not afford that. I wanted you to comment on these sides of the angels.

R. LEMAIRE: On the first point there are really two issues when you begin to look at the developed countries and the drive of finding source products from these developed countries to meet the needs of the developed world. We are a global market place and as I mentioned earlier many northern countries and even countries that could sustain themselves on their own production base are relying more heavily on product coming from other countries around the world and in many cases developing countries. Two key elements that we have to look at and I think you do have to separate them because within a global economic model there are potential benefits back to the primary producer who is producing within that developing country for these developed markets. And as we see the future move we know that many countries are migrating away from their agricultural base. Right or wrong? And rely more heavily on these developing countries for their source of in our case fresh fruit and vegetables. This is only going to get worse from your perspective on the production base migrating out of the country, increasing costs, creating a lack of opportunity for access and price for those local consumers. At some point there will be potentially that balancing point that will bring the value and/to the groups that are actually in production and the industrialisation of that industry within that country so that more will benefit from the production basis. Does that make sense? Relative to the goal at the end of the day and again forecasting, we're all crystal balling here, if it does move forward, you'll look at various countries that become an agricultural power that whether they are producing for export, the volume of people that are employed by that agricultural base benefits the base economics of the entire country. That model has not spun out yet but the potential is there. That is the first point, for today that is an issue. Definitely we do see some price variances that occur at a local level in developing countries and that comes back to that discussion earlier. This is something we have to look at between public and private. We tend to fragment it and we do not necessarily develop policy in a cohesive way. We have policy that tends to be developed in isolation and the more we start working together from industry perspective and public perspective on policy, the potential is there to find more solutions to address the immediacy of some of these issues.

On tourism, I have been to Jamaica. (...) Tourism will continue and again what are the economic values of tourism inputted into the country in relationship to the price point that are being inflated because of tourism coming in? I do not have that data. You have to look again on an economic level the potential that there is increased cash and value coming in because of the tourism and without it would it be even more dire straits within the community? Again I do not know and that will be data that we will have to look at.

L. DUBE: I just want to add something, (...) food-for-thought not answer. I think that we need to look at angel as being independent of evil. I will be talking about the Think-tank we hosted and associated events and someone from Guatemala was

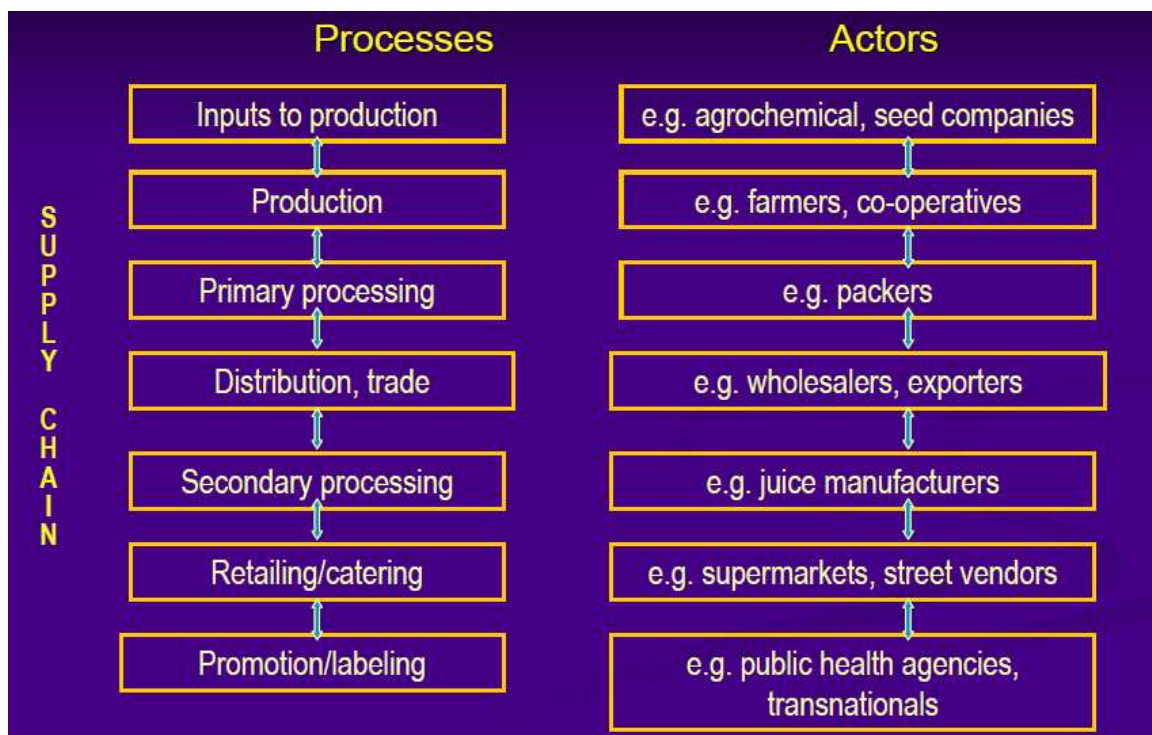
talking about all those great developments, corporative and so on now helping building capacity and economic growth and helping the small farmers to compete at the international level. That was the reason why we had invited that person, but the person was also a nutritionist and he was telling me that all those great fruit and vegetables are going out for export and meanwhile we have what we call the "junk food" being dumped inside. I think that whether it is us as consumers or whether it is government in developed countries and developing countries, I think that the decisions have to be... we talk about health and economy convergence, we can not look at health outside of taste and as a consumer we can not look at economic growth in a developing country or in a developed country for that matter without being more and more aware of decisions that are made on the economic side do have health and social consequences and conversely so that is why fruits and vegetables may be on the side of the angel but as we know since the fall of Adam and Eve both angel and evil are driving human organisations and government behaviour.

Value Chain Perspective

Corinna HAWKES

Le Pouget, France

(...)We already heard about fruit and vegetable supply chain so what I want to do is to set out an approach on how and why we should be considering supply chain to much greater degree when we are designing promotional efforts for fruit and vegetables consumption.



We have already seen a fruit and vegetable supply chain and this one is from one document that Ron Lemaire provided me from Canada. Basically the steps and actors in the fruit and vegetable supply chains that take fruits and vegetables from farm to fork and is a very dynamic supply chain. The key thing about this supply chain that we almost forget is that there are interconnected so that means that change in one part of the supply chain has impacts on the other parts. These are boxes on the figure but there are not boxes that just act independently. If you make in change in one that has an effect in the other, which is very important to keep in mind. Even if there are different types of supply chains broadly all chains have the same basic steps and a range of different actors connected with those steps. You can see on the Figure that the supply chain works based on demand driven which is why the arrows are in both direction even from inputs production to production, primary processing, distribution, secondary processing, retailing and promotion and labeling. You can see the actors listed on the right.

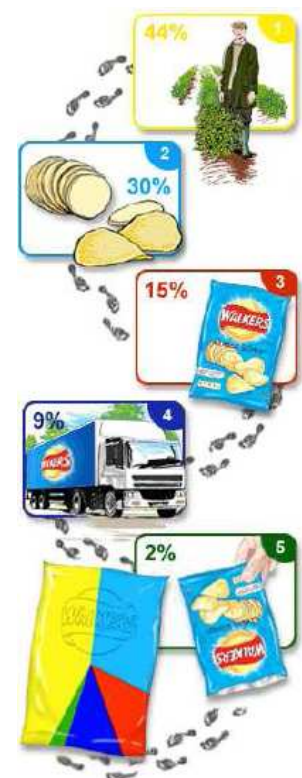
There are a lot of reasons for mapping and analyzing supply chains. The supply chain is actually a form of analysis it is not just a question of a description. If we look around we see that supply chains are often used in many different ways in the fruit and vegetable industry. For example, they are used in Supply Chain Management by businesses. It is an example of how you can map what can determine the value chain rather than the supply chain. Again a Canadian example, when you put value of sale, you put the costs for the losses, where the profit can be made, it is point in the chain. If you are doing this you can identify where costs can be saved, efficiencies made and profitability gained. This is one reason for mapping supply chain.

Another reason is Quality and Safety. You see increasingly regulation authorities including the European Commission and governments throughout the world using mapping supply chains in order to try to identify points where food safety can become an issue where quality control is necessary and in order to maintain traceability. This is an example of how the different place of entry of food bound disease in the supply chain for milk and grapes and raisins from production process and marketing transport consumption. This is taking the whole supply chain approach to quality and safety.

You can also take a supply chain approach to procurement where we see public sector procurement identifying sources and mechanisms though mapping the supply chain. A generic example is from the United Kingdom governments where they just generically mapped supply chain to public bodies in order to try to identify sources of food.

We also see few supply chain approach applied in agricultural and international development circles. We see it applied in the sense that we are asking the question: How can consumption and the food-consuming industries affect production? We talk earlier of the fact of consumption in developing countries on developed countries that is exactly what these academics in the sense of doing these change in map dynamic as the effect of supermarket of green bean consumption in the UK in Kenya. This is comparing the wholesale change with the supermarket chain. Again mapping the supply chain in order to understand how consumption affects production.

And we see supply chain used in another way to do with environment and sustainable development. The question here is how consumption/food-consuming industries affect the environment along the chain. We see this now particularly with carbon foot printing. I know that the company "Doll" is now aiming to have a zero carbon footprint. On the image of Walkers Crisps is showing here that 44% of carbon is coming from production, 2% from packaging and so on. It is a way to say we take the all supply chain and we look at the environment of foot print of that supply chain.

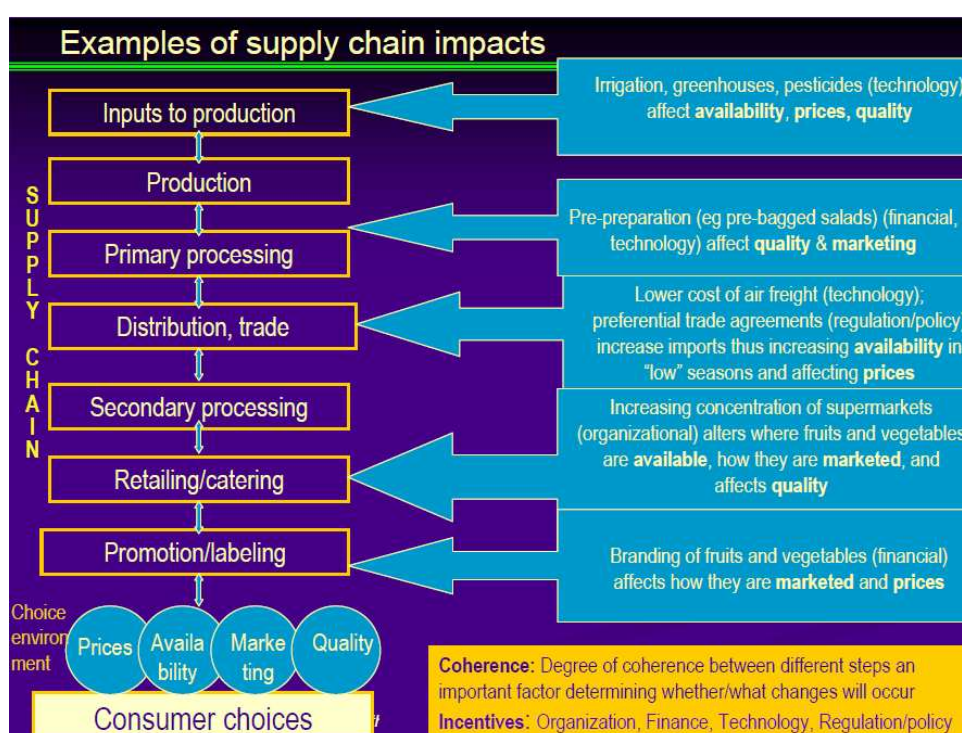


In other words tremendous number of uses for mapping supply chain and analyzing supply chains but what about consumption?

We barely see supply chains used ask question about how to promote consumption from a nutritional-standpoint. We see for the food safety standpoint. We see it for certain extent of procurement where it stands to aim to sort healthy food for the public demand. But basically supply chain analysis applied to issues of production and environment and business value, rather than saying what we can learn about the supply chain in order to better understand how to promote fruit and vegetables we should immediately start thinking about apply supply chain analysis to consumption from a nutritional-standpoint. This is for the basic reason that supply chain affects consumption of fruit of vegetable because they affect the environment in which consumers are making choices about the food that they eat. It affects availability, quality, prices and marketing and the presentation today is showing how important there are in affecting consumer choice about F&V even if there are many other cultural, social etc. factors which are also important. Internally it affects accessibility, affordability and appeal and desirability and that is what consumers choose.

Another reason why supply chain is a good idea is because systematic reviews conducted by *Carole...* and others show that interventions to promote fruit and vegetable consumption work best when based on a clear framework which supply chain analysis provides and have multiple components which the supply chain approach makes.

To illustrate my example of how and why the supply chains have impact on the consumer choice environment. On the arrows you can see the effects:



All of these variables affect prices, availability, quality and marketing. Basic and very simple things as the technology are extremely important in affecting product availability and prices. On the primary processing the things used in pre-preparation affect the quality of the product and the way it is marketed allows branding for example. Changes on distribution of trade, the lower cost of air freight, the use of preferential trade agreements have affected availability and prices in different seasons. The increasing number of supermarkets in organizational factor also alters the availability of F&V and marketing policy. And the branding of F&V on the marketing side with the financial affects on F&V on how they are marketed and priced. So this quite basic stuff why the supply chain operates affecting the consumer choice environment.

What is the degree of coherence is very important. The example I gave are really affected the availability of pre-processed of F&V as taken the green bean example which are cut and packaged. The use of the technology allows the processing technology, the low cost of airfreight, and the trade agreements and the increasing costs of supermarkets where is the green beans, the ability to brand on a packet have all affected the availability to out-of-seasons vegetables. This does not happen on its own but this happen because consumers did not just decide that this was what they wanted. There was a whole coherent series of changes on the supply side which made disincentive points for change so when see change happening on the supply chain it is because the change is in the components the different steps of the supply chain that are coherent with each other and create tipping point for change which is exactly what we need to do from a consumption-standpoint.

The other key point is that the different factors that create changes in the supply chains can be characterized as incentives. There are four types of incentives that I used on the supply side:

- the organizational incentives e.g. the degree of concentration in supermarkets;
- the financial incentives e.g. the incentive to see profit;
- the technological incentives e.g. the technology that is there and the one that is incented to adopt;
- and regulation and policy very important in driving changes in the supply chain.

All of these factors create incentives for the supply chain to behave in certain way so it is changing these incentives that are so important if we want to make the supply chain better for health and importantly also to remove the disincentives to change.

I would argue that supply chain analysis contributes promoting F&V consumption provides a systematic framework for identifying incentives in the change and disincentives in the change to an improved choice environment. What do we need to do? What incentives do we need to put in place? What disincentives do we need to remove in order to improve affordability, accessibility etc? It is an analysis that

provides solutions that can create coherence throughout the supply chain. We talk a lot of our marketing of our promotion but when we talk about marketing we can not just say let's have the supply chain like it does and then just stick on a bit of extra funding on the promotion. We need to think how the business interests are relying along the chain so that they want to promote so the incentive is there for promotion. At that there is a convergence of interests and some of the evidence shows that F&V campaigns are much more likely to succeed when there is a weal of business interest to creating that change whether it is the producers that want to promote, the consumers have the incent to consume and were the marketing elements along the chain are working in coherence. So convergence and coherence are absolutely critical. What that can do if you look historically is that when we have those coherent changes along the chain we getting to endpoint for sustainable long-term changes in the supply chain. By doing this we get the change in cultural norms which are what we are really willing to change when it becomes cultural norms to consume F&V because that is just what we do. But supply chain analysis is also extremely useful because it can and should be applied to specific consumption issues arising from the choice environment.

These was very genetic outline but in fact applying analysis can be used to solve very specific problems or help providing solutions for very specific problems.

Method of supply chain analysis

- Identify consumption problem &/or opportunity for change
- Describe the steps in the chain from farm to fork
- Describe the organizational, financial, technological, regulatory characteristics of the chain
- Identify organizational, financial, technological, regulatory in/disincentives to supply and demand within the chain
- Analyze how in/disincentives affect the fruit and vegetable consumer choice environment
- Identify how incentives could be levered and disincentives removed to better align the supply chain with greater fruit and vegetable consumption

A good point of intervention for the supply chains analysis is to say is the change already taking place. Is there an opportunity where we can use this analysis to promote consumption? And the key point is that we need to identify how the incentives can be levered and disincentives removed to better analyze supply chain with greater F&V consumption. That rather involves introducing one very strong

incentives or removing one or two very strong disincentives which are so strong that they lever change throughout the chain or involve making multiple changes throughout the chain in order to lever it towards health.

I will give two examples to illustrate. These examples come from the United States where my work has been in the past.

Problem1: Low consumption of F&V in low-income neighborhoods in US and arising inadequate availability, poor quality more (specifically taste) one of the major barrier. And essentially there were no incentives at all for retailers to be in these low-income neighborhoods, no financial incentives. The market was not there, people did not want to consume the F&V they had available for taste and there was problems of crime another disincentive to retailers to be in those neighborhoods. At the same time we have a situation where farmers are struggling to find secure markets.

So a program has been introduced in the US to try to provide incentives for retailers to come into those neighborhoods and those retailers were the farmers. The Farmers Market Nutrition Program is part of the women and infant children supplement nutrition program in the US which serves between 2 and 3 million each year. The Farmers Market Nutrition Program added coupons on to the benefits -there was a separate program for elders as well- and those coupons had to be redeemed at farmers market. So this is essentially “free” F&V. As the results of this, the recipients of this program went to farmers market and used those coupons and created a fantastic example of convergence.

In one program it created a consumer demand that was need but it also created a secure market for the farmers who became the retailers. In fact it created a shorter chain and convergence along that chain. What farmers liked so much about it was that it was a secure market because every week the consumers would come and buy F&V from them. So the incentives to invest in distribution which is always a major cost were there because of the secure market. And there was as a result a greater availability, affordability of F&V and limited evidence does suggest that the program has promoted consumption over the longer term and of course new markets for local farmers.

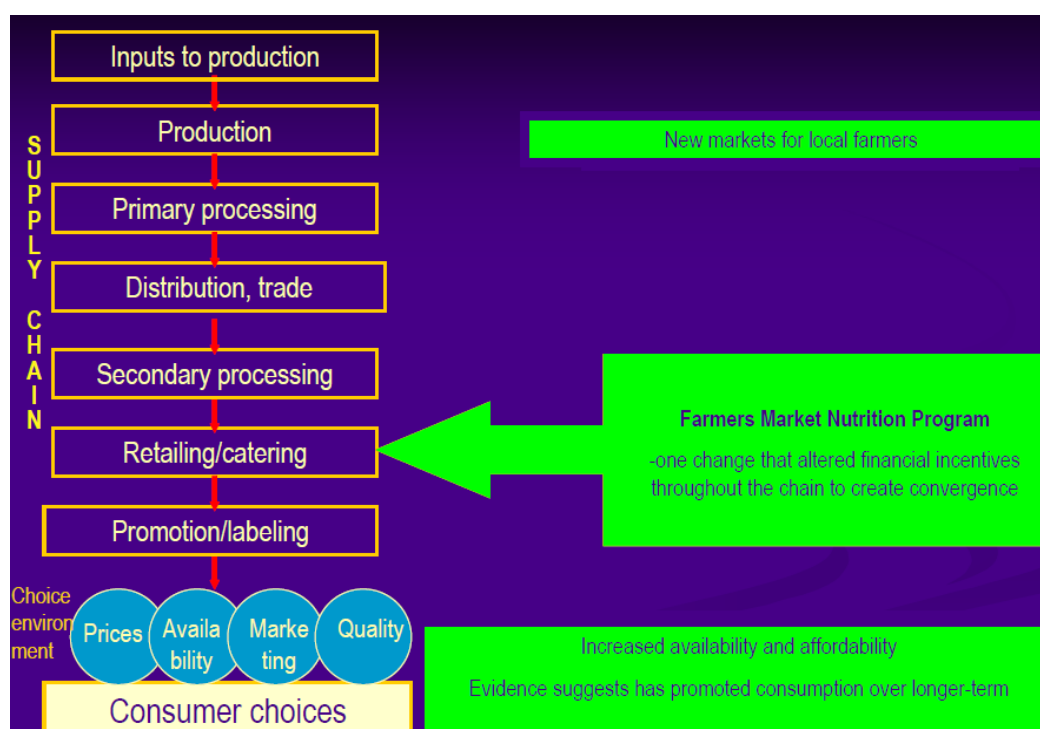
This is an example of what a single program can create convergence along the supply chain. But, it is not always so simple.

Problem 2: Low consumption of F&V among school children in US and again poor quality (taste), unpopular with children and extremely poor provision of school meals.

So we have got this great idea of local farmers struggling to find secure market we have got kids in the school that we want to feed with F&V. The program was not so simple. Huge challenges in doing this, it was not like The Farmers Market Nutrition Program at all. There was just one big logistical nightmare (...) because of

disincentives throughout the chain. The school is essentially the retailer and dissatisfied with budget restraint, centralized school meal provision, federal procurement guidelines. There was every kind of disincentive you can think of to get in F&V from local farmers in school because of the straight jacket provided by budget and regulations and lack of technology. For example there are no refrigeration and cooking facilities in school kitchens in many US schools and probably most US schools. There were no promotion abilities for encouraging school children to consume. And probably the most major problem was delivery. If you are talking to local farmers about delivering from the single local farmer to the school when you have a huge school district it is just a nightmare of logistics. All these kinds of disincentives alternate supply chain and coordination.

A lot of people tried this and it did not work because there were so many problems. The program that worked in my analysis was the program that took into account that all supply chain in developing the promotional program. Just some examples about how those programs work:



Because of the problem in primary processing, the processing became the responsibility of farmer or they took on board the local cooperative in order to solve the process in the F&V which an organizational change which created a financial incentive.

On the distribution side, schools said that what they do is find farms on existing delivery route for their school meals so they can just deal with one extra drop off/pick up or they dealt with just a single farmer which was simpler but there were some problems of volume or they dealt with farmer's cooperative so there was just a single pick up point.

On the school side there was a realization to the size of the school that there was an assumption that F&V were going to be more expensive from local farmers that is not always the case the problem is more the delivery costs that is what make it more expensive so let's find where to cut the delivery costs. Or if there was the case of a high and organic farmer that was being the local farmer it was better to buy the cheapest diet from that farmer that also made it perversely possible from the pricing point. Strict procurement guidelines in the US always around them was to procure from individual famers which meant that it fall below if you order less than an amount per year and have to cohere to the guidelines or you can limit the procurement to say 20% which is also allowed in some district.

So what these schools were doing was ask themselves how we can get these changes along in the whole supply chain to get this program working. We see that some schools hade no refrigerators in the schools and the products required refrigeration or cooking such as apples, using salad bars very popular in the US. Or some investment was required for refrigeration in kitchens.

Along with this the program that has been successful was combined with the education in the classroom because schools are actually ideal places for promotion through education with the 5-a-day also "buy local" campaigns. So, there was a kind of convergence with education in the classroom, 5-a-day campaign with "buy local" campaign" working together.

So we see what happened with these successful programs is that they made organizational changes, they made changes to financial incentives, they made changes to the technological incentives and to the marketing incentives in order to lever the supply chain towards making these programs work. And the programs that have work are working very well the results in getting fresher and tastier vegetables to children who now like what they are provided because of the taste and freshness aspect combined with the education and the convergence with the farmers.

So these are examples how working throughout the supply chain can create changes over the long term that really are needed. So when we are thinking about promoting the consumption of F&V we need to be thinking about how to lever change throughout the supply chain by finding opportunities. The way to find opportunities as I said earlier is to identify challenge in the chain and indentify whether that challenge matches up with the challenge on the consumption side. For example farmers had problems, consumers have problems let's try and create that convergence. So identify challenges that can be solve through this analysis and through this approach I think is a good way of finding opportunities. Also if there were changes going on in the supply chain, in the policy, in the technology or the financial aspects we need to convenient that change to try to promote consumption and convergence that way.

In the European context at least there is such opportunity that is currently rising up at the moment which is the policy reform of the F&V regime part of the agricultural policy in the EU. The policy reform of the F&V regime is particularly interesting

because they are trying to create convergence. The specific aims in quote are to: “improve EU F&Vs market orientation”, “reduce crisis-related fluctuations”, “protect the environment” and “increase consumption of F&V in EU” though increasing funding for promotion to children, and a school fruit scheme. These are examples in order to increase consumption through those policies but are they really? This is the question we need to look at. When I read through the documents what strike me is how uncoordinated there are and forgive me if people have a different view on that. On the one hand they want to increase consolidation among producer organizations in the EU as a way of fighting the power of the supermarkets as way of working with supermarkets is wrong mentioned this idea of scaling out produces in order to coordinate better with the retailing sector and they want to increase market orientation etc. Then on the other side, they want to add funding for promotion to increase percentage promotion as wells as school fruit scheme is currently being discussed. But the issue here is whether the change in the supply chain would that actually be conducive to school fruit scheme, would that be conducive to that promotion or whether there are actually just separate things by no promoting, no fruit school scheme but a change in the supply chain. I would argue that if you want to increase consumption we need to make changes in the supply chain that will make the business incentives for them to be in schools. Make the businesses incentives to be there for increase consumption through promotion as opposed to look at promotion as a separate component, we need to integrate it into the chain. We were talking earlier about fragmentation and consolidation in this chain and I do not think the EU approach saying that we need increased consolidation among produces in this chain is one way of approach. How are we ignoring the fragmented market and perhaps we can lever the fact it is a fragmented in order to build local chains for local promotion activity. So I will argue we need to look at both of the global F&V supply chain and at the local supply chain if we are going to lever it for better health to really build coherence in convergence between promotion and changes in the supply chain.

Q & A

PUBLIC (Australian man): (...) As you go through the harm chain you are presumably as you look at the organization and individuals involved in that chain looking at to do business with them to influence that behavior in some ways. Any thought about how do you go about doing that? You know the local farmers who are going to deliver to the schools or the supermarkets that are going to stock the fruits in place or whatever it might be. How do you get these stakeholders of various sorts to change that behavior?

C HAWKES: This goes back to my point about incentives where the question is who takes the lead in deciding or implementing changes incentives. First of all when there are incentives that need to be changed somebody need to take leadership on that. For

example if it was changing the behavior of a supermarket the supermarket would need to have financial incentives to do that perhaps if it was a promotional activity. It is complicated because if you are giving the supermarket a bit of financial incentives, if it comes for the producer that might be bad for producers so that is not good convergence. All these kinds of issues make it complicated. But I think that the key is to change incentives and not to see it as financial but to look at it from the total organizational and policy standpoint and to see in all those frameworks. Those four aspects are important. The question is who is going to take the leadership in trying to change those incentives and to create convergence and I think the real issue is for the one in leadership.

Innovation perspective

Robert-Jan BRUMMER

Örebro University, Sweden

I will do this innovation perspective of F&V especially in the framework of the public/private partnership. (...) The link between Sweden and Denmark is a brilliant example of public/private partnership, not only because it is build as public/private partnership but also because it has stimulated innovation in public/private partnership across the two countries especially the research environment in both Denmark and south of Sweden. (...)

My very simple way of looking to innovation is actually divided in two parts: the invention part and the innovation part. Very often innovation is a very blurred topic because people thin that creating an idea is also innovation which is not, that is invention. Everything from converting money into knowledge is the invention part. Creating money from knowledge is the innovation part. It is very important to distinguish these two parts because normally there are a lot of people working on inventions and a completely other team of people is working on the innovation part and that is why a lot of money converted into knowledge is not converted into money again. The key to really create an innovation circle is to have a team with people from both invention and innovation parts to create together what kind of knowledge should be created and what kind of knowledge is needed in the future and then it will work. That is what we have worked on in the last 6, 7 years in Holland and also in other countries.

It looks very simple that all knowledge is converted to money but it is not that simple of course. You are probably familiar with the innovation funnel that shows that from the left to the right from the invention part to the innovation part a lot of ideas are actually lost. This is because normally in this innovation funnel there are only a limited people involved from the innovation part. How you can convert and valorise you idea into money. (...) Normally only limited people of the innovation part are involved in this process and a lot of spinoff possibilities so knowledge which is created in funnel but can not be used by the innovation part but by other partners by other people is actually just going somewhere but not really in the innovation process.

The typical example which is well-known also by economists in the literature is the Xerox Company in the US where if you sum up all the spinoff companies from people who originally worked at Xerox these are much bigger than the Xerox Company itself. But Xerox has never been interested in having these spinoff things by themselves so they lost all this money in capital. For example the knowledge on how to create hard disk that is from people who worked at Xerox.

It is even more complicated if you look at the money. Those who support the invention to innovation process are often different parts in a different process

innovation invention transition innovation. That makes it even more complex. One of the key to have a whole circle going around from money to knowledge to knowledge from money again is to have also the capital involved from the beginning. If you are working in an innovation process you should think already of who will support you with capital to go further on in this innovation process.

The public/private partnership concept is only made by the academia industry and government working together to create this sort of innovation circle invention/innovation process. Somewhere the consumer subject should be in the centre because the consumer should always direct the process. This is still in an indirect way because there is some communication between the consumer and academia industry and government but it is indirectly either by marketing or by politics or even and this is a one way academia by education to the consumer. So this is a little bit public/private directed in this communication.

I want to make it a little bit more complicated but perhaps even easier to understand by seeing how sometimes it goes wrong. A very dogmatic scheme on how knowledge can be valorised.

In the food and nutrition field especially, a lot of the knowledge which is created by academia or other research institutes could both be valorised towards industry as well as to Public Health. The consumer should always be in the central position because at the end industry will only make product which will be purchased by the consumer so in the consumer in some way directs what the industry is doing. On the other hand the consumer is paying tax and gets health care back so the Public Health should be also in some way either by politics or by another way directed by the consumer.

One of the pitfalls in a lot of public/private partnership is that very often the public part of the public/private partnership is either the more trade economy part of the government or the more Public Health welfare part. They have a very completely different interest in what directions the knowledge is valorised. My experience of working in a public/private partnership only was industry and especially the economic part in the agricultural department. This part of government was only interested into support valorisation of knowledge towards industry and not at all to Public Health. But very often this is a very synergistic process where you can both valorise it. For example we did some research on folic acids and hearing and showed that folic acid was able to attenuate the loss of hearing when you are ageing, that is a great thing but industry could not do anything with it because you can not put it on a package. It was completely useless for industry although is very useful for Public Health. In Sweden e.g. the problem is bigger because you have the local government, the country government, the provincial government and the state government which are directing Public Health in different ways.

So we tried in Holland to see more or less how we could build a sort of integrated knowledge in innovation chain.

At the right this is the industry which has to create the money at the end, the upper right of this panel is especially the development part and left is the research part of research and development of industry. The new part in this integrated knowledge chain is a sort of interface between university research and the industry research and development. That is new block that is formally called for Wageningen Centre for Food Sciences and since two years The Top Institute Food and Nutrition (TIFN) in Holland and this is a partnership for both industry and universities academics and also Contract Research in organizations. The colours blurred into each other are the interface. What we are trying to do is from the knowledge which is need here to create this money we try to converted this to the process of research here. The questions and the problems that should be answer are transfer to university research and into several researches.

The problem is the small and medium size enterprises (SMEs) in between. There are of course very important and very necessary from an economical point of view but there are nearly absent from the research point of view. You can divert it in two parts: the SMEs with high-tech focus more or less creating ideas and knowledge and the medium-tech or low-tech SMEs which actually valorise the knowledge created into Euros. We understand that in a sort of standard conventional system of university the big TIFN research institute in industry does not work for SMEs so we created another sort of dispatch in 3 dimensions for SMEs in Holland as a sort of private interface to create better knowledge directed research.

On top of this is the interface with the European Technology Platform (ETP) Food for Life which was created 2 years ago in which I have been involved especially in the nutrition and health part of it. What we have done there is also in a public/private fashion we created a strategic research agenda for the next 15 years for food and health for the nutritional part but also for the food science technology part for the convenience for behaviour. I have been involved especially in the Research Agenda for the nutrition and health part we created three pillars: brain functions, immune intestinal functions and metabolic functions. This strategic research agenda is a basis for European framework 67 and also for the *Grenster* and we are now part of this tall interface created in implementation program. How you can implement this strategic agenda in the next 5 to 10 years. It is a huge work and we hope it is fruitful.

Another problem and it comes to problem of innovation in functional food in healthy food is this integration between the different parts of the knowledge domains the agro-food nutrition help and diseases and very often you see somewhere a diversion. There people working with the agro and the food and there are people working here and we you really create a good knowledge in value chain you have to integrate this. What is the challenge for food and nutrition and health in the next couple of years? That is very simple actually from my view. If you look at this diagram you have age and the severity of a disorder e.g. atherosclerosis. There is a certain time for disorder to progress to a level that you get symptoms, if it progress further you get a disease and you consult a doctor at the silent phase and if the doctor do not do anything then

you will die. As a doctor, I can do this, I can not see the patient before because it not a patient yet and I can do by nutritional but especially by pharmaceutical meanings to divert this natural cause of disease and they can have an increase of living years. That is what I can do as a doctor and it needs a huge effort to have that natural cause of disease changed. Although by nutrition you can start very early even perhaps before and even if the angle is much smaller that the other one you see that there much more effect.

On the side you have the population an on the bottom the healthy and unhealthy conditions. In the original population less than 50% have these healthy conditions and a substantial proportion of this population have unhealthy conditions. If you can shift by nutrition to the left then half of the population will be healthy and only a small proportion will be unhealthy. But I will let it because we mentioned earlier that is a very segregated market you never know what the consumer eat there are all sort of different consumers and even worth you never know who the prescriber is. If you look at nutrition not longer the doctor is the prescriber even not for functional food. Very often I have seen that the consumer has more acknowledge on functional foods than the average doctor. So this is a very big problem.

You can also see that what goes wrong is that for example if you look at the problem of health heart disease this has been taken parts by Public Health authorities representing the consumer partly by NGO Heart associations and they took up this question of what kind of knowledge should be created and how it should be solved. In general the nutritional question is not taken up by industry which does not have this big R&D potency and is not really taken up by Public Health Authorities either and there is no NGO dealing with nutrition as such. So if you compare it to asthmatic disease for example there is a big difference with heart disease.

To sum up what is another problem in agro-food innovation and why it is going so slowly in my view is that it is segregated innovation chain also. You have the agro part which delivers the ingredients and the full products and you see that in the agro part the cycle speed of the innovation such as very often 8 to 12 years to have a new product on the market while if you look at the retailers 2 years is already very long. There is a completely disingring between the innovation cycle at the agro part and industrial part and the food ingredient and food industry at the other side. It is not only a difference in speed but also a difference in focus. It is product-focused on the agro-side while it is ingredient-focused on the food and food ingredient industry. It is also dominated by SMEs on the agro-part while it is dominated by multinationals very often in the food ingredient industry.

To finish I would say that the situation today is that the agro-food business in is R&D is rather traditional and conventional and perhaps even conservative. In my view public/private partnership can facilitate much more opened innovation processes and there is also new break through.

Social Norms and Culture Perspective

Claude FISCHLER

CETSAH, Paris, France

This is the cover of Michael Pollard last book. Once you have read this, you have got pretty much a good part of the message. The book says: “Eat food, not too much, mostly plants”! Mostly, not only, far from it actually!

We are omnivores and we probably forget or we did not realise until recently that moving out of the forest into the savannah did not mean only that our ancestors could access scavenge meat or hunted animals easily but it meant that they also could access roots and tubers which grew in better supply in savannas. According to Richard Wrangham a primatologist the word the offices are using is fold back food that does not sound very attractive.

If we look at data on how various countries perceive vegetables it is interesting to note that if you ask to rate on the scale from 0 to 10 the healthiness of the following categories of foods in this sample which was not a representative sample but a subsample from a large study we did recently that includes interestingly physicians, teacher of all levels and one third of random people what you get on a zoom in this complex graph and look at just fruit and vegetables we can see that maybe credited to public health campaigns but the message obviously came through because the ratings are very high everywhere. Interestingly enough there are lower ratings in two of the countries which are the highest consumers. This tells a lot about the relationship between perception and behaviour and above all about the facts of telling people “eat this, this is healthy”. We do have other evidence from psychology that actually is sort of puts off people and children in particular.

There are interesting differences for other classes of foods, not nutrients. It is difficult to understand the perception and uses of vegetables if you do not look at it in comparison with meat. You can see that meat is rated healthier in France, in Italy than anywhere else and I would like to point out something even more interesting in my view. We have a subsample of physicians as I said, the ratings of the physicians should be heaven and done according to science and knowledge but apparently not so because they match exactly the ratings by the general sample the teachers and the general randomly picked people. The mean is actually the same between the general sample and the physicians if you take it country by country. There is not only one knowledge and knowledge is not unique at least when it comes to nutrition and food interested.

Another thing which comes in contrast and we just saw that healthiness were plants in general. We are talking about a very diverse thing here that we just dumped together in one category. We are talking about root and tuber; we are talking about stems and leaves and without forgetting the potatoes all are vegetables (...) what makes the picture a bit more complicated. People are pretty well convinced that

vegetables are good for them and fruits as well. Now it is interesting to note as early as 1941, psychologists had already observed that disgusted and stronger versions were almost exclusively at least mostly associated with animal foods. Now how is it that we are being told constantly that children spontaneously won't go towards plant-food? Or that even adults at least in certain cultures simply won't eat them? Even in France where people eat mostly a lot of vegetables you can hear people when receiving their salad bowl saying "I don't eat grass!" The story is obviously that there are various different attributes to meat and plant. Meat is the adored and the most aborted food in the world. If you look at the human relations area files the data set of all ethnological observations you find that there is not one culture where –there might be one exception- meat is not associated with celebration, affluent prosperity, sexual strength, life and so on. On the other hand, meat is associated with taboos and religious prohibitions.

This is from an ongoing research program in which we had the opportunity to try out an idea while we were doing focused groups. We tried to replicate Venetian redes experiments of 1664 trying to test the spontaneous generation hypothesis. We put a piece of beef or more precisely veal in one pot leaving it open and another one in another but with a lid on it trying to see what would happen in the pot with the lid as opposed to the pot without the lid. That showed that there was a maggot in the lidless pot and not in the other one. We asked people to do a fourth experiment asking them what would happen etc. with a roast beef on one side and a lettuce on the other case. We were flabbergasted to find out that in very tiny sample –absolutely not representative but we are going to extend this survey to representative samples- people thought that it will not make any difference whether there was a lid or not, when it is meat you get worms (and it smells) and when it is salads it just dries up or melts down and may stink a little bit but nothing much happens. And there is other evidence to the fact that there is a strong difference, opposition, in people's minds between animals-food and plants-food.

In a questionnaire in which we were asking people how dangerous is it to consume the following products after several days in the refrigerator. The result shows that on a scale from 0 to 10 what happens is that there is really clear cut radiant between high risk and low risk. To make it short on the low risk side there are plants and on the high risk side there are animals.

Another thing that I did about 20 years ago is on how things change and spread. We have a national institution in France that tends to be imperialistic by the way that is the Michelin Guide. The Michelin Guide has for instance about 20 restaurants in France that are distinguished with the high valued 3 stars. What I did at that time was looking at a collection of Michelin Guide since the 1930's each restaurant have changed now but at that time each restaurants that had 3 stars were allowed to list three dishes from their menu so you could look at the menus, dishes and ingredients. What I taught was before 1965 there was not one case where the name of a vegetable of the word vegetable was mentioned. This was for a number of reasons and not only

because people did not eat vegetables or because “haute cuisine” did not care about vegetables, that is not the point. The name of the dishes were coded and standardized so names like “*Poulard de Ste Alliance*” etc. did not mentioned the ingredients, they did not list the ingredient the way they do now in what I like to call “karma cuisine” in the menus particularly in North America but it tends to spread. What happen is that fruit and vegetables began to appear more and more often in the late 70’s in the early 80’s. In 2002 there was an important event. Alain Passard of the 3 stars restaurant “L’Arpège” declared he had have lots of joys and creativity working with meat animals-food but he was still serving animals-food (...) so would not call it vegetarian by any standard but he decided he was going to focus now on vegetables. He acquired a farm in the west of the country from which the vegetables are brought in by faster TGV train every morning and you can eat probably the most expensive turnip of radish that you will ever experience at that restaurant. The point is there has been trickle down process in terms of perceptions and the “haute cuisine”, the restaurants and the Chefs have played a part in it. It was not enough actually to increase actual consumption but consumption of F&V in France has remained level and if you look at some of the issues that were brought up by the previous speakers for instance the issue of convenience which I think is absolutely essential you find looking at the stats that consumption has increased whenever convenience was present. That is the frozen market, there is one chain in particular of quality frozen food that has known consistent growth and we can say there is message in there. Plant-foods have in particular handicaps because they were fold back foods and I remember stories in my childhood that always began with “the family was so poor that they were eating roots”. One the other hand some of the core food of the world are roots (tuber potatoes, carrot etc.). Animal-foods are adored plus they are less risky in perception and perhaps also less attractive and perceived healthiness does not necessarily increase consumption. The key issues are certainly convenience, price or income in relation to the convenience ant to the availability etc. I think we should not go too much into health issues.

This cartoon says that people are leaving the thinking ship and there are saying it is probably all for the best because meals where hopefully rich.

Q & A

PUBLIC (Mariano WINOGRAD): I am from Argentina the biggest meat eater country of the world and the question for Mister Fischler. In our country meat is in reality a politic problem because the government and the cultures consider that big quantity of meat is a sign of richness, of welfare. We say that instead of 70 kilos per person a year we would eat 50 kilos per person a year of red-cow-meat. These 50 kilos we can not change for 60 kilos of fruit and vegetables then we were able to get the WHO recommendations. Do you know in Argentina think what suggestions in a country as ours?

C FISCHLER: WHO approved people were turning from switching from grass-fed-meat to fried potatoes. I really do not know, this is something for a nutritionist and I am not sure I can take sides on this one. But one thing that is important is that I believe that as far as know Argentina has grass-fed-animals for a larger part so that is comparable to Europe and it not the same chain as in the US with the corn and the feed larts and the nutritional compositions of the meat and the fat and it is probably quite different.

PUBLIC (American woman): I have a question that comes up in most of the presentation and particularly in Corinnna's. There was a lot of emphasises in the value chain perspectives towards farmers market etc. and my question is about restaurants. Eating out is growing and we did a study a couple of years ago that was actually sponsored and motivated by the Produce for Better Health Foundation in the US and we talk to marketing menu development directors that the largest chain restaurants ranging from fast-food to sit down kind of range. The controversial answer that we get we asked about healthy food in general but F&V also specifically was they do not see a market for it and that do not see changes in interaction. So when talking about incentives the question is: Is there some leverage point that anyone as thought of that moves us into that direction and whether the leadership comes from?

R LEMAIRE: We have actually done some research recently in Canada around meeting some of our key food operators in distributors. Corinna's outline on the supply chain and value chain links to the food service perfectly and it does not matter if it at the retail level at the end or food services at the end. One of the biggest challenges when you get back to food service for produce still we are not centre of the plate. So the business still drives how they procure and purchase products. And when you go at how they are actually structured within the supply chain and especially moving more to a large broadband distribution system where these broadband distributors if you are looking at local investment into that system it is more and more difficult for the small producers to engage. We have a group across Canada and there were several anterior smaller groups based on different cities and

these groups are trying to work with local producers to get them engaged with local restaurants. Even at a local level it is interesting because we go back in some of the core points we were talking about on challenges at the very beginning around distribution. Just to get product in as an example there was a chain restaurant in town that said they love to buy local but there are few elements they did not have as consistency, price and quality that they can rely on because they only 3 or 2 menus that we work with per year so they have to ensure the products are always available because their customers would not accept that they do not have on type of vegetables in the week. So it is a real challenge and how actually people are looking at it I know for example from an industry perspective.

C HAWKES: I think this is another example where the restaurants are kind of captured market if you like or fruit services for example in schools. In is an example in where creating an incentive in consumer could help driving incentives on the producer side giving them logistical problems. Sometimes, given those examples, with mainstream fruits or services providers have consistent menus rather than special menus that promote fruits and vegetables. Another example was when I was in Canada last year. I love the work that has been done in France by the PNNS and the National Nutrition Promotion Organisation but I came across yet another example where I my local Carrefour at the café attached to it they were doing a promotion for fruit and vegetables eat-5-a-day along with these special menu items which were healthy menu with fish. I was very pleased by this and so I chose the healthier item so I said I wanted the fruit and vegetables and they told me that I have to pay extra for that. I am a price conscious consumer and I thought that I will not have it; I had to think twice. This was an example of if the incentive there was to have them free on the side with this dish would have been increasing incentives about the change. I think the world of incentives within the restaurant setting is underexplored and should be explored a lot more.

PUBLIC (Woman form University of Puerto Rico): I am concerned and surprised that none of you mentioned or remember telling about the increasing concern about food insecurity in the world and how that is going to affect the consumption of fruit and vegetable which as you mentioned is one of the most expensive items in the diet of people because of the cost of distribution, production, marketing and all those factors. So how do you think we can deal with the situation to increase the consumption of fruit and vegetable in a difficult situation that we are facing right now?

L DUBE: It is a challenging perspective but I do believe that more and more soon we will need to look at the three facades of food and healthy diet which are over-consumption, under-consumption and food safety. In some of the continuum perspective so that part of the problem of food insecurity that we are going now it is bio-fuel type of thing but is also for a large part du to the fact that worldwide the diet

is moving toward food toward consuming more. I think addressing more fruit and vegetable in a way that is economically sustainable worldwide we require more and more to look at cross country and global approach to how we create a food supply and demand that is affordable worldwide for all of us. This is the thinking in whether it is in fruit and vegetable or in any other industry has not started to look from that perspective of looking. Canada Trade with some other countries tries to have a more supply and lower costs that will be the challenge.

PUBLIC (woman from FAO): I just would like to make a point on this issue of food insecurity. Most of you know that we still have a very high number of people who are food unsecured in the world. In fact FAO will shortly publish figures indicating that there are still more 850 million people who are in the world that simply do not have enough food and quality diet for an healthy and active life and many of these people do not consume fruit and vegetable. The current rate of food prices that we are seeing is going to have a further negative impact on the quality of the diet for many people in the world and not only on developing countries but also poor people and Europe and America and the rest of the world in general. And part of the reasons why there is a raising food price is not only because of increasing area of land is being given over to bio-fuel production but actually it is the change in consumption pattern like India and China primarily who are demanding more food like meat and so on and you know that to be able to produce meat you need cereals and soya beans and pollsters in order to feed animals. Soon we are going to have to deal more and more with looking at the consumptions patterns that we have at a global level rather than being sort of Euro or America-centric. This is going to be a really big issue and we are seeing many changes going on globally in food consumption patterns and if those kinds of meetings could be a little bit more international and global that it is at the moment.

C FISHLER: I thought I had quite a metaphor of you wad with my last cartoon (...) but let's not have a simplistic picture there are not bad guys, good guys, good food and bad foods because it is not just meat that is at stake there because flying vegetables from one side of the world to the other is not a very good way of functioning either.

R LEMAIRE: The issues that we are dealing with are high complexity we know that. We know eating itself and their attributes start going along with what make you decide what you are going to put on your plate is a complex element into itself. (...)

SESSION 7

FROM POLICY TO ACTION: WHAT TO DO NOW?

Chair: **T. Lobstein**

- Introduction: Moving from policies to action. **T. Lobstein**
- Food, marketing and young people. **G. B. Hastings**
- Parents Jury – a grassroots advocacy program to improve nutrition environments.
K. Chapman
- Controlling the market using legislation. The UK experience for TV and non-TV regulation. **J. Landon**

Introduction: From policies to action

Tim LOBSTEIN

IASO – IOTF, London, UK

In this session we want to spend time looking at how nutrition and public health policies can be turned into real practices and bring about real change.

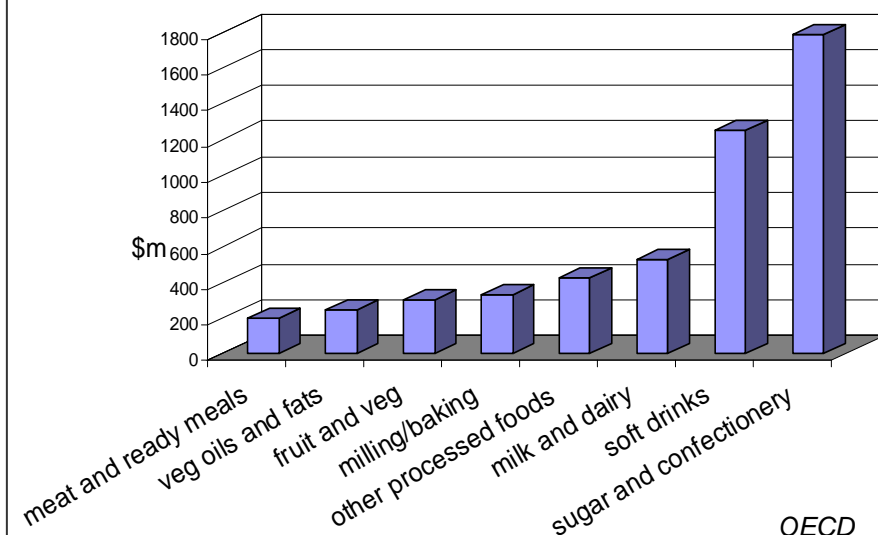
My specific interest is obesity and as you will aware, obesity is on the increase. It is extremely prevalent in countries in the developed world, is becoming very prevalent in countries in transition, particularly in former Soviet Union countries, and it is also becoming increasingly prevalent in developing countries. And as we saw from figures Philip James showed in session 2, there has been a remarkable rise in obesity rates in the last 20/25 years, particularly in child obesity – but in obesity generally there has been enormous increase that is a great concern to policy makers.

What has been happening in the last 20/30 years? What significant changes in society have been occurring? We know that for physical activity we have rising urbanisation of the population, increasing motorised transport, and more sedentary work patterns, and these may be parts of the explanation. The other side of the equation is nutrition, which is of course the area we are interested in this congress.

As you know all over the world fast food companies have been finding new outlets for their products, selling in different countries to anyone who would buy them and mounting great monuments to the present. The picture shows an impressive tower and if you cannot read the language, you can recognise exactly what it is from the symbol.



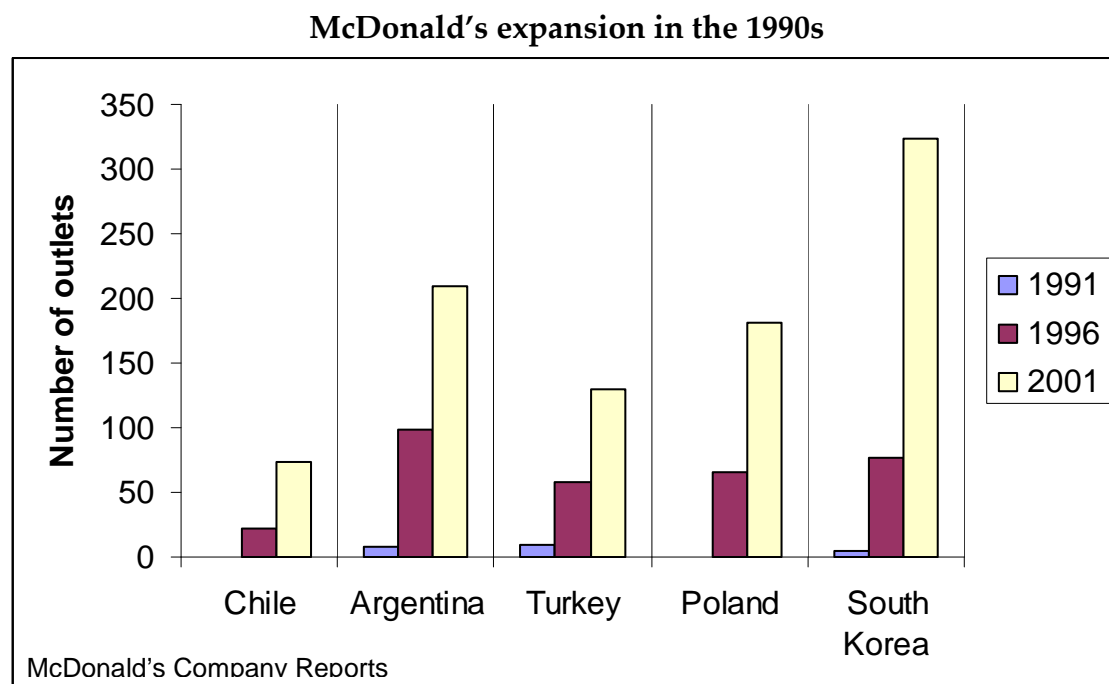
Foreign Direct Investment into Eastern Europe's food sector, 1990-1997



In Eastern Europe, a region that is now part of the European community we have seen a massive increase in investment in food. The big companies are coming in to develop the food sector and OECD figures for the late 1990's show exactly which part of the food sector are getting the

most attention. It is interesting to see that F&V are the third lowest investment sector. The two very large investment sectors are for soft drinks, and for sugar and confectionary products. So the big money invested in Eastern Europe as it is in much of the rest of the world is on these sorts of products. And if you invest you bring down the prices, you encourage sales and you do a lot of marketing to ensure those sales continue.

Fast foods of course have also been on the rise. The figure shows different countries around the world comparing the numbers of outlet of one chain, McDonald's, over a ten year period in 1991, 1996 and 2001.



If you take Eastern Europe, Poland is a good example. There were no stores from McDonald's in 1991 but it shot up to over 60 stores and then over 170 stores by 2001 and now I do not know the figure but we can imagine it is probably off the top of that graph. So, these have been the changes that have occurred over the last 20 or 30 years.

The question is whether health education is an answer to this – is it the correct policy response. We have to think about what education does. We have a good example from the 1970's in the UK where health education was considered the solution. The government produced a wonderful booklet called 'Look After Yourself!' which more or less says what their philosophy is because they are not going to do anything to look after for you. It carries some wonderful advice on obesity: "a practical way to prevent obesity is not to become overweight". So, these sorts of leaflets were being put into doctors surgeries around the 70's and early 80's and it is perhaps not surprising that it did not prevent the rise in obesity.

I want to make the bigger point that the commercial flood of activity that we are seeing is practically impossible to resist; it is very hard for an individual. You can not give advice to an individual simply to resist this commercial flood of advertising, marketing, reduced prices, widespread availability of fast food outlets, snacks and soft drinks and so on. And to tell a child to resist that it is almost certain to lead to failure, which is disappointing for the child and that would probably mean that they would not listen to your health messages again. And it also may widen health inequalities because the people who can implement the advice and resist environmental obesogenic pressures are likely to be those people with the greatest access to resources, to be able to afford more expensive food, to take exercise and so on. And those who are less likely to be able to resist that flood are likely to be lower income. So we have an increase in inequalities if we really rely on health education as a chief policy. Government has recognised this – I think it is true to say that over the last 10 years at least we have seen changes in government policies. Health education is not the only answer any more.

We had a very significant conference in Norway in 2006 on marketing to children and its major conclusion was that “...action is essential” to control unhealthy food to be marketed to children. This policy was reflected again later that year in the European Charter which was signed by over 50 WHO European region member states. Health ministers signed this charter which included the request to “...substantially reduce the extent and impact of commercial promotion of energy-dense foods and beverages, particularly to children”. And it called also for “...international approaches, such as a code on marketing to children” which is a significant step forward that recognises that governments within a country are not sufficient to control marketing to children when you have satellite television and the internet beamed in from outside their jurisdiction.

The European Commission is in a very important position to set some regulations. In 2004 the Health Commissioner gave the industry one year to show reform or face compulsory regulation of marketing to children. In 2005 the Commission softened a bit giving the industry another 2 years. In 2006 the Commission issued the Green Paper which included some suggestions about marketing and last year 2007 its White Paper came out and that too included a piece on marketing. I am sorry to say that its proposal was to keep the existing voluntary approach at EU level and to have another look at the issue in 2010. So from 2004 to 2010 we have seen a long delay. The Commission argued that using a voluntary approach is much quicker because the industry can do it straight away, you do not have to go through a long regulatory process with Parliament and conditions and so on. But if we are waiting from 2004 to 2010 then I am not so sure this was such a quick strategy after all.

In fact the European Parliament itself became more sympathetic recently. One of their committees issued a report on advertising to children which said that even if the evidence was not that strong showing a direct impact on child obesity; nonetheless policy makers should develop recommendations to control marketing. The non-governmental sector has been very influential in this and kept up pressure on policy makers reminding them that children are exposed to these marketing pressures, that children are vulnerable. The European Heart Network produced an excellent report in 2006 in which they held a series of stakeholder meeting and some analysis of the impact of marketing, and that came to the conclusion that marketing controls were a priority. The stakeholders accepted that. My own NGO the International Association for the Study of Obesity (IASO) works alongside the organisation Consumers International to produce an international code and set of recommendations on marketing food and beverages too children, which are now available on the internet. That was inspired by previous good examples, the International Code of Marketing of Breast-Milk Substitutes and the Framework Convention on Tobacco Control.

I want to move on now and pick up three themes from this general overview. We have Gerard Hastings as our first speaker who is going to talk about marketing, behaviour and the lessons we can get from industry about how to market, how to move on from that health education approach to something a good deal more sophisticated in changing people's attitudes and behaviour. Secondly we have Kathy Chapman from Australia describing the NGO campaign 'Parents Jury' which had a major influence on policy makers and is one of the good examples of an active campaign that keeps up the pressure, reminds politicians that there are real people out there and that public health is a real political issue. And last Jane Landon will talk about UK successes on bringing in regulations on TV advertising to children, with a ban on ads to children as old as 16 years, and an important legal definition of junk food.

Food, Marketing and Young People

Gerard HASTINGS

Institute for Social Marketing Stirling and the Open University, LA, USA

If we start to think about human behaviour this is quote from the thesaurus about human behaviour as listed here:

human behaviour

thrawn; dysfunctional; perverse; rebellious;
unpredictable; contrary; unreasonable;
peculiar; wilful; irregular; stubborn; odd;
impulsive; erratic; variable; extraordinary;
fickle; arbitrary; obstinate; changeable;
capricious; off the wall; cussed;
headstrong; erratic; inexplicable; foolish;
obtuse; bizarre; strange; implausible;
unbelievable; odd....

We are extremely complex beings and the idea that we can shift behaviour simply like that by giving a simple black and white message in a health education leaflet is a little naïve. It does not mean it can not work; there are some places where very simple messages can work very effectively. If I only jump and shout Fire I am pretty sure a lot of you will run out of the room and it is a very simple message but in many instances actually our behaviour is influenced by much greater complex of influences and we need to take those into account when we are trying to influence people in what they do. The commercial sector has absolutely devised some very clever ways of influencing and encouraging us to behave in a certain way. The very good in changing behaviour are consumer's behaviour. Problems begin to arise because is that consumer behaviour have other aspects from life and in our case on health outcomes. In this presentation I want to try look at it and try understand a little bit better and see if we can borrow some of those tools and then those ideas for work that we do.

First of all I want to do a little bit of exploration on that idea about what marketing is and I have taken the brave decision to make that part of the presentation interactive

so I need you help with that. (...) Then I want to say something about marketing practice, strategic planning, and something about evidence that we can not escape nowadays and there is some evidence of social marketing approaches to behaviour change that be effective. And finally I just want to bring us down-to-earth as it is still a difficult task.

First of all what is the idea of marketing? What I would like you to do is to just think for a moment about something you have bought recently it could be a cloth as it could be a car. Think through why and how you bought it. What made you think of it in the first place? What encouraged or discouraged you from buying it? Would you buy it again? What did you like or dislike about it and the process of buying it? And then I will ask you to share those with me.

Bill who recently bought a car: "I bought it because I like the brand and it is reliable and good gas management everything we need in the United States. It runs very well on Colorado Mountains where I live but I absolutely hated the process of negotiation to finally achieve the purchase of the car".

Y from Australia who bought some shampoo: "I bought it because my hair went frizzy here. I went to a pharmacy with a friend of mine. I can not read French so I just chose the picture that I recognised from home and my friend said it was a good product and it was cheap as I could work out Euros to Dollars. I bought it because I was passing by and I could".

Ron Lemaire from Canada who bought a Wii: "It is one of those video games that are wireless. I bought one it is branded it was the household preference that was driving me to buy this so in other words my children. It was on such demand that the market itself is the most stimulated in interested worldwide so if everyone have one why do have not have one? Is that much fun? So the marketing around as been outstanding and the supply demand model cut me right into its grass I ended up buying one".

There are a lot of interesting things going on there that it is worth noting on. The first point is before we get into the clever stuff about marketing and so on is that your needs are very important. The frizzy hair, the mountain in Colorado, consumer needs is at the heart of this. Even though we are very ready and I am the worst corporate on this to talk about the dressing of marketing as advertising and the promotion and so on but the heart of it has to be the consumer needs. It is one of the problem that are recovering Public Health with dealing with things that we think are important but the consumer does not necessary feels as important. The branding that came out with this is very interesting indeed and again both the shampoo and the car illustrate this very neatly. Bill bought the brand because he knew it was reliable he know it worked and he knew that presumably because he saw the advertising for it but he must also have experienced at least under directly over the years he must have had some evidence to make him think that it was a good brand. On other word there is a notion of time going on here that build up the trust. Our Australian friend

with the shampoo did not recognise the brand with the name but the logo was there, the reassuring golden arches. Also interesting to go a little further, the outcome of the product is only part of the story. The process of doing it is also very challenging. I know a little bit about buying cars in America and it is a pain in the butt and negotiate the price are nightmares it is much messier than in Europe. Finally I will just add the idea of the household preference as it was expressed by Ron very nicely put and the friend who recommended the shampoo are very important influences and I will argue that friends recommendations would always work as advertising as a source of influence on everyone. Who would you believe first? The person who has got something to make out of this decision in certain way or the friend who has nothing to gain but your friendship? There are some very important lessons there about how marketing works.

So we are dealing with people needs in one. Automatically what marketers have to do is generate voluntary exchanges. All the behaviours we are talking about are behaviours that lead to obesity for instance and people do it freely in their own free will now I am not there for suggesting that it is their own fault because clearly there is a bigger picture than that but the core that is what is happening choosing to listen to Coke and McDonalds rather than the Public Health community. So really those forces, the market place are rude waiter in this respect by forcing you in the market place to respond to consumer needs. For example when McDonalds went for salads they succeeded to some extent but it was not at all surprising when they began to retreat to those core businesses when that was not as successful as they hoped.

- Reputation matters: what you have done yesterday is going to determine what people will volunteer today. Sadly I think in the case of Public Health that was hector and patronized people so there are a little bit not cynical about what we do so much it is a little bit leery and this is a route of not having much fun. We need to recognize those basic principles of branding that are about recognition (you can recognize the shampoo even in different language), promise (it going to stop your fizzy hair from being fizzy) and delivery (it better well work once you bought it!).

- Process matters, a rude waiter would ruin the best steak. If you will life is a process outcome of what is death so we better get that process right.

- Context matters including the competitive context. The example from our friend was equally said by policy makers what has been said with wide opening mouth. The numbers of outlets for selling certain sort of products for example says a lot about how the society feels about these sorts of products. The change in Poland from no McDonalds to 300 McDonalds outlet is a profound statement of where Poland is leave aside obesity but as a political level it is a profound statement and people are not death to those things.

Related to that all this take time so we have to think of a strategic terms we have to think long term and our goal have to be towards those. It also kicks in when supply outstrips demand. If you have got the reverse demand outstrips supply then really marketing becomes an unnecessary luxury. That is why Henri Ford was able to say

"Any customer can have a car painted any color that he wants so long as it is black" because at that stage of economic development there was enough wars to go round so whatever color they produced people were finding themselves to get in. A crucial point for obesity is that if we just do the promotional end of this but we do not have the supply chain sorted out then we do get all sort of perverse pressures building up in the system. As discussed earlier we developing countries are scarifying their own nutrition in order to feed the privileging of the developed communities.

Marketing is producing what you can sell, not selling what you can produce. It is a very settle difference there but this is fundamental in what determines success about media corporations. Second key point is that there is a lot more to it than advertising. Advertising is a crucial part of it but there is a lot more to it than that. McDonalds, Coke, KFC use these ideas to influence our behaviour, our cconsumer behaviour. Social marketing simply applies the same ideas to other behaviours – health, social, dietary behaviours.

Moving to practice, the crucial point and hopefully it already come out is the idea that it does take time, it takes long term thinking. Marlboro did not become the dominant brand it is over night there has been 50 years working at it gradually hoping developing strengthening that brand. The same is true more so at Coke that has been around 100 years. It really shows up our inclinations do randomized control trials interventions experimental designs of curriculum development and so on does make it rather puny when you compare with that.



Strategic planning starts with strategic idea but define your problem it causes and its potential solutions sometimes seen in terms of Strengths, Weaknesses, Opportunities and Threats (SWOT). But we need to interrogate on the Situational Analysis working out what causes the problems and then we can begin to think intelligently about possible solutions. About Marketing Segmentation and Targeting:

whose behaviour has to change? Clearly that includes consumers and citizens but it will also include lots of other moving and shakes in this system as seen in various presentations. There are a lot of different people that can contribute to the solution to the obesity problem. We need to Set Objectives it is obvious but terribly important that we need to make sure that those objectives are realistic and measurable otherwise we are never going to know what progress we are making. We do not our

destinations and we do not know what the maelstroms are. Then we get to the crucial bit that people tend to jump in at in fact, the Formulation of Strategy. Baring in mind it is much more than some leaflets or some communication it is about what we are trying to offer, how much people are going to pay for it whether financially or emotionally or psychologically in terms of convince etc. What are the barriers in there? The place, where are they going to go and get this? How accessible does that going to be? And promotion, the messaging around it that includes connective and factual stuff but also emotional stuff, reassuring stuff, branding as this is the shampoo that will make you look beautiful (and it worked). It is called the marketing-mix and it is a “multi-faceted and flexible means of responding to client needs”. All the time come back to that question about how you are satisfying needs of the person you want to shift whether that would be a teenager or whether it would be a cabinet minister. The secret is to make the offerings that you can come with as Appealing Affordable Available and Appreciated as possible.

Every step of that way is good to be research dependent. Research becomes much more than an arm because success and failure, it becomes your compass. It is the way in which you decide which direction you are going to go at any moment. If you are a mountain climber for example you know at if you get your compass and the aiguilles is wrong at the beginning of your day you know that you are going to and up a long way from your goal at the end of the day. So it is very important to get those reading right. You will also know that you continually check your direction of travel to ensure that you are not a long way from what you are aiming so it is a continuous process. Research began a navigation tool that helps you to make all these decisions as you go through the process checks all the time so you have got the reinforcement in triangulation in continual research. Research methods include the most qualitative to the most quantitative.

Strategic planning is absolutely vital, obvious question: does it work? The simple answer is that it works for the commercial circle so of course it works. Exxon a couple of weeks ago declared they wanted to make it bigger than Sweden. Let's look for a moment at nutrition and Social Marketing. We conducted a revue a couple of years ago for the UK government looking at the effectiveness of Social Marketing. There is evidence out there that using Social Marketing principals not quite the same thing as Social Marketing interventions because some people do not call it Social Marketing but they use these sorts of principles. What happen when you use it is that you do change behaviour. On a systematic review on nutrition, substance misuse and on exercise all showed that social Marketing principles can encourage



behaviour change towards attitudes and knowledge change to bring about healthier lifestyles. So it can work and we can use it successfully.

So we have a problem: behaviourally caused ill health. But we have a solution: a powerful and proven behaviour change discipline called Social Marketing and a systematic way of applying it. We have everything and all we have to do is what an American mechanist called Wiebe in 1951 said is to “sell brotherhood like soap”.

I will just add in a note of caution from a survey delegates at a recent sustainability conference (Smith, 2003) that showed that:

- virtually all knew that HIV could be spread by heterosexual sex;
- virtually all knew that this could be prevented by using a condom;
- but around a third had had unprotected sexual encounters at the conference.

Why there is such apparent stupidity? Why people would do something that is so contrary to that knowledge and understanding and that all the Public Health messages that have been transmitted over 20 years? Why people would do that particularly educated and powered people? You might remember, using a condom involves talking to your partner about it first. Bizarre but true but in our society is often easy to have sex and to talk about having sex.

Let's do an exercise you might want to think carefully about this for a minute or two. Turn to the person on your left or right, and tell them whether or not you have ever had sex. And if you have, tell them: when you last had sex, whether you used a condom, why you did, or did not, do so. The only point I make is behaviour change is not always as easy as we would like it to be, it is very difficult. And unless we begin to see that behaviour change from the point of view that people have to do the changes we are never going to make enough progress. So if we continuously send that preaches messages saying use a condom when you have sex and don't think through that it involves a 15 years old boy turning to a 15 years old girl and answering all those questions and the likelihood it happens it vanishingly small then I think that the feeling of self enjoying nonsense that just transmits the responsibility to somebody else but there is nothing to help them. Most of the strategic cancer leaflets reflect that we do need to think about this.

Really the point I am making is that social marketing is producing some useful practical insights on health. It also includes an ethnical dimension to what we are doing. If we do not take the trouble to find out the impact of our messaging the impact of our programs and what it is like to be on the receiving end we get ourselves into theatrical places.

Finally to conclude, Social Marketing is a useful perspective to bring to behaviour change problems. It requires multifaceted and sustained effort backed by clear strategic planning. This plan must be built around a profound understanding of, and empathy with, those whose behaviours you want to change and that is true whether we are talking about the Chief Executive Officer of Nestlé, whether we are talking

about the Ministry of Health or whether we are talking about Shoggy Megaloo. We have to understand people we want to business with.

Q&A

T LOBSTEIN: I have one burning question which is about money basically. The industry of course has huge amount of money compared to the small amount available for Social Marketing and I reminded the figure showing that the government document in 2004 or 2003 where the government had just announced its wonderful new spending on promoting healthy eating and it were going to invest £7 million in promoting health eating around the UK. By comparison the industry was going to spend that sort of money, in fact twice that amount of money within the first week. So the government was coming with 7 million starting in April until the following March and the industry has spend that within the first week of April. And we go on spending twice that amount of money every week throughout the year and that is just advertising food, just advertising junk food. So there are huge disparities between the amount available to industry for promoting products and those available to government for social marketing. I know the UK government just announced £70 million which is a higher figure that they were preparing to put in this sort of activity before but even so given the inflation that is probably about a month worth of industry funding. Whether you feel that the marketing issue is going to be enough for the budget simply to do it?

G B HASTINGS: I think you are right those David and Goliath figures are sobering and if anything are worth as you say because the industry does not have that pile of money they have a continuous source of money tab that they can turn on and off. Looking at the tobacco industry e.g. they have been pummelled in North America with some very heavy law suits and settlements for the damaged they have done but really just involve a couple of sentences on the pack of Marlboro and they make their money back in a week. It is an issue not just of amount but on continuity and we do need to correct that. ON the other hand a couple of positives are in our part. If you are McDonalds you are competing directly with somebody like Burger King but also all the other fast-food out there and a lot of people as well in the way that Public Health is not. One ad talking about nutrition and health will get a sort of profile but far greater than that the equivalent amount of money that McDonalds will spend. Despite what I said earlier I think a process from a highest platform a higher state of regards with the public they might find it a bit hectic and patronizing at times but automatically they will feed that our heart is at the right place as we are doing this for their benefits not to get some value and that is a profound difference that gives us some strength.

Thos two points make that you are still absolutely right as we need to look at the resourcing of public health and have a step change in it. The only way I can see that happening is through some sort of lobby on food promotion or the food industry

particularly beyond healthy food industries. Beyond that one interesting intent I just mentioned from tobacco and it concerned the Co-Op in the UK. Co-Op is often thought as a monolithic organisation but in fact is made of the group of different organisations. One of those I think in the East of England decided about 5 years ago that it did not feel comfortable with making money out of tobacco and the Co-Op is funded on quite ethical principles in the first instance. They could not afford to stop selling it because of the coattail sales you get if somebody comes in for a pack of fags might buy a bar of chocolate and many various things at the same time so the hit will be too great. But what they did is to give that money from tobacco to charity and they have been doing that since 2000 and another Co-Op has now joined in and is doing the same thing. I think that is an interesting debate whether the private sector should be thinking about doing something similar but instead of giving the money to charity giving it to public health so that we can do some really good work on educating the public. They can become empowered consumers and I think that it is just an interesting possibility there.

PUBLIC: you have acknowledge that Social Marketing as a proportion of the total marketing that is aimed in young people is a tiny proportion and probably will always be a tiny proportion. So, my question is should be aiming Social Marketing at young people? Or should you be aiming your promotion thing and your strategy thinking at the companies who are responsible for the problem?

G B HASTINGS: The entity of your question has to be both and indeed loads of other people as well. What we are thinking to do if we really want to make progress with obesity we have to change the behaviour of lots of different sectors in the society. We have the behaviour of individuals trying to move into healthier diets and more active lifestyles but we also got to change the behaviour of politicians, teachers, doctors etc.

PUBLIC: There are people who represent food marketing in this room so my question is what your message to them is.

G B HASTINGS: I would say an important task in group need to be influenced as well. They have to get with them into negotiation with the discussion about how they would move voluntarily their behaviour but we also have to think about regulation and quite often the commercial sector will offensively through its hands up in horror of the idea of regulation but they wont be as resistant. I give you an example of banned smoking in public places: when England unlike Scotland was going down and with allonym us routes to this is was actually the industry that stood up and said “if you got to regulate get on with it” do something sensible and coherent and then we can respond to it. That is the point, the commercial sector is fantastic at the stuff it does and they do create wealth. They pay our wages, I am an academic paid by university and that money comes out of taxation and that taxation

is generated by private companies. So we need to recognize that otherwise there is a much bigger picture here. What business will do is that it will operate very effectively and the job of regulation is to set limits on what they do so within those limits they get on with it and do what they do so well as actively as they can but we stopped any major harm that are going on. The extreme example would be with tobacco. Personally I think the world would be at better place when tobacco marketing and tobacco companies ceased to exist. I am predicting that may in 15 years time we will look back and say why on earth we ever had free operative corporations with legally allowance to sell a product that kill its customers, that is insane. But with food it is not the same so we are going to have to go on a mixed route of both negotiation and voluntary actions and regulation. That is going to be a very difficult route trade and what we need trying to do is to see as far as we can how we can create win-wins but when we can not I think Public Health has to come further up the priority list so it becomes a more important consideration in terms of what policy makers do. Again one small example not with nutrition but an alcohol policy in the UK: England and Scotland have both introduce new alcohol bills. The principal difference between the two is that in Scotland Public Health is actually is *in trying* for illegitimate reasons making decision about how many licences are given and the price of alcohol and so on and is *in trying* on primarily regulations and I think a bit more of that would help.

Parents Jury – a grassroots advocacy program to improve nutrition environments

Kathy CHAPMAN

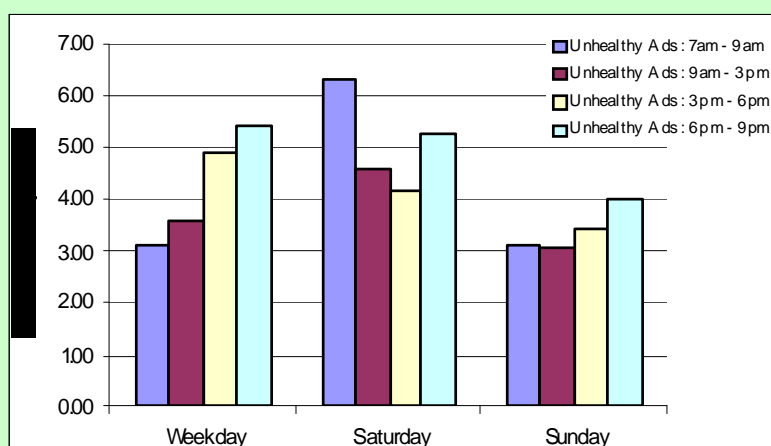
Cancer Council, Australia

The program that I am presenting does not only belong to the Cancer Council where I work but is a partnership with other NGOs involved as well. It is called “Parents Jury” and is a web based network of parents who wish to improve the food and physical activity environments for children in Australia. It is a grass roots advocacy program. Parents, grandparents and guardians of children aged than 18 can participate and the people that are involved in Parents Jury need to have access to the internet and email but it is a free program.



Parents Jury was developed to address the increase in obesogenic environments where the healthy choices are not always the normal or the easy choice. The picture that in Australia we have a lot of unhealthy food promotions that are designed to appeal children.

TV food advertising in Australia



per hour during cartoon time, and when they come home from schools in evenings.

With TV food advertising in Australia, studies have looked at when the most junk food ads are being shown and it is particularly at those times when children are more likely to be in the viewing audience such as Saturday morning from 7am to 9am when they will see about 6 food ads



In children's magazines there are a lot of competitions where prizes are given away or even some editorial as an example where in a girl magazine where they are comparing the different boyfriends they may have with the different chocolate bars. Last year we did a study with the food marketing in children's magazines and found that of the food references about 64% were for unhealthy food and only about a third of them were healthy, 36%. So it is very similar to what we have seen with TV advertising. Of course there is also internet food marketing as well.

So because of the high levels of unhealthy food environments, we came

up with the idea of the "Parents Jury".

Parents Jury has 3180 members across Australia and we certainly see more people joining Parents Jury when we do any media activity. We also have health professionals who have joined up as "Friends of The Parents Jury". There are 2 full time equivalent staff; a program manager, program officer and a media officer, who are paid staff to conduct the daily operations of Parents Jury. The program is funded by Diabetes Australia, the Cancer Council Australia, Vic Health (funded by tobacco taxes) and the Australia New Zealand Obesity Society. Two members from each of these organisations form a Steering Committee which decides on the strategic directions of the program. Some of the issues that "Parents Jury" focuses on are identified by the members: food marketing to children is a significant focus; healthy schools & food sold at canteens and also the issue of vending machines in schools; having healthy supermarket checkouts; and improved physical activity environments.

Parents Jury campaigning is very much about grass roots advocacy. We do regular polls and surveys of the parent members. For example, we might ask them a question about how they feel about confectionery being available at the supermarket checkout and use the feedback from the parents to generate our media advocacy. We also have advocacy materials and toolkits on the website for parents to become their own champions as well.

"Parents Jury" is most famous for in Australia is the annual Children's TV Advertising Awards and a new program called "Trial by Jury". "Parents Jury" also

campaigns by doing delegations and submissions to the key decision makers such as the government about children television standards or we might write a submission to the local supermarkets about having confectionery free aisles. So it is a range of campaign activity, and is not just about yelling up and down in the media.

With each campaign we try to create parent champions so that a parent might speak out on behalf of other parents in the media about having much less confectionery available at the supermarkets but it is also about having local parent champions as well. There is information available on the website so that parents can go to their own school principals and say we would like to have a healthy school policy and have much better food available in the canteens. We also try to generate media debate, informing the general public. Often time's parents are aware that they are pestered by their children for confectionery at the supermarkets or the pestered for the happy meals in McDonalds, but they do not realise how systemic it is. Our campaigns keep the general public informed. We also make sure we lobby governments and the different key decision makers for policy and regulatory reform. And we certainly are trying to put pressure on the food industry to improve their marketing practices. Food industry certainly regards us as a thorn in their side.

Parents Jury holds annual TV Food Advertising Awards. There are 3 categories including the Parents' Choice Award that is a positive thumb up award that goes to the food ad on TV encouraging healthy eating for children. In 2006 it went to Weetabix breakfast cereal which was advertised as the Breakfast of the Soccerroos, our football team during the year of the World Cup. This award category promotes a good product as opposed to a lot of the ads that are promoting high sugar sweetened cereals. Another category is the Pester Power Award, where parents nominate the food ad on TV that lead to pestering from their children and in the 3 years that have run this campaign McDonalds has won with their Happy Meal where they give away the toy and in 2006 it was Action Man & My Little Pony toys. And the last category is the Smoke & Mirrors Award and in 2006 it went to Karicare Toddler Gold®. The Smoke & Mirrors Award is for a food ad that does not tell the full story, for example highlighting one particular positive nutrition attribute without disclosing that it is high in sugar.

In 2007 we were a little bit low on nominations for healthy food ads but fortunately Woolworths which is one of our supermarkets came up with the Fresh Fruit for Kids ad. McDonalds won the Pester Power Award again and Smoke & Mirrors Award went to Kellogg's for their Coco Pops Coco Rocks ad that was a chocolate cereal with a small amount of added fibre, but they forgot to tell you that it was still as high in sugar as the regular Coco Pops.

This year we have added some new award categories. Instead of just being about TV advertising food, we have added new categories like the School Food Bully Award that is for the worst example of food marketing in schools, and the Techno Hack



Award which is for internet food marketing. Nominations are open throughout the whole year.

Another campaign added last year was Trial by Jury to highlight other food marketing campaigns to children instead of just TV advertising. The marketers were put on 'trial' by The Parents Jury after nominations from the parent members and there was a judging panel convened. Last year we had three 'guilty' verdicts handed down: the first one Krispy Kreme Doughnuts for fundraising in schools particularly in schools in low income areas. We also had a guilty verdict handed down for the movie Shrek food marketing. The last guilty verdict was Coca Cola at the time when Consumers International announced the 'Dump Soda' Campaign for the Coca Cola ad on TV which depicted Coca Cola as the ideal drink as part of the family meal. When Coca Cola won the Trial by Jury the website for that Coca Cola ad was removed immediately and the ad was no longer shown on TV.

We also had a campaign around healthy schools. Parents voted for the lunchbox winners and losers which were the best choices in lunch boxes and the less healthy products. The media release was called the "Parents give school lunchboxes a healthy wrap". We have also conducted polls of parents about their views about commercial marketing in schools, for example children being rewarded with the fried chicken vouchers or McDonalds vouchers for doing well in school. We also had a poll about active transport asking parents about their views about their children walking to school. In each of the campaigns, we create a new section on the website. For example for the healthy school food, the website provides information about the different canteen guidelines across Australia. The website provides ideas about healthier fundraising alternatives.

The Healthy Supermarket Checkout is one of the most popular issues with parents and with the media. We have called for half of supermarket checkouts to be junk food free. A poll showed 80% of parents were often pestered by their children at the checkout. The media release was "Parents sick of being pestered at the checkout". We also wrote letters and had meetings with the local major supermarket chains about introducing confectionary free aisles and some of the supermarkets checkouts have tried it but unfortunately none of them are doing it consistently.

Media advocacy is a significant part of the Parents Jury work and it is our main method of communication with the public. Whenever we do media advocacy, we have an expert nutrition person or health promotion person as well as having the parents themselves being spokespeople. We provide media training sessions for parents. The media can be a lightning rod for activity. As an example, the Trial by Jury and the Coca Cola ad achieved the removal of the ad from TV and it raised the issue with politicians as well are getting good coverage.

This slide illustrates our media coverage.



We have held 5 media training sessions over the last few years and have about 20 regular parents' spokespeople. We also have conducted consumer advocacy training sessions about helping parents understand the political system and how they can influence it.



The Parents Jury website is www.parentsjury.org.au and includes online advocacy toolkits to assist parents to become champions. For example the toolkits include sample templates for making complaint about TV ads, sample letters for schools principals to introduce healthier canteens. We are trying to make it easier for parents to speak out. There is also an active discussion forum where parents can raise different issues the website has an online reporting system so we can track who is joining, what postcode they live in and their areas of interests. We also send out a fortnightly newsletter to all the members and the website also has an event calendar.

Because we are from a cancer organisation, our pictures always have children wearing hats for sun protection.

Parents Jury is a collective voice to advocate for improved food and physical activity environments. Parents and health organisations work together towards a reduction in the obesogenic environments and allow parents to be involved. Parents can express their opinions and we give them the resources to make it easier to become grassroots champions. Parents Jury is very much about community action which is part of the Ottawa Charter of Health Promotion.



Q&A

T LOBSTEIN: It is very valuable to show the impact and power that a small NGO of just two and a half people can have getting into the media, getting companies to change their policies. It reminds me we had a shock this week of the checkout campaign in the UK in the early 1990's and indeed companies in supermarkets did respond and did remove sweet from many of their checkouts. The trouble was about 3 years later when we looked again they all crept back in again so you have to keep on having these campaigns. It makes you think maybe if it is just relying on voluntary measures the supermarkets voluntarily changing this would not be enough unless they sustain the campaigns and that a regulatory framework might be better.

PUBLIC (Jane BADHAM from South Africa): Congratulations you mentioned you had some 3000 parents. You did not mention how you got that. How did you recruit and how do you recruit now?

K CHAPMAN: It is an ongoing thing. Initially it started with the first media campaign which was about getting confectionary out of the supermarket checkout and it just grown from there. Certainly when we do a lot of media we notice that membership goes up. When we did the 2006 advertising award we had approximately 600 new members join during the nomination and the voting process. The Cancer Council and Diabetes Australia promote the program through our community networks of people who support our organisations and to our health professional contacts as well. We have a sample presentation about Parents Jury which staff from the Cancer Council use. This year we advertised through schools newsletters to recruit more parents. There are a whole range of things but media coverage gets the most of members because it is very fresh in their minds.

PUBLIC (Anne GAUTIER from the Ministère de l'Agriculture): I was wondering whether you know within you members if it is representative of all the social classes?

K CHAPMAN: Unfortunately it is not. One of the things we are doing better now is that when parents join we record the information on where they live and we have an idea of where they live and we ask them questions about their educational status as well. We do know that the people that mostly join Parents Jury have higher incomes and are better educated. We have a lot of people with a health professional background and are very interested in this area but having said that we do have representation from those other groups as well. One of the criticisms is that people need internet access. But we could not afford to run this program with mailing out to people every fortnight as well. We are trying to increase representation. We have good representation in country areas compared to city areas that is something.

PUBLIC (Saskia Te VELDE from the Netherlands): It is nice to see how active you are and I was just wondering if you are evaluating how effective these programs are. Are you measuring behaviour change in the children? Or what active change happens in the environments?

K CHAPMAN: It is an advocacy program so we are not trying to change individual family behaviour. We are trying to change environments. In terms of how evaluate, we look at our media reach and participation. It is very hard when we look at the environmental situation whether it is something like TV food advertising and the standards around those; we can not say we are the only people that are advocating for changes. Realistically we know we are not going to change that by just having one annual TV ad awards ceremony a year it is going to be constant government lobbying and things like that. So, a few things that we are doing is really saying how we are persuading the media that we are getting positive coverage and that we are getting more receptive reception when we are going to different politicians and decision makers but it is also we are thinking that we had great success we the confectionary checkout campaigns in the supermarkets when putting pressure on them to actually be just introducing it first to becoming a permanent policy.

Controlling the market using legislation: the UK experience for TV and non-TV regulation

Jane LANDON

National Heart Forum, Tavistock House South, Tavistock Square, London

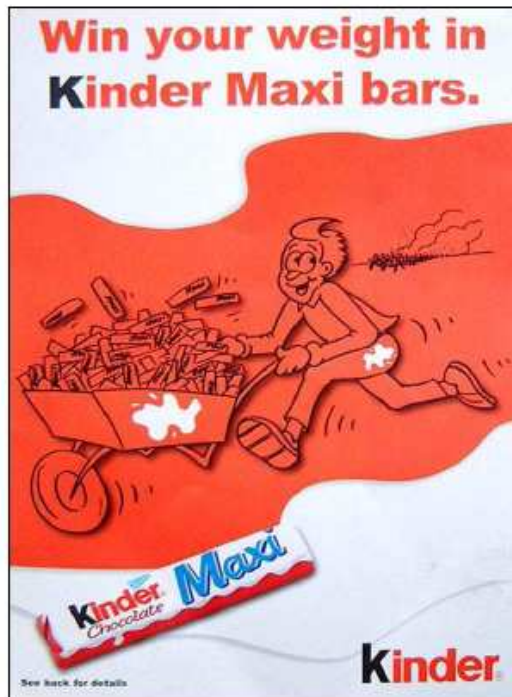
I am going to talk about regulation in the UK on TV advertising. We heard from Kathy Chapman about the excellent grassroots advocacy in Australia and I am going to focus more on advocacy by professional organisations in the UK. The National Heart Forum is an alliance of about 50 national consumer health and medical groups and our purpose is to develop and advocate policy for the prevention of heart disease. There are successful actions in the UK but I think that these should be regarded as partial successes. There are some weaknesses in what we have achieved despite the fact that in many senses what is happening in the UK is world leading and there continue to be changed.

Briefly, what I would like to cover is: to look again how powerful TV advertising in terms of children's food preferences, and to reflect on the fact that many of the controls that we need, and that we have achieved so far on food and drink marketing has been building over two decades and this progress has been largely led by the health advocacy organisations. We now have some examples of both voluntary and statutory restrictions in the UK, as elsewhere. What is interesting is to work out how we arrived at these current controls because it is a complex and complicated process as there are many twists and turns. And as we discovered in the UK, many unexpected obstacles have to be overcome. And finally we will reflect on some of the lessons that we have learned.

Talking about how powerful advertising is, I always like to see what advertisers would say themselves when we discuss what we think is the disparity between the advertising 'din' for junk food compared to advertising for healthy food. This is a member of the Advertising Standard Authority (ASA) the self-regulator in the UK quoted at an ISBA Annual Conference (2008):

"There's no case for being naïve and disingenuous about the purpose and effect of advertising. At its most imaginative and wonderful best, it does more than influence consumers' choice between brand x and brand y. It has the capacity to influence as well as reflect attitudes, behaviour and cultural norms on a much wider scale." (Baroness Jean Coussins)

The reason I particularly like this quote is because it contradicts what advertisers often say to us when they try to defend against possible restrictions on their activities; which is that advertising is only about influencing choice between brand x and y and that it has a very minor effect compared to other influences in children's life.



This ad is sadly ironic in view of the child obesity rates at the moment with the message "win your weight in Kinder maxi bars" but according to the advertisers their rules say very clearly that you "...should not exploit children credulity, loyalty, vulnerability or lack of experience." (CAP Code of Advertising Practice).

Turning to the Non Governmental Organizations (NGOs) we are very clear about what we need and what will actually make a difference. First and foremost it is about having controls which operate across all media. I am going to talk about TV advertising in this presentation but we need to put it in the context that if you squeeze

advertising in one area of media alone you will simply push the marketing effort into other unregulated areas. So we need controls that work across all media. And it needs to be all media accessed by children, not just children's media. This is often where for example the McDonalds offer in Australia not to advertise in children's air time proves to be rather less helpful that they might suggest because children watch outside of that air time. Controls need to address the cumulative effect of advertisements and promotions, not just the content - not just the messaging within individual adverts but the amount of advertising over time. We need to deal with the problems of 'border-control' so it is not enough to deal with advertising or marketing as is it operates within you own borders. A lot of what it is coming to us is part of the global media environment broadcast across national borders. And we need to have meaningful sanctions for non-compliance. If breaking the rules brings no punishment then people will continue to break the rules, as we know.

When we look at what we achieved in the United Kingdom we see that it is the result of a building momentum which has involved an interesting number of different parties and different influences. The NGOs have been pointing to the problems about food marketing to children for about two decades, but in 2001 the economists in the UK woke up to the problem when they were looking at the rising rate of obesity. The National Audit Office, which is responsible for auditing government expenditure, identified food marketing to children as one of the levers that should be investigated for addressing child obesity. The Food Standards Agency, the food regulator in the UK, commissioned a systematic review of evidence of food marketing and promotion to children which were really the seminal piece of work which has helped us to build the case for controls on food marketing. Then the MPs got interested.

They had an inquiry into obesity a couple of years later in 2003/4 and made various recommendations about policy measures that should be engaged including tackling food marketing. Finally, the government asked the broadcasting regulator to look at the problem. Then we had some new rules which I will talk to you about, and there has been some review of the self regulatory rules which I will also talk about. More recently, we now have a government obesity strategy which has brought forward a review of whether or not the current controls are working, and identified other ways in which advertising and food companies could clean up their act if you like, particularly on internet advertising.

I want to focus particularly on the new rules and on the review of the self-regulatory requirements.

Turning to TV advertising I will present a few key facts. It is hugely influential, as we discussed, and there is an awful amount of money spent on TV advertising. This is for 2 reasons. One is because it is expensive to do but two, because there is a lot of it. And most of it, according to analysis by the broadcast regulator is for the 'Big Five': fast food, confectionery, snacks, fizzy drinks and sweetened cereals. Children in the 4 to 15 age group watch about 15.8 hours of commercial television a week and that is getting to be equivalent to how much time they spend in the class room. 80% of viewing is outside of children's airtime. So if you only focus your effort on children's programming you are missing a huge amount of advertising impacts on children. And for children aged 5 to 9 viewing outside children's airtime is about 40%.

So how is TV advertising regulated in the UK? Probably it is not very different from regulation in other countries represented in this conference. It is a co-regulatory model. There is the broadcast regulator OFCOM and there is the self-regulatory organisation BCAP (Broadcast Committee of Advertising Practice). Put very crudely the broadcast regulator imposes the scheduling restrictions and the self-regulatory organisation proposes the content rules. But what is important is that OFCOM has to finally approve those content rules. In 2005 we had the new rules governing television advertising food and drink product to children. As part of the process OFCOM undertook an in depth analysis of the costs and benefits of a number of options. They also conducted their own research into the effects of advertising on children and they published a public consultation with the number of options. I want to talk about flaws in that process that concerned us. Before the consultation was published they met with what they called 'interested parties'. We had to request to be an interested party as health was not considered an interest in this issue. Interested parties were thought to be advertisers and broadcasters. When we did get around the table we advised them very clearly that in our view a restriction up to 9PM - that would capture nearly all of children's viewing, not just children's airtime - for those foods that were high in fat, sugar and salt (HFSS) was the only option that merited support. However OFCOM officials described this to us a 'nuclear option'!

They considered it to be at the far end of the regulatory spectrum and as a consequence when they published their consultation they had excluded the 9PM option saying that it was “not appropriate for consultation” because they judged it to be “disproportionate” .

This is the problem with an economic regulator regulating on an issue which has a public health dimension. We were all very concerned that if the one option that merited any support was not even on the table for discussion, the chances of any sensible regulation being agreed seemed to be vanishing.

So we talked to our lawyers and asked them if we could seek any legal redress to this consultation. In the UK – surely in other countries too - there is process called judicial review where, put simply, you ask a judge to decide whether the decision that has been taken is unfair and may be overturned. We had to act fast: go to our lawyers, have these discussions and work out what were our options while the consultation was in process. The grounds for judicial review seemed to be compelling to our lawyers. OFCOM had failed to follow its own policy on consultation which is that you do not exclude any option, you have them all on the table and you look at them all. They had acted irrationally and it was conspicuously unfair to exclude the 9PM option from discussion.

“A ‘pathetic’ attempt to curb TV advertising of junk food puts the needs of big business before children’s health, campaigners said yesterday. Regulators ruled out a ban on all ads before the 9pm watershed because broadcasters would lose up to £240m a year in revenue.”



In the meantime, like our colleagues in Australia, we prepared to do battle. We took our story to the media exposing the fact that OFCOM was effectively pitting public health interest against losses to broadcasters. This caused moral outrage among a lot of organizations and individuals. And at the same time we gathered expert witnesses to support our legal claim.

What happened is that during the 12 week consultation period OFCOM decided that it would publish supplementary documents with a full impact assessment of the 9PM option, as we had asked. They also said that they would be “welcoming all representations” on the 9PM option. Given that our purpose was simply to get this option on the table for discussion we withdrew our claim for judicial review, and we did not actually get our day in court. It was the threat of the legal action that encouraged, I would suggest, the regulator to be more open and comprehensive in its assessment of the options. What also happened is that the campaign for judicial review attracted very wide support for the 9PM option. It became the only option with any merit or value in discussions about what needs to be done to address advertising of junk food on television. A very high volume of responses were submitted to OFCOM in response to their consultation. I counted up one hundred to one in favor of the 9PM option including 43 national health, medical, children’s

welfare and consumer organizations from across the country. Included in that number was the Children's Commissioner and the Standard Food Agency itself. I think it is fair to say that although OFCOM did not agree that all ads for junk food should be restricted up to 9PM, their decision in the end went further in favor of public health considerations than they were originally minded to go (they might well deny this, but that is my assessment).

In brief these are the new rules you might familiar with:

- No high fat, sugar or salt (HFSS) ads in children's programs.
- No HFSS ads on dedicated children's channels.
- No HFSS ads in programs of particular appeal to children under age 16. (They have a way of assessing the audience watching at a given time using an index which indicates what proportion of an audience is children).
- No celebrities or licensed characters to be used in ads for HFSS products aimed at primary aged children (less than 12 years).
- No promotional offers (giveaways) in HFSS ads aimed at primary aged children like the toys that come in the packages of Happy Meals.

What is also important about the rules is that, as you saw, they talked about HFSS food. Nutrient profiling is very simply about scoring products plus or minus for healthy or less healthy nutrients enabling OFCOM to assess whether or not the advertisement can be broadcast during the restricted times.

Nutrient profiling: defining healthy and less healthy foods

Points →	0	1	2	...	10
Energy (kJ)	≤335	≤670	≤1005	...	>3350
Sat fat (g)	≤1.0	≤2.0	≤3.0	...	>10.0
Total sugar (g)	≤4.5	≤9	≤13.5	...	>45.0
Sodium (mg)	≤90	≤180	≤270	...	>900
					5
Protein (g)*	≤1.6	>1.6	>3.2	...	>8.0
Fibre (NSP) (g)	≤0.7	>0.7	>1.4	...	>3.5
Fruit, Veg & Nuts (g)	≤40	>40	>60	...	>80

For both food and drinks: scores are based on the content of nutrient in 100g.

**If food scores 11 for protein, fibre and F&V then scores 0 for protein except if scores 5 for FV&N*

Healthy/Intermediate food = 3 or less	Unhealthy food = 4 or more
Healthy/Intermediate drink = 0 or less	Unhealthy drink = 1 or more



The Food Standards Agency provided the model to OFCOM as it is beyond OFCOM's competency to decide what food are, or are not healthy. This is one of the key features in the UK that make it possible for changes in the nature and balance food marketing to take place. Under the terms of its review, OFCOM is looking at the

impact of the new TV ad rules not only to see if the rules are working but how much it is costing broadcasters, how it is costing the advertisers, and whether different advertisers are coming in to fill the gap or whether the same advertisers are coming up with different products. The Government Health Department is looking at a broader picture to see whether the changes in TV advertising regulation are having an impact on advertising in other media. And the performance of the nutrient profiling model is being assessed simply to see whether it is doing and what is supposed to be doing and whether it needs to be adjusted.

We do not really need to wait for the assessment of the new rules because it was possible for OFCOM to predict what the changes in the regulatory environment might do. Children's exposure to HFSS ads are expected to be reduced by 41% according to the rules that are currently in place. With that 9PM option it would be twice that, with a reduction of 82%. Cost to broadcasters are estimated at £22.6 million - far less than the estimated £221 million for the 9PM option. But you have to bear in mind the different social and health benefits assessed by the Food Standard Agency. Even the estimated loss of £221 million is only 3.5% of total revenue.



In other media - not covered by standard regulation - self regulation applies and it is worth remembering what the purposes of self-regulation. Advertisers themselves say the purpose is to ensure ads are 'legal, decent, honest and truthful'. It provides protection to consumers but it is also about promoting fair competition between advertisers so that there is a level playing field.

Importantly, self-regulatory rules do not deal with the amount of advertising. With few exceptions, there is no scheduling equivalent; rules only look at the content issues. If we are talking about 'turning down the noise' of advertising for junk foods we cannot rely on the self-regulatory model. Importantly, the rules do not differentiate between healthy and less healthy foods. Advertisers do not accept the principles of nutrient profiling and they made that quite clear to us, although that might be changing a little. And the other key issue is that self-regulation does not cover all media, such as websites, which are considered to be editorial, and SMS messaging. For example, the Nesquik Rabbit, because it appears on a corporate website, is not covered by any advertising regulations.

The non-broadcast media self-regulated rules were under review in 2007. The small changes that were introduced were:

- No celebrities or licensed characters should be used in ads for food or drink products aimed at primary aged children (<12 years).
- No promotional offers or giveaways in food or drink ads aimed at primary aged children. (CAP Code of Advertising Practice, 2007)

What you notice is that they are not talking about junk food, or HFSS foods, they are talking about all foods. But they have put in an exemption for fruit and vegetable advertising. But because the amount of fruit and vegetable on television in the UK is tiny, this exemption is not going to make a great deal of difference. It is important to see what the advertisers say about their voluntary code. In the days following publication of the new changes to the code, it was reported in Campaign Magazine - which is the flagship publication for the advertising industry in the UK: *"...it doesn't take a genius, however, to spot the weasel words, the obvious fudges and the potential anomalies just waiting to emerge."*

Another mechanism whereby marketing to children can be controlled is when the food companies themselves choose to withdraw or restrict their activities. We are seeing more and more of such commitments, which is not surprising because the threat of regulation in Europe and the threat of litigation in the US have sensitised a lot of food companies to do more in order to head off these threats. We are often seeing general, rather than specific commitments. It is quite difficult to pin them down in what they actually mean. When it comes to companies' definitions of children they may define them as fewer than 8 or fewer than 12 but you very rarely find older children, covered. And we all know that teenagers are very susceptible to advertising and marketing because they may understand that they are being advertised to, but that does not mean that they have the powers to defend against the persuasive intent. Commitments are generally only applied where children form the majority audience. The percentage of children in the UK is about 14% of the population so for them to be watching in greater absolute numbers than adults is rare. There is no independent monitoring of food company commitments as it is very difficult to do. NGOs have no resources to do it and governments are not minded to do it. We tend to rely on the food industry to tell us whether they are doing what they say they are doing. And as a consequence, things that are promised are not delivered, or companies may deliver and then take it back again. Kraft was one of the first companies to say that it would stop providing supersize portions and then 2 years later it said they had talked to their customers who told them they would like a full range of product sizes so Kraft decided to offer them the full range of product sizes including supersize. Finally, global companies, although they maintain their brand globally often apply the commitments selectively. What you might find in one country would not necessarily follow through in another.

I'd like to turn to the role of health and consumer organisations because I think that they have been influential in the progress such as it is that we have seen in the UK

and also elsewhere in Europe and overseas. What NGOs can do is to maintain pressure on governments and on regulators to regulate, and regulate properly and in the public interest. They can identify flaws in proposed regulations and propose 'best' models of regulation. They can monitor the effectiveness of new rules and food company commitments, bearing in mind that it is a big job and they are not resourced to do that on a global scale. What they can also do is to share their experience gained in other countries and in other spheres. So for example the lessons learned from tobacco; we should talk to our colleagues of tobacco control and alcohol control about ways to deal with the problems that arise in dealing with multinational corporations, share best practice and the tricks of the trade about how to campaign and advocate effectively.



The Children's Food Campaign report in the UK has been looking at how to tackle numerous media; it is actually a model suggesting how you would go about framing rules that would protect children from junk food advertising in media other than TV (*Available at www.sustainweb.org.uk*)

Finally, voluntary measures can succeed but they are unlikely to succeed without the monitoring and the sanctions that we talked about. In the absence of these, statutory regulation has its place. You need your 'sticks' as well as your 'carrots'. What we have in the UK is a valuable start, and work is progressing. I would finish by asking you to keep in mind the achievements of civil society - and that is all of us; both as individuals working through grassroots organization like the Parent's Jury, and through professional organizations as doctors, nurses or dieticians, or as members of whatever organizations we contribute to.

Q&A

T LOBSTEIN: it is wonderful to see that junk food advertising at last being defined and being shown in statutory regulations. Twenty years ago when the food industry was saying that there was no such thing as good or bad food - it is all about the diet. Ten years ago they say; actually there are good foods and we put label on them saying it, but they were not defining the bad food. It is really exciting now to see that not only it is defined but it is shown in regulations that there is such a thing as a junk food.

PUBLIC (Albert HIRSCH, Lutte contre le Cancer) : Par analogie à la réglementation concernant les produits de tabac et en vous félicitant de l'avance que vous avez au Royaume-Uni par rapport à la France, je voudrais vous demander si premièrement il y a un observatoire de l'infraction aux règles de la publicité que vous avez mentionné, deuxièmement avez-vous des perspectives sur la réglementation d'autre

forme de publicité, soit direct par exemple le cinéma soit indirecte par exemple le packaging c'est-à-dire les paquets englobant les aliments qui ne sont pas recommandés ?

J LONDON: You are quite right to identify the other media because as I say if you only concentrate in one area the effort will go elsewhere. The report of Children's Food Campaign in the UK seeks to address just those other media. There is not the appetite within the self-regulatory organizations to go far enough or fast enough to deal with the volume of advertising. It is asking the wrong people to do it. We are going to propose what the rules should look like and I think we are going to need to ask the statutory regulator to overrule the freedom of self-regulation. That is very significant step away from the status quo. Have there been any violations? I actually spotted one and I reported it to OFCOM and it will be taken into consideration in their review which started in July and will probably not report until Christmas. But because the advertiser is able to submit their adverts in advance they can see whether or not it is above or below the bar for nutrient profiling. They have all the help that they need so there is no excuse for violation.

PUBLIC (Serge HERBERG): Nous sommes dans l'actualité en France de cette discussion puisque la ministre de la Santé a annoncé le 4 février dernier qu'elle demandait aux industriels de l'agroalimentaire de fixer une régulation sous forme d'une loi, une autodiscipline, sous réserve si cette autodiscipline n'était pas rapidement mise en place. Des réunions préparatoires ont eu lieu aux Ministères boycottés par l'ensemble des firmes agroalimentaires et de la grande distribution. Nous attendions bien évidemment ces difficultés de la part des partenaires économiques du champ de l'agroalimentaire par contre nous n'attendions pas des difficultés aussi violentes des chaînes de télévision qui en France sont montées au créneau pour défendre la création jeunesse voire même la création artistique. La Ministre de la Culture française qui est en charge de la direction des médias a même déclaré publiquement que touché à la publicité n'avait sûrement pas d'effet sur l'obésité de l'enfant mais était une catastrophe économique pour les chaînes de télévision et pour la culture française. Je voulais savoir si pour vous en Angleterre ce problème du coût économique des pertes pour les chaînes également pour les fabricants de publicité, pour les fabricants de programmes jeunesse si tous ceci avait été un obstacle majeur à la mise en route de ces restrictions et savoir comment vous avez pu vaincre cet obstacle qui pour nous est extrêmement fort et puissant.

J LONDON: You put your finger on it because that was precisely the obstacle. The loss of revenue was what primarily appeared to concern the broadcast regulator. Their role was to regulate in the interest of the industry; that was the broadcasters and indeed advertisers are part of that. They were very frustrated by our campaign and in fact took the unusual step of writing an open letter to the Financial Times. In it the CEO of the regulator said: If the government wants us to take a public policy

decision - and we consider this to be a public policy decision - we are not the right ones to do it because we must weight the costs in a certain way to meet or regulatory objectives. So effectively they were saying they cannot do this. So we told them the government needs to take action rather than just simply hand it to the regulator. And our hope is that the government will - when it sees that what the rules deliver is half of the level of protection that we need - that they will decide to act in the public interest and overrule the regulators to say 'no advertising up to 9PM'. That is our hope.

T LOBSTEIN: The website of OFCOM gives intensive analysis of costs to the food industry, costs to the advertising industry, cost to the broadcast industry and then some estimates of the health benefits. It is a very interesting analysis and there are a lot of arguments about the correct figures.

J LANDON: But slightly flawed because of course they weighed the fact that adults would not see junk food advertising as a dis-benefit to broadcasters and advertisers rather than potentially as a public health benefit because the rules focus on children, not adults.

PUBLIC (from WHO): Taking the spin from the title from policy action what do we do now. Now there is going to be an advertising gaps there may plan to promote or give incentives to the healthy food or the fruit and vegetables or physical activity to fill in that gap?

J LANDON: That is a very good question because one of the difficult analyses was how a restriction on one type of advertising would be substituted by other products and it was quite difficult to model that. OFCOM rather relied on the advertisers to give them that information and I suspect they did not feel they had an interest necessarily to do so because they would prefer to maintain the status quo. This underlines the importance of the principle of being able to differentiate between healthy and less healthy foods; to say which you want to have less advertised, and to create space for advertising for food you do want to promote. I think about experience in other sectors, when tobacco advertising was restricted it did not mean the end of magazines, it did not mean the end of Formula1 sponsorship. Other companies and other products come in. Within the food sector, a lot of companies are making a virtue of their healthier product lines like Nestlé or Pepsi particularly - companies with the broad portfolios. And there would be more affordable airtime in which they might advertise.

SESSION 12

ROLE DES ACTEURS TERRITORIAUX POUR PROMOUVOIR LES F&L A L'ECOLE

Chair: **J. Remiller**

- Action pédagogique sur la nutrition dans les lycées et CFA de la région Ile de France. **J. Penez**
- Assurer un relais au-delà de l'école en agissant avec les habitants, à l'échelle du quartier. **P. Martin**
- Comment mutualiser les compétences et fédérer les projets de l'ensemble des acteurs locaux? **P. Berger**
- Nutrition Santé Adolescences Val de Marne. **E. Feur**

Introduction

Jacques REMILLER

Assemblée Nationale, Paris, France

(...) Nous débattons ce matin du rôle des acteurs territoriaux pour promouvoir les fruits et les légumes à l'école. (...)

Pour me présenter je suis maire d'une ville de 35 000 habitants, un des responsables également d'une communauté d'agglomération de 70 000 habitants, je suis député et (...) je suis président à l'Assemblée Nationale depuis la dernière législature du groupe d'études Fruits et Légumes qui est un des plus importants groupes d'études de l'Assemblée Nationale. Je comprends qu'ils aient adhéré à ce groupe parce que la production fruitière française est quand même importante. Je vais vous le rappeler, c'est 7% des exploitations agricoles et c'est 0,6% de la surface agricole utile. C'était beaucoup plus il y a quelques années mais avec les problèmes de consommation en particulier, il y a une transformation parfois dans certaines régions de France de la production de fruits en céréales ou toute autre production. La pomme reste le premier fruit français, nos exportations sont en baisse et aujourd'hui nous importons ce qui est quand même un comble alors qu'il n'y a pas si longtemps nous étions un des principaux pays européens à exporter. Et, la consommation française est en baisse et il faut se demander pourquoi. D'abord les aléas climatiques qui sont déroulés encore pour la septième ou huitième fois cette nuit. Aussi, il y a le problème de cherté, le problème de concurrence et c'est pour cela d'ailleurs que l'Assemblée Nationale qui fait l'étude de la grande modernisation économique va étudier en particulier les problèmes de concurrence mais c'est un atout malgré tout pour l'emploi puisqu'il y a 200 000 salariés sur la production fruitière dont 15 500 permanents.

L'objet de cette table ronde est le rôle des acteurs territoriaux. Je suis très fière car j'ai déposé une proposition de loi que vient de reprendre le Ministre il y a quelques années en étant partie au cimetière des propositions de lois, pardonnez moi du terme mais c'est le jargon que nous utilisons à l'Assemblée Nationale, c'est-à-dire que chaque député dépose sa proposition de loi, à ne pas confondre avec un projet de loi qui est le gouvernement alors que proposition de loi c'est le député, 99,99% ne sont pas retenues par le gouvernement. Un jour enfin, le ministre Michel Barnier m'appelle et me dit qu'il va retenir ma proposition de loi que j'avais déposé alors que Hervé Guémard à l'époque –ça remonte déjà à quelques années – était le ministre de l'Agriculture c'est-à-dire une distribution journalière de fruits frais dans les établissements publics et privés. Donc ce sont bien les acteurs territoriaux qui prennent un certain nombre d'initiatives. Le ministre qui a succédé Hervé Guémard était venu d'ailleurs voir ce processus que nous avons mis à titre expérimental dans une école de la circonscription dont je suis le député avec des goûters chaque jour à 9h45 et 15h et une participation modique des élèves. C'est justement là-dessus qu'il

va falloir vraisemblablement que nous fassions des propositions. Cela va avoir un certain coût, soit pour la mairie dans le cas des écoles maternelles ou des écoles primaires, soit le conseil général dans le cadre des collèges ou la région dans le cas des lycées voire même l'Etat, on peut rêver, dans le cadre de l'université. J'avais fait cette proposition de loi pour aider les producteurs de fruits à une période de méventes, pour écouler ces produits frais et consommables très rapidement et il faut les écouler immédiatement et aussi pour lutter contre les problèmes de santé publique et en particulier lutter contre l'obésité. Certains professeurs et spécialistes nous disent qu'il faut manger 5 fruits et/ou légumes pour avoir une bonne santé, ce que les docteurs vous diront. Ce processus que j'ai mis en place dans la Vallée du Rhône va être étendu grâce à tous les acteurs territoriaux sur le territoire national. Monsieur Martin qui est le directeur la Maison de la Promotion de la Santé de Dunkerque liera le problème entre la santé et également l'écoulement des fruits et ce que font les acteurs territoriaux qui initient des projets et qui les mettent en musique.

Action pédagogique sur la nutrition dans les lycées et CFA de la région Ile de France.

Jacqueline PENEZ

CERVIA, Paris, France

Cette action pilote que nous avons intitulée « Des fruits et légumes de proximité pour les jeunes franciliens » est le prolongement de la signature par Jean-Paul Huchon, président de la région Ile-de-France et les professionnels du monde agricole, de la Charte Fruits, Légumes et Société, en septembre 2006.

Cette charte a été rédigée par l'Interprofession des fruits et légumes frais (INTERFEL), l'objectif étant de mobiliser les collectivités locales pour qu'elles agissent, chacune à leur niveau de responsabilité, pour une alimentation favorable à la santé.

Avant de vous présenter concrètement cette action, il convient de la situer dans le cadre des compétences d'une Région. Elle se situe à la croisée de deux grandes compétences des conseils régionaux dans la loi de décentralisation : la responsabilité d'être coordinateur ou 'chef de file' du développement économique et la mise en œuvre du schéma des formations.

Pour la première fonction, coordination du développement économique de la région Ile de France, la région Ile de France a adopté en octobre 2006, un Schéma Régional de Développement Economique qui définit à la fois les filières et les territoires prioritaires et où bien entendu, l'agriculture a toute sa place. On ignore souvent en effet que l'Ile de France est une grande région agricole, à la fois pour les grandes cultures - c'est une des premières régions productrices de céréales - mais aussi en productions maraîchères donc en fruits et légumes et c'est le sujet qui va nous intéresser ici. C'est également une grande région par rapport à l'industrie de transformation et donc par rapport à la filière agro-alimentaire. Aussi, dans notre schéma régional de développement économique, nous avons un chapitre qui s'intitule (...) 'Donner au secteur agricole les moyens de son maintien et de son développement'. On est bien là au cœur de cette mission que se donne la région Ile de France pour soutenir ce secteur. Ceci est donc le premier pilier justifiant notre intervention de coordination du développement économique.

Le deuxième pilier est la formation et dans formation, il y a à la fois la formation initiale et la formation continue tout au long de la vie. Les régions ont à la fois en charge la construction et le fonctionnement des lycées, la formation professionnelle et celle tout au long de la vie. Depuis Juin 2007, nous avons mis à plat l'ensemble de la politique et des moyens de la Région dans un plan transversal qui s'appelle le « Plan régional de formations ». En Ile-de-France, nous avons 500 Lycées publics et 200 lycées privés, ce qui est une lourde responsabilité, quand on la compare avec d'autres régions qui n'ont pas la même difficulté à gérer ce patrimoine important. Nous avons

également en charge l'apprentissage, au travers des Centres de Formation des Apprentis (CFA) qui sont de la responsabilité directe des Régions.

C'est dans ce cadre, que la Région d'Ile-de-France, au travers de son organisme associé qu'est le Centre Régional de Valorisation et d'Innovation agricole et alimentaire (CERVIA Paris-Ile-de-France), a lancé une opération en direction des jeunes lycéens et apprentis autour de la nutrition et en lien avec le territoire.

Les Régions, comme toutes les collectivités territoriales, ont besoin d'avoir des structures et des outils très opérationnels. C'était d'autant plus nécessaire en Ile-de-France pour la filière alimentaire qui souffre d'un grave déficit d'image. Le CERVIA a vu le jour en 2007 ; il est né de la fusion entre deux structures préexistantes, le CRITT IAA (Centre Régional d'Innovations et de Transfert de Technologies) qui avait une mission d'interface entre la recherche et les entreprises et le Comité de promotion des produits agricoles et agroalimentaires. Cet organisme a trois membres fondateurs : la région qui a pris l'initiative et qui supporte la plus grosse part du financement, la Chambre Régionale d'Agriculture et l'Association Régionale des Industries Agroalimentaires. Elle a pour adhérents à côté d'institutionnels, une très forte représentation des professionnels de l'agriculture et des métiers de bouche.

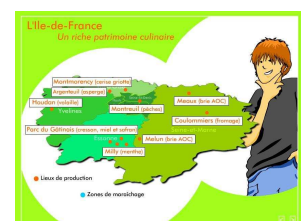
Les missions du CERVIA sont doubles : la promotion des territoires et des produits d'une part et l'innovation et la qualité dans les entreprises d'autre part. Nous travaillons en particulier étroitement avec AgroParisTech, nouveau regroupement des grandes écoles de formation d'ingénieur présentes en Ile-de-France.

Le CERVIA était donc tout naturellement missionné pour conduire l'action nutrition sur les fruits et légumes, en lien avec l'interprofession.

Des fruits et légumes de proximité pour les jeunes franciliens

Nous avons une grande question, un grand défi qui est : comment développer la consommation de fruits et légumes de proximité en Ile de France ? Cette question se pose dans un contexte que vous connaissez dans les autres régions et autres pays européen également, qui sont celui de l'augmentation dramatique et inquiétante (...) de l'obésité et du surpoids. On considère en Ile de France qu'1 francilien sur 3 présente un surpoids par rapport aux normes classiques. Cette tendance aujourd'hui ne fait que s'accroître et en particulier, et c'est une question encore plus préoccupante pour les politiques que nous sommes, dans les catégories de population les moins favorisées, ce qui est une inquiétude supplémentaire par rapport à l'accès à une alimentation de qualité.

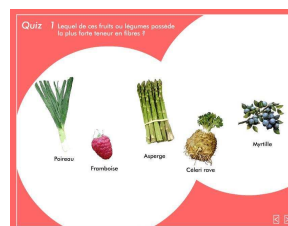
Partant de ce constat de l'obésité et de la signature en 2006 de la Charte « Fruits et Légumes et Société » INTERFEL par Jean-Paul Huchon, Président du Conseil Régional d'Ile-de-France (dont



chacun connaît l'attachement au secteur agricole et agro-alimentaire à la fois par son passé politique au Ministère de l'Agriculture également par son passé professionnel au Crédit Agricole), le CERVIA s'est vu confier le montage d'une action pilote.

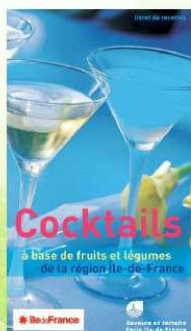
L'association EVEIL, bien connue des enseignants et rectorats, a été choisie comme prestataire pour travailler sur des supports pédagogiques et leur présentation en milieu scolaire. Le travail se fait avec des classes volontaires et le relais soit de professeurs de différentes disciplines : Sciences de la Vie et de la Terre (SVT), Education Physique et Sportive (EPS), soit du service médical. L'intervention dure environ 1h30 devant les lycéens. Le module comporte des visuels, des questionnaires sur la connaissance des productions de l'Ile de France et la connaissance des produits frais en général. (...) Nous avons ensuite deux petits films d'une dizaine de minutes qui ont été spécialement réalisés pour cette opération : l'un présentant la région Ile de France agricole et gastronomique qui s'appelle « *L'Ile de France, destination saveurs* » et l'autre qui porte sur un produit emblématique qui est la pomme, il était une fois une pomme qui présente le circuit de production et de distribution des pommes d'Ile de France.

A la fin de cette intervention, les élèves reçoivent deux petits supports : un livre de cocktail à base de fruits et légumes et un calendrier de saisonnalité des légumes mis au point par le CERVIA parce que, c'est un des axes importants, nous mettons la priorité sur la consommation de produits de proximité mais également la consommation de produits de saison.



Supports de communication distribués

- Livret de cocktail à base de fruits et légumes



- Calendrier des Fruits et Légumes d'Ile de France



Le bilan

Le bilan n'est évidemment que très partiel puisque c'est une opération qui n'a qu'un an puisqu'elle a démarrée à la rentrée scolaire 2007. Nous avons réalisé un certain nombre de supports films et supports papiers. Nous avons recruté cette association EVEIL qui fait la présentation et qui nous a mis à disposition une diététicienne qui présente le module dans les lycées. Nous avons envoyé un mailing dans les lycées et CFA d'Ile de France en commençant en novembre 2007. Sur cette année scolaire nous avons eu une centaine d'interventions qui correspondent à peu près à 3000 jeunes qui ont été touchés.

Nous constatons qu'il y a un grand intérêt, une grande attention ce qui nous a agréablement surpris. Ils découvrent la réalité de l'Ile de France, de ses productions, de la saisonnalité. Nous avons constaté que ce système fonctionnait bien quand l'adulte relai était mobilisé et moteur ce qui est le facteur du succès.

Il ne s'agit pas d'une opération ponctuelle, nous voulons la prolonger et pérenniser dans le temps. Pour la rentrée prochaine, nous allons proposer ce module à de nouveaux établissements. Des fiches activités viendront compléter le module existant.

Nous avons un deuxième axe d'accompagnement qui n'est plus au niveau des lycéens mais au niveau des structures et cet axe d'accompagnement se fera par l'intermédiaire des cantines scolaires (...). Nous voulons prolonger cette opération par une action auprès des gestionnaires de cantines avec notamment un classeur de recettes pour les gestionnaires et des mises en relation avec les producteurs locaux.

Assurer un relais au-delà de l'école en agissant avec les habitants, à l'échelle du quartier

Philippe MARTIN

Maison de Promotion de la Santé, Dunkerque, France

Je représente avec François Liber, adjoint au Maire de Dunkerque, la ville de Dunkerque et son agglomération de 220 000 habitants. Malheureusement nous ne sommes pas une grande région de production de fruits et légumes puisque nous sommes complètement tournés vers la mer et vers l'industrie, nous sommes une région d'industrie marquée à la fois en terme de sidérurgie et production d'énergie avec notamment la plus grande centrale nucléaire d'Europe. Nous avons identifié un grand nombre de problématiques de santé qui sont liées à la question de la nutrition et de l'alimentation en générale. Nous avons des indicateurs négatifs sur un certain nombre de pathologies : en termes d'obésité, de diabète, d'infarctus et de cancer avec des indicateurs de mortalité et de morbidité qui sont très négatifs par rapport à la moyenne nationale et encore plus négatifs par rapport à la moyenne européenne. Ces indicateurs ont été récoltés dans le cadre des programmes régionaux de santé et des programmes territoriaux de santé qui sont menés en lien avec les services de l'Etat et également les services locaux puisque l'agglomération dunkerquoise est une des premières à s'être lancée dans le cadre de son contrat d'agglomération dans des problématiques de santé publique.

Concernant les indicateurs de santé, nous avons des indicateurs aggravés en ce qui concerne les populations les plus en difficultés sociale et économique, ce qui a amené la collectivité à se poser la question d'une politique volontariste en matière de santé. Dunkerque (ainsi que Nancy) est ville-santé membre du réseau français des villes santé de l'OMS depuis 2004 et en 2007 parmi les trois villes françaises dans le réseau européen des villes-santé de l'OMS. Ce qui nous donne un certain nombre de contrainte en termes de méthodologie et de rendu-compte, ce qui nous à amené également à adhérer (parmi les 10 premières villes) à la charte ville active du PNNS.

Politique volontariste de santé



- Dunkerque est ville-santé du réseau français des villes santé de l'OMS depuis 2004 et Europe depuis 2007
- Ville active du PNNS et signataire de la charte fruits et légumes avec Interfel
- Dispose de plusieurs outils de la politique de la ville tels que un ASV et un dispositif CUCS

Enfin, nous sommes également signataires de la charte fruits et légumes avec INTERFEL. Nous avons également un troisième dispositif qui est celui de la politique de la ville et nous disposons au sein de notre collectivité d'un Atelier Santé Ville et d'un dispositif de cohésion sociales CUCS.

L'intérêt de ces trois dispositifs est qu'il faut les mettre en cohérence au service d'une politique de santé et rechercher la cohérence à tous les niveaux d'intervention que ça soit au niveau agglomération, de la ville, du quartier. Dans le cadre de son engagement, la ville de Dunkerque entend agir dans le domaine de la nutrition mais aussi de l'activité physique. Dans le cadre de ses compétences communales, la ville de Dunkerque agit avec ses services municipaux. Elle oriente ses services, notamment la restauration scolaire, l'éducation, le sport vers une plus grande prise en compte de la problématique de la nutrition dans les activités quotidiennes. C'est-à-dire que quand un service avec son élu imagine sa politique de santé il l'imagine en ayant un regard particulier pour la santé pour tous. Enfin, dans le cadre de la politique de cohésion sociale, la dimension santé est intégrée en direction des publics les plus fragiles. L'intérêt est de travailler avec les populations qui sont les plus éloignées des problématiques de prévention et qui sont souvent très loin des grandes campagnes de prévention nationale qu'on peut voir assez régulièrement.

Dans notre projet local, nous avons axé notre travail sur la proximité qui est pour nous une priorité. C'est une proximité à la fois géographique mais aussi une proximité culturelle avec les gens, dans leur cadre de vie, l'idée étant de ne pas se contenter des grandes campagnes nationales mais de travailler dans le cadre de ces campagnes avec les habitants et non à leur place et enfin de s'inscrire au cœur des histoires des territoires parce que chaque territoire a une histoire et il est intéressant de pouvoir l'intégrer dans des politiques de prévention. Nous communiquons également autour du PNNS qui a 9 recommandations. Nous en travaillons 2 de manière prioritaire qui est la consommation de fruits et légumes et l'activité

physique adaptée (la demi-heure de marche rapide par jour). Le troisième point est d'accompagner les choix de consommation car il est vrai que pour un certain nombre de populations le choix est aujourd'hui difficile tant l'offre est confuse. L'idée est de donner aux populations, notamment à celles qui sont fragilisées, des informations et des moyens en termes de consommation.

Pour les comportements alimentaires nous travaillons sur trois niveaux. Le premier est un travail avec les professionnels dans les restaurants scolaires tant sur le plan de la sécurité alimentaire, puisque l'idée est de faire un travail sur l'équilibre alimentaire mais aussi dans un cadre sécurisé.

Les comportements alimentaires

- Travail avec les professionnels dans les restaurants scolaires tant sur le plan de la sécurité alimentaire que de la diététique.
- Travail avec les enfants: dans les restaurants scolaires et les écoles.
- Travail avec les adultes: montées des connaissances et choix de consommation

La formation de ceux qui encadrent les restaurants scolaires est de travailler aussi sur le cadre de vie c'est-à-dire le milieu dans lequel les enfants évoluent pendant quelques heures le midi. Deuxièmement, nous travaillons avec les enfants dans les restaurants scolaires lors de la pause méridienne utilisée pour faire de l'éducation par le jeu grâce à des méthodes pédagogiques que nous avons créées avec le Groupement Régional de Promotion de la Santé de Lille. On a parlé tout à l'heure de la distribution de fruits, sur les démarches bio puisqu'aujourd'hui c'est un peu rentré dans une phase de développement et aussi la remise en question de pratiques séculaires de distribution de lait etc. dans les écoles qui remontent au temps d'après guerre. Nous retravaillons un peu tout cela sous un nouvel angle avec des fruits et légumes plus présents, il y a aussi un choix économique, donc tout ça est pris dans sa globalité. Nous travaillons avec les enfants dans les écoles également puisqu'il y a un gros travail avec les médecins scolaires. Enfin troisième point, le travail avec les adultes, où nous agissons beaucoup dans le domaine de la formation : formation des parents d'élèves, formation des professionnels et formation des adultes volontaires dans le cadre des groupes d'expression santé dans les quartiers.

Nos interventions se situent dans trois espaces. Dans ce qu'on appelle les Maisons de Quartiers qui sont des lieux de vie sociale dans les quartiers, l'idée n'est pas de créer une nouvelle structure qui parlerait de santé dans les quartiers mais d'utiliser les structures existantes. On a cru utile de prendre appui sur les réseaux sociaux et d'animation sociale qui existaient déjà dans les quartiers. Pour l'instant nous avons dix Ateliers Santé qui fonctionnent dans les quartiers à partir de ces fameuses maisons de quartier. Nous travaillons également avec les parents d'élèves donc avec des adultes et pas simplement avec des enfants. On essaie de recréer le couple parent-enfant/éducateur voire dans un troisième rôle le médecin. Refaire ce lien et de le faire produire des choses c'est-à-dire ne pas travailler pour eux mais aussi qu'ils produisent des choses en termes d'outil ou de support, est un de nos objectifs prioritaires. Enfin, la troisième sphère est celle des publics fragilisés, donner l'accès aux populations les plus éloignées à des informations qui leur seraient utiles. Nous travaillons dans ce domaine avec certaines associations caritatives qui font la distribution alimentaire et on sait que très souvent on a des produits secs voire des conserves et que les produits frais sont assez peu présents bien qu'il y ait une très grande amélioration notamment ces derniers temps. Nous agissons également avec les populations étrangères puisqu'il y a aussi une problématique autour de cette population en termes d'alimentation. L'idée pour ces publics fragilisés c'est de leur faire participer à des activités grand public en s'appuyant sur des manifestations nationales. On parle du Parcours du Cœur qui a été fondé il y a environ 25 ans dans la région dunkerquoise et a pris un peu d'ampleur, tant mieux. On les fait participer à la semaine Fraich' Attitude en termes de relais (...) et également dans la lutte contre les cancers puisque c'est une problématique extrêmement prégnante dans notre région.

Quelques exemples pour illustrer l'action. On a un certain nombre d'ateliers qui fonctionnent autour de cuisine et santé notamment de la cuisine à partir de produits frais, l'idée étant de démonter un certain nombre d'automatisme aujourd'hui acquis, notamment vis-à-vis des populations les plus jeunes sur la consommation de plats cuisinés à mettre aux micro-ondes, c'est aussi retrouver le goût et retravailler la notion du goût. On essaie de trouver des termes un peu évocateur, on a un travail autour de la santé communautaire et sur l'hygiène de vie globale qui s'appelle 'Bien être en couleurs' parce qu'on est dans l'inter-culturalité aussi dans ces quartiers et qui fait intervenir des acteurs différents et les habitants sur quatre thèmes principaux : alimentation, activité physique, sommeil et mobilité (sur les alternatives à l'usage de l'automobile). Autres exemples, des livrets conseils pour les parents d'élèves sont fait par les parents d'élèves avec la médecine scolaire, avec des appuis de diététicien etc. ; une opération qu'on appelle 'Croq'mail' qui vient du fait qu'on a un quartier qui s'appelle le Jeu de Mail, les participants ont détourné ce nom pour donner une identité à l'éducation pour la santé, c'est lié surtout au structure d'accueil de jeunes enfants, centre de loisirs, voyages scolaires etc. sur l'accompagnement des parents pour proposer des repas équilibrés et non pas simplement le paquet de chips qu'on met dans le sac à dos. Le dernier point c'est le remplacement de l'alcool le plus

souvent possible dans les manifestations municipales et le remplacement de l'alcool par des boissons fruitées.

En termes d'évaluation on a à peu près 10 groupes et une centaine de personnes mais ça évolue beaucoup, c'est fluctuant en fonction des entrées et sorties, vous savez que nous sommes dans un système de liberté dans la santé publique. Il y a un effet d'entraînement sur plus de 400 personnes puisque c'est un travail par les pairs en voisinage, en famille etc. On a évalué que les habitants étaient vecteurs de communication grâce au travail du bouche à oreille, ils sont allés jusqu'à créer des mini sites internet avec des blogs pour travailler avec les autres. Ce qui est aussi important chez nous c'est le partenariat et la transversalité. Le partenariat se réalise avec les services de l'Etat, on parle souvent de l'Education Nationale mais pas simplement, avec le Conseil Général, avec les collectivités territoriales, Conseil Régional, avec les acteurs locaux, municipaux et para-municipaux et tout ça se retrouve aussi dans l'atelier santé-ville mentionné auparavant. Sinon, nous avons un système de labellisation d'outils via le PNNS, le coût n'est pas extraordinaire puisque c'est la transversalité qui fait qu'on mutualise un certain nombre de moyen, pour la Maison de Promotion de la Santé c'est 30 000€ à peu près étant entendu qu'il y a des appels à projet dans le cadre des programmes régionaux de santé publique.

Les freins sont le budget alimentation dans le budget général des familles, la durabilité des financements publics pour travailler d'une manière pluriannuelle et non pas simplement sur des séquences annuelles selon des budgets annuels des ministères ou des administrations, la pérennisation des actions à travers des acteurs pérennes car dans les territoires les choses bougent beaucoup et on cherche donc à avoir un volume d'acteur assez stable même si ce n'est pas toujours facile, le manque de connaissances théoriques dans la population générale car il y a beaucoup de confusion en terme de nutrition et d'alimentation et il y a un travail à faire là-dessus et puis l'évaluation de l'impact santé.

Quant aux leviers ce sont la motivation des professionnels et des habitants surtout quand on les met en partage d'enjeux en diagnostics partagés et en projets collectifs, la valorisation des services et des opérateurs à travers des conférences de presse avec la presse locale qui marche assez bien et, on observe une montée des compétences des acteurs locaux, ce n'est plus réservé aux diététiciennes ou autres il y a une ouverture sur un certain nombre d'acteurs qui ne sont pas forcément du monde médical et plus ouvert à la population professionnelle générale.

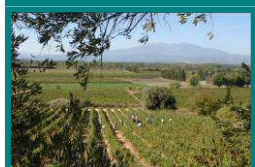
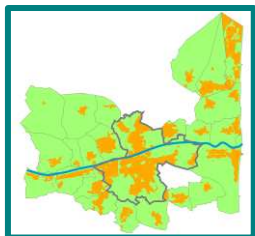
Enfin en terme de propositions nous travaillons sur l'appropriation de jardins en zone urbaine c'est-à-dire se réapproprier les espaces publics et peut être leur redonner le lien entre la consommation et la production. On demande le soutien d'INTERFEL notamment avec les diététiciennes régionales et puis faire le lien entre développement durable, la nutrition notamment en termes de consommation et avec un dernier travail qu'on a engagé sur le commerce de proximité mais surtout dans un premier temps avec les restaurants de ville puisque quelque fois il y a des décalages entre ce qu'ils proposent et ce que porte la collectivité en terme de message.

J REMILLER (Président de la session) : Vous avez parfaitement intéressé l'auditoire. J'ai rencontré votre maire au congrès national des offices d'HLM mais j'aurais l'occasion de le lui dire dans quelques jours que ce que vous nous avez exposé est un bel exemple de ce qui peut se faire dans une collectivité locale ou dans une collectivité territoriale avec en particulier la mobilisation de l'ensemble des acteurs. Vous avez cité les Maisons de Quartiers, les familles, les parents, les enseignants. Je retiens, après le développement de madame la Conseillère Régionale que c'est un problème de nutrition, de santé alimentaire et vous le faites en particulier. C'est ce que je fais également à Vienne la ville dont je suis Maire en Isère auprès des publics fragiles qui sont peut-être les plus éloignés de la consommation des fruits. Ce qui m'a fait plaisir dans le cadre de mes responsabilités nationales c'est que vous liez la production et la consommation. On s'en sortira aussi bien sur la consommation que sur la production que quand il y aura véritablement une symbiose entre ces deux problématiques et puis évidemment le développement durable, le lien avec le bio. En aparté avec Mme Penez, la conseillère régionale de l'Ile de France nous nous demandions comment faites-vous (...) pour franchir le handicap des appels d'offres pour des produits frais. Ensuite, deuxième question, quel est le budget que vous consacrez à ce symbole de consommation dans les écoles et dans les quartiers.

Comment mutualiser les compétences et fédérer les projets de l'ensemble des acteurs locaux?

Patric BERGER

Directeur de l'environnement, Mairie de Perpignan, France



Plus particulièrement sur la mobilisation de l'ensemble des acteurs, comment mutualiser l'ensemble des maillons de la chaîne depuis les producteurs et en particulier ceux qui sont inscrits dans le territoire jusqu'au consommateur qui est bien sûr le public scolaire mais aussi le grand public en général.

Avant de rentrer dans le détail des actions qui ont été menées à Perpignan, pour comprendre pourquoi Perpignan s'est engagé dans cette action je vais reprendre une expression très utilisée par le maire de Perpignan qui est que Perpignan est inscrit dans un archipel, l'archipel du Roussillon situé au sud de la France donc au climat méditerranéen, bassin de production historique de légumes et de fruits au bord de la mer à 30 km de l'Espagne et bientôt à 15 min de Barcelone ville de 3 millions d'habitants grâce au TGV, irriguée par la tête et par tout une quantité de canaux qui ont donné la richesse agricole de ce département et fait de Perpignan une zone qui a conservée cet esprit d'archipel. C'est à la fois la première commune du département avec 120 000 habitants mais c'est aussi la première commune agricole du département avec plus de 2000 hectares de zones cultivées encore sur son territoire. Dans un pays où les grandes villes ont vu disparaître leur *peinture* verte, Perpignan a conservé historiquement cette ceinture verte. C'est tout ce lien entre un héritage culturel et économique, l'agriculture est une économie, et le public urbain qui s'installe et il est de plus en plus nombreux, en milieu méditerranéen il y a une augmentation de population importante donc une pression importante, c'est ce lien que Perpignan a voulu conservé au-delà de la politique Santé.

L'agglomération de Perpignan c'est 200 000 habitants aujourd'hui et la présence de structures économiques importantes. On a parlé de un des premiers bassins de production de fruits et légumes et aussi la présence du marché St Charles sur Perpignan qui est un des 1^{er} marché européen de fruits et légumes en importation et exportation. Il y a donc une implantation des acteurs économiques forts sur ce territoire. Il ya une agriculture tournée vers la viticulture, le maraîchage et arboriculture fruitière et un savoir faire ancien inscrit avec des produits de qualité tel que l'abricot mais aussi tous les produits primeurs, la salade de plein champ, l'artichaut violet etc.

Perpignan c'est aussi engagé politiquement dans une démarche de développement durable et c'est pour cela aussi que le projet Agriculture et Alimentation a pris une importance forte puisqu'il fait parti des 6 thèmes sur lequel Perpignan s'est engagé et les systèmes de la convention cadre que

Perpignan a signé en 2008 avec le Ministère de l'Environnement GRENELLE 2015 donc avec une volonté d'inscrire ce sujet au même niveau que les problématiques énergétiques sur la production d'énergie renouvelable qui est un des thème majeur. Donc, il y a une volonté politique majeur et pas qu'à l'échelle de Perpignan mais bien sûr à l'échelle de la communauté d'agglomération puisque la première éthique agricole entre autres ne peut que se raisonner à l'échelle d'un territoire qui 'dépassé' les limites communales.

En rentrant plus précisément dans le projet Perpignan Ville Pilote Fruits et Légumes et Santé et sur le sujet à traiter. Pour comprendre ce qui a été mis en place, la volonté était de réunir ensemble des acteurs de la filière au sens large, c'est à dire pas que la filière agricole mais aussi la production en passant par les distributeurs en allant jusqu'au consommateur scolaire ou grand public. En 2006, Perpignan profite de l'appel à projet d'APRIFEL et d'INTERFEL sur le programme de l'obésité pour s'investir et devenir une des villes pilotes du projet. Aujourd'hui il y a une vingtaine de villes, à l'époque il y en avait une dizaine. Au tout départ, ce projet a été porté par la direction de l'hygiène et de la santé, Dr Coulon, puisque c'était une orientation santé mais avec la mise en place d'un comité de pilotage dont la présidence a été confiée à Jean Sales qui est à la fois agriculteur producteur sur Perpignan et à la fois président de VINIFLORE et qui a permis de porter le projet perpignanais. Le projet s'est vu confronté, au-delà de la mobilisation des acteurs qui travaillent sur la santé et en particulier le monde de l'éducation, à la mobilisation de tous les acteurs agricoles producteurs du territoire. Il faut savoir que sur Perpignan, une grande partie de la production n'est pas orientée vers le territoire lui-même mais vers l'exportation puisqu'on est un des principaux bassins donc c'est l'idée de mobiliser les acteurs producteurs locaux dans ce projet dans un contact direct avec la population qui a entraîné en 2007 le transfert de ce dossier à la direction de l'environnement que je dirige qui avait déjà l'habitude de travailler avec des acteurs agricoles locaux entre autres dans le cadre d'un comité consultatif municipal qui était là pour parler des problèmes du rapport ville agriculture, présence d'une agriculture dynamique vivant de ses produits sur le territoire de Perpignan, et des relations et des difficultés qu'on rencontre dans l'agriculture périurbaine. Derrière la direction de l'environnement c'était aussi de mettre des moyens humains pour gérer ce projet qui a été nommé chargé de mission sur ce thème pour qu'il y ait une personne qui consacre un temps important à la mise en réseau des acteurs et une chargée de communication car toute action qui est menée doit être à la fois communiqué vers les autres mais aussi une nécessité de donner du lien en terme de communication. Il y a avait ensuite un rythme soutenu de réunions avec l'ensemble des acteurs avec deux dispositifs : un comité technique qui a pour but de définir les actions concrètes qui seront menées pérennes ou événementiel et un comité de pilotage qui a pour but de coordonner l'ensemble de ses opérations et leur donner la lisibilité et de valider les propositions, les idées qui émergent du comité technique.

C'est aujourd'hui plus de 30 acteurs qui sont réunis issus de toute la filière avec une présence des élus et des représentants de l'administration de Perpignan et de la

communauté d'agglomération qui viennent accompagner le dossier, représentants d'APRIFEL et INTERFEL qui viennent soutenir le projet au niveau national. Ensuite c'est toute une série d'acteurs locaux comme le dit le CODES qui assurent entre autres la distribution des repas en restauration scolaire et en particuliers au niveau des maternels et des primaires qui font l'animation sur le plan nutritionnel :

- les professionnels de l'éducation, enseignant, directeur d'école
- les professionnels de la santé tels Mutualité française, l'Hôpital de Perpignan qui est le troisième employeur du département et qui est le principal centre d'accueil au niveau des malades et a donc un enjeu fort sur la santé à la fois sur la cantine professionnelle et à la fois sur les plateaux repas ce qui représente tout un travail sur comment lier fruits et légumes santé et plaisir à l'hôpital car le plaisir de manger est une thérapie
- les acteurs institutionnels, la Direction Départementale d'Agriculture et de la Forêt (DDAF), la Chambre d'Agriculture, l'Institut Méditerranéen des Fruits et Légumes et,
- l'ensemble des associations d'agriculteurs soit dans le domaine du bio ou l'ensemble des agriculteurs qui travaillent sur des produits de qualité d'agriculture raisonnée, les Jardins de Perpignan, Les Jardins St Jacques etc.

C'est un ensemble d'acteur aujourd'hui réuni, c'est 20 actions menées et pérennisées dans le temps dans le domaine du milieu scolaire. C'est aussi au niveau de la politique de l'enfance en dehors du milieu scolaire avec les centres de loisirs la création d'un jardin pédagogique à l'emplacement de l'ancienne station d'épuration en plein cœur des Jardins St Jacques qui est en fait le quartier historique des jardiniers *des portes* de Perpignan. C'est aussi au niveau du grand public avec les événements comme la Fraich'Attitude, la semaine du développement durable ou le salon rêve de nature qui accueille plus de 50 000 visiteurs, les animations de découverte du patrimoine à vélo des exploitations agricoles et aussi tout un travail sur le goût, la découverte des produits qui sont fait dans le cadre *patio* gourmand par exemple avec des produits de Perpignan. Et, c'est dans le cadre de la politique agricole c'est-à-dire du soutien aux acteurs locaux pour derrière soutenir l'effort le contact du monde agricole local vers une consommation locale sans mettre en concurrence agriculture d'exportation et agriculture de proximité. Ce dernier travail a été fait comme par exemple les Jardins de Perpignan qui passaient des partenariats avec des grandes surfaces, des grands distributeurs locaux pour que leurs produits soient sur les étales avec une garantie de qualité et de prix. C'est donc tout un ensemble et au-delà de ça c'est une politique territoriale de préservation du territoire agricole par rapport à l'expansion qu'ont les villes. Aujourd'hui, uniquement sur la



coordination c'est à peu près 150 000€ que met la ville de Perpignan pour coordonner ce projet.

Cela se traduit par un événement majeur qu'est VIS TA MINE réalisé dans le cadre de la semaine Fraîch'Attitude qui a pour but de mettre en valeur l'ensemble de ces actions qui sont menées par l'ensemble des acteurs qui adhère au dispositif. Ce sont des jeux, des expositions, des dégustations qui sont faites avec aussi ce que l'on retrouve aussi dans d'autres villes qui est la remise du prix du petit jardinier avec les écoles qui ont participé au programme européen SHAPE UP autour des jardins pédagogiques de la production de légumes dans leur école et donc de contact. Les enfants sont récompensés avec un diplôme de Petit Jardinier et est remis un tablier un peu comme s'ils rentraient dans l'ordre des Petits Jardiniers pour que demain ils soient les animateurs et les vecteurs de cette consommation de fruits et légumes.

Les clefs de la réussite du projet sont premièrement de se donner pour réunir les acteurs, pour dépasser les objectifs et les modes de fonctionnement sectoriels que chaque acteur a, de ses réseaux etc. et mettre tout ça en commun. Donc premièrement rassurer, deuxièmement coordonner et ensuite faire émerger les projets les plus simples et pragmatiques entre les acteurs c'est-à-dire la mise en commun et créer la transversalité c'est de faire sortir des actions concrètes sur lesquelles les acteurs peuvent s'engager sur lequel la collectivité de la ville de Perpignan puisse appuyer derrière. En enfin c'est la lisibilité, la communication parce qu'on s'était aperçu que chaque acteur avait mené historiquement des actions mais elles étaient dispersées donc c'est réunir tout ça pour en faire une communication commune sur toute l'année, sur tout les événements qui se produisent.

Les difficultés rencontrées sont la mobilisation et les difficultés rencontrées par la crise agricole mais derrière on sent que ce n'est pas une fatalité. C'est de trouver d'autres outils de contact avec la population, avec le consommateur et donc de travailler sur Perpignan, bassin d'exportation, vers une nouvelle logique de contact et de consommation de proximité. Aujourd'hui 7% de la consommation de produit de Perpignan sont consommés sur Perpignan. Demain, l'engagement qu'à la ville dans le cadre du GRENELLE c'est d'aller jusqu'à 30%. C'est un enjeu de développement durable avec le changement climatique, avec le problème du coût du transport etc. c'est une reconversion de cette agriculture vers plus de proximité. C'est aussi un travail sur les modes de distribution. Au niveau de la restauration scolaire, on passe par des transformateurs, des distributeurs de repas, entre autres des groupes comme AVENANCE et on essaie d'inclure dans leur politique une utilisation de produits fruits et légumes mais aussi de produits fruits et légumes produits sur le territoire pour un contact direct. L'accessibilité à ces fruits et légumes de certaines couches sociales et dépasser le débat sur le prix et sur la difficulté de consommation de fruits et légumes est une autre difficulté rencontrée.

Pour finir, cette démarche, au-delà de la politique santé c'est bien un jeu de politique durable puisqu'elle s'appuie sur la première étique de santé publique mais aussi sur l'économie ce qui est important parce que ce sont des facteurs économiques qui font

vivre le territoire donc il faut maintenir une agriculture périurbaine de qualité favorisant les circuits de proximité. Enfin, c'est une politique de territoire, d'aménagement du territoire, de conservation des richesses d'une valeur de ce territoire et encore plus fort présente à Perpignan qui est aussi une zone touristique importante et donc d'accueil fort. C'est donc derrière tout un enjeu de développement durable qui est proposé dans ce projet Perpignan Ville Pilote Fruits et Légumes Santé et Société.

J REMILLER (Président de la session) : C'est un autre exemple de qualité et il faut féliciter également les acteurs locaux. Vous avez dit 7% de consommation et vous voulez à 30%, cela veut bien dire qu'il y a un problème dans ce qui passe entre le moment où il y a la cueillette du fruit et quand il arrive sur les étals. Je vous donne un exemple, lorsque le Président de la République est venu dans ma ville il y a quelques semaines, le kilo de fraises produites était à 6€ et on le retrouvait à 22€ le jour même, c'est un fruit qui se consomme quasiment le jour même. C'est un autre débat que les représentants du parlement traiteront mais il n'est pas inutile que vous me donniez des idées et des conseils et les messages des professionnels présents qui sont à développer. C'est la même symbolique que la ville de Dunkerque, la santé, économie de territoire, développement durable et pour consommer plus il faut un lien entre le patrimoine, la consommation et la production et le soutien aux acteurs locaux et la façon dont la ville de Dunkerque et Perpignan fédèrent ces acteurs locaux.

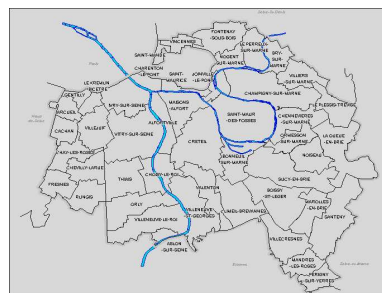
Nutrition Santé Adolescents Val de Marne

Elisabeth FEUR

Conseil général du Val de Marne, Créteil, France

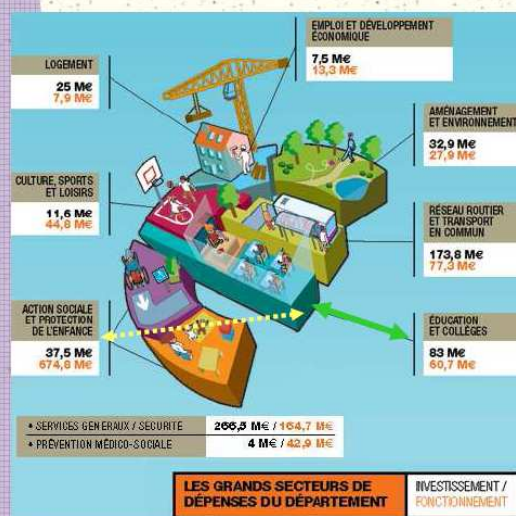
Bonjour, je suis médecin et travaille pour le Conseil Général du Val de Marne. Je vais vous présenter l'exemple d'une politique de promotion de la consommation de fruits, menée dans un département. Je vous proposerai aussi d'examiner le lien entre action et éléments d'évaluation des politiques publiques. Ces travaux sont toujours en cours. Ils ne peuvent se réaliser que réellement menés en partenariat : avec des institutions, des représentants d'organismes professionnels qui émanent d'horizons divers comme l'éducation nationale, la santé, la filière agroalimentaire, des élus locaux, des associations et des associations de parents d'élèves en particulier. Si tout le monde n'y met pas un petit peu de sa volonté et de sa détermination politique et financière, les choses se développent de façon beaucoup trop modeste. Le partenariat avec l'INTERFEL est quelque chose d'ancien. Je remercie M. PITON. Avant qu'INTERFEL ne lance ses politiques partenariales, il a été très fortement moteur et relais du travail que nous avons pu mener avec des grossistes en fruits et légumes.

Pour ceux qui ne connaissent pas le fonctionnement des politiques administratives et la géographie locale, le département du Val de Marne est un département de la proche couronne parisienne de 1,2 millions habitants, au Sud Est de Paris. Il y a 47 communes ; c'est une urbanisation très dense et un quart de la population a moins de 20 ans. Ce département est traversé par la Seine et par la Marne.



Le conseil général est une administration placée sous la responsabilité d'une collectivité d'élus au suffrage universel direct, renouvelés par moitié tous les 3 ans. C'est une grosse administration, dont les compétences se sont élargies depuis plusieurs années par les différentes lois de décentralisation. Actuellement cette administration représente 8 000 employés et un budget de 1,75 milliard €, avec des compétences très diverses qui tiennent à l'aménagement du territoire, au développement économique, au réseau routier, au transport, au logement, à la culture, aux sports et aux loisirs.

Le Conseil général du Val de Marne



- Des élus**
 - 49 conseillers généraux
 - Suffrage universel direct
 - Renouvellement $\frac{1}{3}$ / 3ans
- Une administration**
 - 1.75 milliard €
 - 8.000 employés
- 104 collèges
- 83 millions € investissement
- 800 personnes (T.O.S.-2007)

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Une grosse part du budget est consacrée à l'action sociale et à la protection de l'enfance ; et une part plus modeste à l'éducation et en particulier aux collèges. Notre démarche s'inscrit entre une politique sociale santé et famille (flèche jaune) et la politique de l'éducation et des collèges. Celle-ci est devenue un gros pôle de compétence, par le nombre de personnes qui sont maintenant concernées, techniciens et ouvriers de services.

Dans le département il y a 104 collèges publics, 50 000 collégiens : ce qui représente à peu près 30 000 repas servis par jour. Les compétences réglementaires concernant les collèges sont des compétences anciennes, inscrites dans le cadre des lois de décentralisation. Elles étaient avant tout consacrées à l'entretien des bâtiments et depuis 2004 elles concernent progressivement la gestion d'un nombre important de personnel. Autour de la restauration scolaire on a maintenant un levier très fort et en prise directe sur les personnels et sur la qualité des repas qui sont servis. On est entré dans une phase où la collectivité peut investir beaucoup plus concrètement une responsabilité portée auparavant par l'Etat via le ministère de l'Education nationale. Le département du Val de Marne définit aussi des orientations politiques propres : elles ont trait au soutien financier apporté aux familles en difficulté pour payer la facture de restaurant scolaire. Ces orientations politiques propres datent de 1990. Notre programme vise la santé nutritionnelle des adolescents. Comme vous le voyez il est parti de quelque chose de très marginal eu égard aux compétences obligatoires de cette collectivité ; petit à petit il trouve, du fait des lois de décentralisation, des leviers politiques propres qu'il s'agit maintenant d'investir totalement.

Notre démarche est ancienne et s'inscrit dans une démarche de santé publique. Pour rejoindre le sujet de l'évaluation et de l'action, ce qui a fondé notre action totalement volontariste, était une étude diagnostique. Elle avait permis qu'en 1998

nous disposions de données sur la santé nutritionnelle des collégiens et des lycéens de ce département.

Elle avait posé la question de la fréquence du surpoids et de l'obésité en particulier chez les plus jeunes de cette population adolescente. On a donc un diagnostic au départ (1998), une phase de conception (2000), forcément participative et collaborative parce que sinon les choses ne se passent pas correctement. Ensuite on détermine un modèle qu'on expérimente (2001) et depuis 2002 on développe ce modèle. On a parlé de la pérennité des actions dans le temps. Une des forces de nos interventions c'est peut-être de reproduire depuis 2002 toujours, le même schéma d'intervention. C'est à la fois une de ses forces mais c'est peut-être aussi un de ses freins. On a donc mis en place depuis 2002 trois axes d'intervention qui sont toujours les mêmes. Ils visent d'une part à promouvoir la consommation de fruits dans une population adolescente de collégiens et lycéens, d'autre part à développer une éducation critique à la consommation alimentaire pour ces mêmes adolescents (2). Nous avons un autre levier d'intervention ; il concerne le dépistage et la prise en charge de l'obésité (3), toujours pour les adolescents. Tout ceci est en place depuis 2002. En 2005-2006 nous avons décidé de mettre à disposition de l'ensemble des acteurs présents des éléments contextuels qui leur permettent d'évaluer ou de porter un regard sur les actions menées. A l'époque où nous avons mené cette évaluation, 1/5 de la population des collégiens et des lycées publics du Val de Marne avait été touchée par nos dispositifs de promotion de consommation de fruits ou d'éducation critique à la consommation alimentaire. 75% des élèves de 5^{ème} avaient bénéficié de notre action de dépistage et éventuellement de prise en charge de l'obésité.

Premier axe des actions : la promotion de la consommation de fruits. Notre action est en fait ponctuelle. Il s'agit d'une action de promotion qui se passe 3 fois dans l'année. Le levier qu'on a choisi est une action de valorisation par la dégustation, avec des outils de communication qui valorisent le fruit comme aliment savoureux à déguster et à découvrir. Cela peut se passer au restaurant scolaire ou en dehors du restaurant scolaire ; c'est une orientation qu'on essaie de développer, puisque à ce moment là on peut toucher l'ensemble des élèves. En 2007-2008, sur l'ensemble des collèges et lycées du département cela touchait 65 établissements, 30 villes et représentait 30 tonnes de fruits et 20 000 convives pour un budget fruit 50 000€ par an. Une autre part importante du budget finance l'animation du réseau et la création des outils pédagogiques.

Le travail d'éducation critique à la consommation alimentaire touche 115 classes donc à peu près 3 000 élèves. Je veux souligner que nous essayons de faire un lien direct en matière d'éducation à la consommation alimentaire avec un réseau d'entreprises qui accueillent les enfants. On essaie de travailler sur la dimension artistique avec la publicité et depuis un an sur l'analyse sensorielle et gustative; la partie message nutritionnel est de plus en plus réduite, sans être absente, nos

vecteurs pédagogiques sont délibérément concrets et orientés vers l'éducation à la consommation et non pas vers l'éducation nutritionnelle stricto sensu.

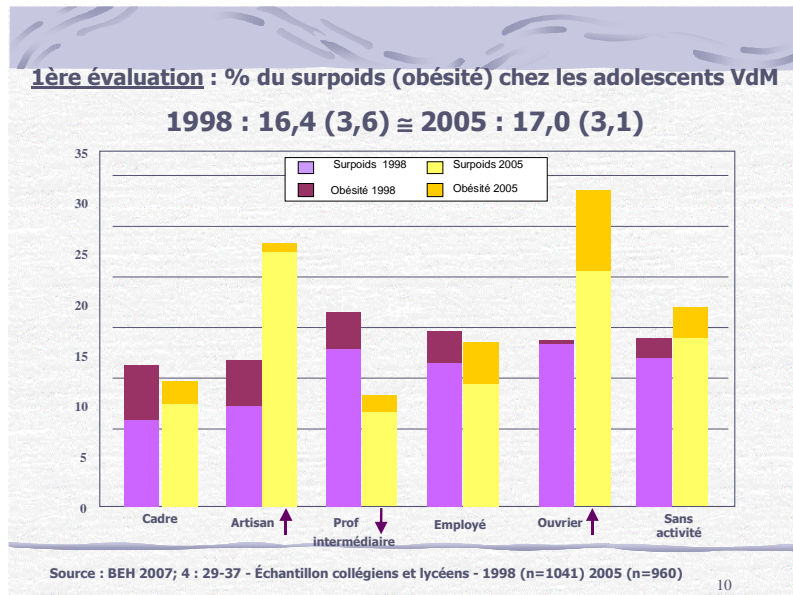
Dans le cadre de notre dispositif de dépistage et de prise en charge du surpoids nous sommes centrés sur la population des collégiens, en particulier du niveau scolaire de 5^{ème} (13 500 jeunes). En terme de prise en charge nous avons monté des ateliers éducatifs qui s'appellent « Manger mieux, Bouger plus : des plaisirs qui s'apprennent ! » Ils sont destinés à des adolescents d'âge collège dont le surpoids ou l'obésité nécessite une prise en charge. Je veux souligner plusieurs points dans cette prise en charge. Dans un vocabulaire médical elle relève de l'éducation thérapeutique ; dans un vocabulaire social elle relève du travail éducatif et social. Ces ateliers sont implantés dans des structures de proximité, dans des centres sociaux, on est vraiment dans une activité très locale, on travaille aussi avec les parents. Sans que l'on veuille particulièrement viser une population défavorisée, la réalité est que ces ateliers pratiques d'éducation thérapeutique touchent une population en réelle difficulté sociale.

Le point est de faire le lien à l'échelle d'un département entre les actions présentées plus haut et des éléments d'évaluation. Ce qui avait fondé notre action initialement c'était un diagnostic de type épidémiologique porté sur la santé nutritionnelle des collégiens et des lycéens. Nous avons avec l'aide d'experts scientifiques mis en place 2 types d'évaluation, en 2005-2006 : une évaluation qui portait sur les adolescents et une autre qui portait sur la qualité de l'assiette servie en restaurant scolaire en collèges et en lycées.

Sur le thème qui nous intéresse j'ai extrait quelques résultats de ces deux études. La première qui porte sur la santé des adolescents est une étude épidémiologique. Elle nous a permis de mettre en relation une photographie représentative de la santé des adolescents telle qu'elle existait en 1998 et telle qu'on pouvait l'observer en 2005 avec à chaque fois un échantillon d'à peu près 1000 adolescents.

Le premier résultat intéressant c'est qu'on constate qu'entre 1998 et 2005, grosso modo, il n'y a pas de différence statistique à prendre en considération entre la fréquence du surpoids, obésité incluse telle qu'elle était observée dans cette population en 1998 et en 2005. Quelle est notre part de responsabilité là-dedans ? Elle doit y être pour quelque chose, même s'il est difficile d'inférer ce résultat très encourageant à une politique spécifique. Dans un contexte de vie influencé par de nombreux leviers beaucoup plus puissants que celui d'une politique de santé qu'elle soit nationale (PNNS) ou qu'elle soit locale telle que nous la menons. Il est néanmoins raisonnable d'imaginer que ce résultat procède un petit peu du travail que nous avons réalisé. C'est donc un élément satisfaisant. Ce qui l'est moins c'est que si globalement la prévalence du surpoids et de l'obésité s'est stabilisée, c'est une vérité totalement inégale pour tous. Par exemple, si on considère la profession des parents, on voit que les enfants issus des milieux les plus favorisés sont ceux qui

étaient et sont toujours les moins concernés par la fréquence du surpoids et de l'obésité alors que cette pathologie chronique ou en tout cas ce problème de santé s'est fortement amélioré dans les familles de professions intermédiaires et qu'elle s'est aggravée en particulier chez les enfants dont les parents sont issus du milieu artisan ou ouvrier.



L'autre élément d'évaluation que je souhaite partager avec vous concerne la qualité de l'assiette servie dans les restaurants scolaires. Notre levier d'intervention sur la restauration scolaire est modeste dans notre dispositif. On promeut la consommation de fruits à trois reprises pendant une semaine dans l'année en collaboration avec des professionnels « militant ». On les appelle, on les sollicite sur la base du volontariat, à participer aux semaines promotionnelles du fruit, au même titre qu'on sollicite des enseignants ou des personnels de santé. Pour cette étude sur la qualité de l'assiette, nous avons demandé un énorme travail aux gestionnaires – et ils l'ont accepté - ce qui nous permet de présenter des données représentatives de tous les collèges publics du département. Ils nous ont adressé l'ensemble de leurs relevés d'achat de fruits pendant toute une année civile, l'année 2005. On a donc pu, avec l'aide d'un prestataire extérieur, quantifier et qualifier la ration de fruits proposée sur l'assiette, en moyenne, pendant toute une année scolaire. Ce que je présente ici, s'appuie sur ce type de données : le poids moyen de fruits proposés sur l'assiette d'un convive, par jour, durant toute l'année 2005.

2ème évaluation : qualité de l'assiette restaurant scolaire

La ration en fruits

Ration (achats 1 année)

Poids brut moyen/convive/jour

	Tous les collèges	Programme		établissements ZEP
		Oui	Non.....	
Fruits crus	99 g	133 g	70 g	55 g
Fruits cuits	9 g	9 g	10 g	10 g
Total	108 g	142 g	81 g	58 g
Coût denrées €	1.87	1.80	1.92	

PNSA => ration quotidienne + 80% de fruits

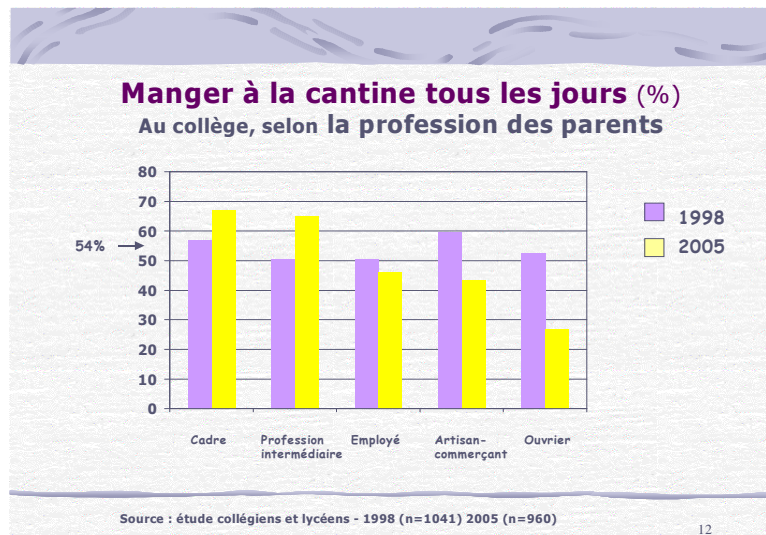
Source : étude établissements publics 2005 : échantillon représentatif 63/104collèges

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On voit que la ration de fruits proposée sur l'assiette s'élève en moyenne, dans l'ensemble des collèges publics de ce département, à 108 grammes. Elle est très largement constituée avant tout de fruits crus et très peu de fruits cuits. Elle s'inscrit dans un coût moyen de denrées alimentaires, pour le repas de 1.87€. Que se passe-t-il avec les établissements avec lesquels nous travaillons sur la base du volontariat pour mettre en place ces 3 semaines promotionnelles du fruit ou bien pour mettre en place un travail d'éducation à la consommation alimentaire, par rapport aux établissements qui ne participent pas à notre programme ? Ce qu'on constate nous satisfait beaucoup. On se rend compte que la ration moyenne de fruits proposée tout au long de l'année est 80% supérieure dans les établissements avec lesquels nous travaillons, dans le cadre de cette promotion 3 fois dans l'année, qu'elle ne l'est par rapport aux établissements où nous ne travaillons pas. Elle s'inscrit dans un coût moyen des denrées sur l'ensemble des repas servis dans une année civile, qui est moindre encore de ce qu'il est dans les établissements avec lesquels nous ne travaillons pas. Ce qu'on a envie de dire, ce qu'on a envie de penser, c'est que, lorsque les établissements, les gestionnaires, les cuisiniers, la communauté institutionnelle professionnelle sont sensibilisés à l'importance des fruits et légumes, il est possible, sans augmenter le coût des denrées alimentaires, de leur accorder une place importante dans la ration proposée aux convives. A l'extrémité droite du tableau figure la ration en fruits des établissements qui recrutent les populations les plus en difficultés, établissements situés en Zone d'Education Prioritaire (ZEP) : c'est une catastrophe. C'est-à-dire que la ration moyenne de fruits qui est proposée dans une année à ces élèves est epsilon, 58 grammes, c'est un abricot à peu près, donc très peu de chose. Un autre élément d'évaluation porte sur la typologie des fruits c'est-à-dire la diversité et la fréquence à laquelle ils sont présentés.

On s'intéresse sur cette diapositive aux achats en fruits et aux menus. On a en fait demandé aux établissements de nous envoyer l'ensemble des menus qu'ils affichent à l'entrée du restaurant scolaire sur toute l'année, sur 9 mois de scolarité. Parmi des 9 mois de menus nous en avons tiré 3 au hasard. Nous avons défini la diversité de fruits par au moins 12 fruits différents proposés dans l'année et au moins 3 variétés différentes pour au moins 2 fruits sur ces 12. Le tableau présente pour l'ensemble des collèges et selon ensuite qu'ils participent ou non à notre programme, des résultats concernant la diversité des fruits ainsi définie. Il montre que dans les établissements avec lesquels nous travaillons, il y a une diversité un petit peu plus grande. Mais la différence portant sur la diversité des fruits est beaucoup moins frappante et significative qu'elle ne l'est sur la quantité de fruits proposée aux élèves. En termes de fréquence, ils sont aussi proposés plus souvent. Vous savez qu'il existe des recommandations nationales dites du Groupe Permanent de l'Evolution des Marchés des Denrées Alimentaires (GPEMDA) et maintenant du GERMEN. Elles formulent des normes pour la qualité de la restauration scolaire. Elles désignent des aliments et des plats dont il convient de limiter la consommation car défavorables à la santé des enfants, et d'autres qu'il convient d'encourager parce que favorables à la santé des enfants. Ces recommandations se font par rapport à 20 repas et on regarde comment l'ensemble des différentes rubriques d'aliments ou de plats sont proposés 1 fois, 2 fois, 3 fois etc. au moins ou au plus selon le type de plat sur 20 repas. On voit comment la ration en fruits définie auparavant en termes de grammage, en termes de diversité, et maintenant en termes de fréquence de proposition sur 20 repas est proposée aux élèves. On voit qu'à moins d'un repas sur deux la ration proposée aux enfants comprend des fruits : plus précisément 8 fois sur 20 repas, on propose un fruit au repas. Dans les établissements avec lesquels nous travaillons ces fruits sont proposés lors de 10 repas sur 20. Globalement, en terme de quantité la ration en fruits proposée par les établissements de notre programme est nettement meilleure que dans les autres établissements, en termes de fréquence un petit peu mieux et en terme de diversité un tout petit peu mieux.

Quelles conclusions et questions peut-on tirer de ces résultats ? Il y a des points clairement positifs : la stabilisation de l'excès pondéral entre notre diagnostic avant action en 1998 et notre diagnostic en cours d'action en 2005 ; une ration de fruits considérablement supérieure tout au long de l'année. Il y aussi des points, toujours les mêmes, à améliorer, des cibles à prioriser : les familles défavorisées. La fréquence du surpoids s'est accentuée dans les populations les plus défavorisées. On parle beaucoup du restaurant scolaire mais la réalité est que les enfants issus de ces familles défavorisées sont ceux qui fréquentent le moins les restaurants scolaires. 50 000 collégiens, 30 000 repas servis, donc une fréquentation de 55% ; sur ces 55% l'origine sociale des parents est très diverse.



Quand on a des parents cadres ou enseignants c'est le top de la fréquentation: 65% des enfants vont à la cantine. Mais dans d'autres familles inscrire son enfant à la cantine n'est pas forcément le meilleur arbitrage pour nourrir son enfant à midi : enfants issus de familles dans lesquelles les revenus, la disponibilité des parents, des raisons culturelles, d'accès au travail, de disponibilité financière irrégulière. Pour ces enfants, la restauration scolaire n'est pas forcément le meilleur vecteur à utiliser pour promouvoir la consommation de fruits. Du fait des lois de décentralisation on dispose maintenant de leviers réglementaires qui sont nouveaux mais est-ce que cela va renforcer les inégalités ? Notre administration est de 8 000 personnes. L'intégration des Techniciens et Ouvriers de Service (TOS) du fait des récentes compétences réglementaires a augmenté la masse salariale de près de 10% soit 800 personnes. Ces techniciens et ouvriers de services sont les personnels qui préparent les repas, les servent etc. C'est donc une énorme partie de l'agent public mais cet argent public est centré sur le service rendu aux enfants qui vont à la cantine et ces mêmes enfants sont issus des familles les plus favorisées. Donc, dans le choix de la gestion de l'argent public, on a finalement commencé un programme et un travail un peu à la marge de toutes les compétences réglementaires de cette collectivité, on se retrouve maintenant avec un levier d'action qui est très important mais finalement ce levier d'action publique ne risque-t-il pas, même avec la meilleure volonté des collectivités publiques, de renforcer quelque part encore les inégalités concernant la santé nutritionnelle des adolescents ? Et enfin, ces normes, ces recommandations toujours sur le restaurant représentent une quantité de travail monstrueuse à mettre en place en terme de formation. Quel est le premier objectif des services de formation des TOS ? Eviter le risque d'infection alimentaire donc une formation HACCP. Alors on fait le point sur le nombre de personnels à former, le turn-over, la gestion des heures supplémentaires dans le cadre des 35h etc. Pour notre compte nous rappelons le cadre réglementaire nutritionnel et la nécessité d'une formation à l'éducation alimentaire. On nous répond qu'on en a bien pour 2 ou 3 ans déjà à mettre en place le programme de formation HACCP, celui sur les compétences

culinaires, qu'on verra s'il reste un peu d'argent pareil pour l'éducation alimentaire....Affaire à suivre ! Je vous remercie de votre attention.

J REMILLER (Président de la session) : Je partage la plupart de des termes de votre intervention et en particulier la priorité à l'aide aux familles défavorisées qui n'ont pas accès à la restauration. Cela répond à ma question où des familles peuvent accéder à la consommation des fruits et d'autres ne le peuvent pas et le font grâce à la restauration scolaire mais cela engendre d'autres difficultés. Je suis d'accord avec vous qu'il va falloir à un moment ou à un autre prendre en compte le rôle de l'Etat avant les interventions. Cela est très intéressant parce que c'est à l'échelle d'un département et j'ai été très attentif à ce que vous avez dit qui se trouve dans l'assiette d'un collégien avec l'aide en particulier du Conseil Général. Cette sensibilisation d'ailleurs les producteurs de fruits, c'est INTERFEL qui le dit (...), finalement c'est un problème de sensibilisation, c'est un problème de communication qui doit être réfléchi entre la filière et c'est une démarche de valorisation des fruits français et ensuite comment on fait pour l'accès à la consommation de ces fruits dans les départements, on vient d'en avoir un exemple ou dans les villes. Je me permets de suggérer aux responsables organisateurs de ce colloque peut-être que les intervenants puissent transmettre leurs interventions à l'association des maires de France et au journal de maires de France pour que tous les élus locaux qui reçoivent cette revue à mes yeux est très importante puisqu'elle présente toutes les expériences qui se font dans les collectivités locales ou territoriales, puissent s'approprier à leur tour ce dossier. J'ai été aussi intéressé par la diversité des fruits, non seulement dans l'assiette mais aussi la diversité des fruits à l'intérieur de cette assiette et le lien entre l'éducation de la consommation par l'éducation artistique et plastique etc. c'est très intéressant.

Q&A

PUBLIC (Christiane TERRIE de l'association Familles de France) : L'association Familles de France est une association familiale qui en 2001 a lancé dans une des écoles de la mairie de Paris 9^{ème} avec Jacques Bravo qui en est le maire. Nous voulions supprimer les distributeurs à la fois les distributeurs mécaniques dans les écoles qui distribuaient des friandises, gâteaux etc. et nous voulions aussi essayer de supprimer les petites pochettes de lait. Je dois dire que cette action qui a été lancée en 2001 n'a pas eu énormément de retombées sur Paris et je reconnais, Monsieur Remiller, que si vous n'aviez pas été là pour nous soutenir à tous les niveaux et au niveau de l'Assemblée mais aussi au niveau de votre région je pense qu'on n'en serait toujours pas là aujourd'hui. J'ai beaucoup apprécié tous les intervenants. Pour moi, qui depuis une dizaine d'année ne gère plus de restauration scolaire, j'ai vu l'évolution et c'est très intéressant parce que je me souviens il y a 25 ans quand j'ai voulu lancé des fruits dans la restauration scolaire de mon département on m'a dit que ce n'était pas mon métier et de m'occuper de mes affaires en faisant manger de gâteaux etc. pourvu que ça coûte pas cher. Je trouve que c'est vraiment fantastique les uns et les autres ce que vous avez pu faire. Je voudrais juste intervenir sur des petits points qui aujourd'hui nous posent réellement question. D'abord sur le fait que nous sommes aujourd'hui dans une société de consommation qui fait qu'on consomme à tout prix et d'une manière inverse et on voit d'ailleurs arriver une publicité à la fois contradictoire. Je m'explique, au niveau de la télévision par exemple la publicité vous dit à un moment donné mangez des fruits 5 fois par jour etc. et puis après on vous fait avaler n'importe quel cochonnerie. Il y a un problème de l'accès aux fruits, vous l'avez dit et je pense qu'il y a besoin d'une TVA qui soit voire jusqu'à 0% au niveau des médias il y a effectivement une parole à donner de façon à ce qu'on puisse avoir une publicité correcte. En ce qui concerne la formation je pense que le personnel municipal qui aujourd'hui a besoin d'être formé ce sont les assistantes maternelles et les enseignants surtout dans les petites écoles pour apprendre à éplucher un fruit etc. et l'apprentissage dès la petite enfance est quelque chose de faisable et de nécessaire. Nous réfléchissons au niveau de l'association d'essayer de voir comment au niveau des familles puisque le coût est extrêmement élevé d'avoir une sorte de coopérative de façon à réduire les prix.

J REMILLER : Votre proposition me semble intéressante, il y a des expériences en France à ce titre là.

P MARTIN : Sur la formation du personnel municipal qui relève du CNPT (Centre National de Personnels Territoriaux) il y aura prochainement un colloque sur les thèmes de santé de manière générale parce que je pense qu'il faut faire attention aussi au saucissonnage de la formation des professionnels mais en tout cas cette approche globale des problématiques de santé par les personnels municipaux me semble tout à fait intéressante et notamment dans les établissements scolaires. Mais il

y aura un colloque au CNPT qui depuis quelques temps après la première phase du PNNS s'est approprié les questions de santé comme un thème de formation.

E FEUR : Pour illustrer, toujours dans le cadre de formation, la façon de s'y prendre. On s'y prend toujours par les côtés et par les bords en termes de formation des professionnels cuisiniers ou des éducateurs voire des personnels de santé en charge de promouvoir le goût des fruits et l'éducation alimentaire. Nous avons avec INTERFEL monté des ateliers culinaires et donc Marion Pénaud coté Conseil Général et Claire Espalieu coté INTERFEL étaient avec des cuisiniers, des enseignants et peut-être elles peuvent dire un mot dont la façon dont les choses se déroulent.

PUBLIC (Marion PENAUD) : L'idée de ces ateliers est juste de réunir des professionnels et de partager ensemble, d'échanger autour des idées concrètes donc à la fois de préparation des fruits et légumes, de présentation, de valorisation de ces produits. Et hier on était avec des infirmières, des enseignants, des cuisiniers qui ont tous échangé autour de ces problématiques.

J PENEZ : Simplement, dans les informations à faire passer, il convient de rectifier certaines choses. Je pense en particulier, sur les deux questions que vous soulevez, à la question sur le coût ; dans nos modules de présentation on a une partie où on parle des prix et où on fait la comparaison entre le prix d'une pomme et le prix d'un pain au chocolat. Le lycéen qui en sortant, va s'acheter un pain au chocolat, n'a pas le réflexe d'acheter une pomme et pourtant la pomme coûte beaucoup moins cher. D'autre part, pour lever ces freins sur la forme ou la difficulté, parlant toujours de la pomme parce qu'on a fait cette année cette opération pomme, mais nous avons des producteurs qui ont travaillé sur des formes un peu élaborées de pommes, notamment un producteur qui fait des pommes tranchées qui sont en sachets très pratiques à transporter, à consommer et on n'a plus ce frein de l'épluchage. Il y a donc des choses à mettre en place à la fois sur l'information sur les vrais prix des produits et sur la praticité et la façon de mettre à disposition du consommateur.

J REMILLER : La pomme est la première production de fruits français ensuite c'est la pêche nectarine et je crois qu'effectivement qu'il faut encourager la consommation de pomme qui est un fruit excellent.

PUBLIC (Jean-Pierre LEBRUN, chef de projet auprès de Michel Barnier sur le dossier de la distribution des fruits dans les écoles) : Pour répondre à Mme Terrie de l'association des familles de France, dans le cadre du projet de distribution de fruits dans les écoles, le Ministère de l'Agriculture va passer prochainement une convention avec le CNPT, qui est chargé de la formation en cadre d'emploi de fonctionnaires territoriaux, pour faire des échanges d'expériences entre les collectivités et les agents de la fonction publique territoriale et aussi mettre en place des modules de formation que ça soit au niveau des ATCEM des responsables de la

restauration scolaire ou y compris des chefs de service de cantine de restauration scolaire. Juste pour information.

J REMILLER : Les ministres de l'Agriculture précédents nous avaient écoutés mais pas entendus sur dossier alors que Michel Barnier nous a écouté, nous a entendu et met en place cette faisabilité qu'il a présenté à l'Assemblée Nationale le 4 Juin auprès de notre groupe.

PUBLIC (Anne-Blondine ELLIAS) : Je suis chargée de sensibiliser la filière légumière bretonne à la nutrition et de les conseiller dans leur actions, aussi chargée de coordonner au niveau d'une autre échelle le Pays de Morlaix, la sensibilisation du grand public et des enfants à la consommation de fruits et légumes et enfin je suis élue délégué à la restauration scolaire à Morlaix. J'ai donc deux questions. Est-ce qu'au niveau de la mutualisation des moyens, les grandes communes que vous êtes partagent tous les documents mis à disposition avec d'autres communes ? C'est à dire tout ce qui a été rédigé, imprimé, communiqué, peut-il être rendu disponible ? Et enfin au niveau des aides financières est-ce qu'il y a eu des cofinancements etc. par d'autres structures gouvernementales ou privées ?

P BERGER : Sur la mise à disposition de documents, oui, les documents peuvent être consultables.

PUBLIC (Sylviana CHIARENA, Infirmière en chef conseillère technique auprès du recteur académique de Bordeaux) : Monsieur Barnier est venu lancer la campagne de fruits dans les écoles et je voulais vous dire que l'académie de Bordeaux a un projet régional nutrition santé qui a été primé par l'OMS en novembre 2006 dans lequel nous avons un volet amélioration de l'offre alimentaire dans les établissements scolaires dont le principal point est « les fruits donnés dans les établissements » avec aussi la création de fontaine à boire. Je voulais dire à Mme Penez qui est intervenu sur les lycées si vous avez pensé à travailler mais en tant que conseillère régionale je pense que vous ne pouvez pas le faire sur le foyer des élèves qui continue à vendre des choses qui malheureusement de font pas partie des PNNS et surtout de viennoiseries. Nous avons énormément de mal à travailler là-dessus parce que c'est objet de financement interne pour l'établissement scolaire. Ceci est ma première question. La deuxième question est de savoir pourquoi dans la loi de santé publique 2004 où on a interdit les distributeurs, je pense qu'il aurait fallu laisser distributeurs de fruits parce que nous avons eu des expérimentations dans l'Académie de Bordeaux avant la loi ou nous avons installés des distributeurs qui avaient été créés mais ceux là sont interdits. Est-ce que cela peut se reprendre ? Est-ce que cela ne peut pas se reprendre ? Nous avons donc un projet dont va-vous parlez ma collègue.

PUBLIC (Caroline CARRIERE, ingénieur agronome spécialisée en Nutrition santé): Je gère justement d'essayer d'améliorer l'offre alimentaire au niveau des foyers des élèves parce que depuis la suppression des fameux distributeurs automatiques une enquête en Aquitaine a montré que quasiment tout les aliments tout les aliments qu'on trouvait dans les distributeurs automatiques se sont retrouvés au niveau du foyer des élèves. On essaie de remplacer ces produits qui sont quand même gras et sucrés parce que ce sont majoritairement des pains au chocolat, des barres chocolatées ou des sodas par des fruits et également des petits pains qui peuvent être agrémentés d'abricot ou des choses comme ça. C'est vrai qu'on a des difficultés parce que ce sont des financements internes et les bénéfices servent à financer des voyages ou des activités sportives et du coup on a du mal à mettre en place cette vente de fruits. On passe souvent par les fournisseurs de fruits de la restauration scolaire mais on a du mal à faire pérenniser cette vente de fruits dans les foyers.

PUBLIC (Jean SALLE producteur de légumes à Perpignan et Président de VINIFLORE, l'office de fruits et légumes du vin et de l'ornemental): Plus accessoirement mais de façon très passionnée je suis président de la commission accessibilité de l'INTERFEL et très associé à cette action qui est tout à fait remarquable qu'est ce travail de réflexion. Je crois que le problème du prix est un problème central et c'est un problème effectivement tout à fait sensible. Parler de la difficulté de l'accessibilité des plus démunis par rapport à cette part de l'alimentation et vouloir tirer des conclusions qui sont des conclusions de marché à partir de cela me paraît être très dangereux parce que si on parle que du prix et de la difficulté de certains pour définir les produits ne me paraît pas tenir compte de certaines réalités qui sont que dans cette moitié de l'assiette censée être constitué de fruits et légumes, la part des fruits et légumes en termes de coût et le prix moyen dans une année dit le CREDOC et SOFRES de 1,90€ par rapport à une autre moitié qui est entre 10 et 16€. Donc pour dire comme ça se dit dans les journaux et comme je l'entends ici que les fruits et les légumes sont trop chers me paraît être un raccourci qui ne correspond pas à une réalité et notre travail ici est de dire ce que peut être la réalité. Ce problème du prix est tout à fait essentiel pour la rentabilité des entreprises et pour la durabilité alors que l'on sait que la plupart des entreprises fruitières et maraîchères de France disparaissent à un rythme deux fois plus élevé que les autres entreprises agricoles en France. Si on veut continuer à conserver une ressource à proximité autour des villes, il faut faire ce qu'il faut et vous êtes bien placés monsieur le député, au titre de la LME par exemple puis il y a un certains nombre de conclusions peut-être à mettre en place même s'il est déjà un peu tard, je ne sais pas ce qui a été prévu par l'Assemblée mais je crois, rien de miraculeux à cet égard là alors qu'on est réellement au cœur du problème. Voilà ce que je voulais situer. Je souhaite qu'il y ait un groupe qui se constitue pour qu'on engage une discussion sur la phénoménologie du prix et de la valeur. Quelle est la valeur alimentaire comparée ? Quel est le coût et la valeur rétribué à la production ? Vous situiez un écart sur des chiffres qui me paraissaient

tout à fait extraordinaires mais en tout cas significatifs en terme d'exemple. Quel est le prix comparé aux consommateurs par rapport à des bienfaits au point de vue de la nutrition par rapport aux autres aliments, par rapport aux autres services sociaux rendus ? Et constituer un groupe autour de cela avec des organisations de consommateurs et des parlementaires et des scientifiques pour faire l'analyse de la valeur entre le besoin de services attendus me paraît tout à fait essentiel.

J REMILLER : Si le débat à l'Assemblée Nationale a été retardé c'est qu'il y a d'abord un autre débat sur le sujet de la réforme de la constitution mais surtout parce que justement on essaie de trouver le juste milieu entre chaque député entre sa propre conscience et son vote. C'est vrai que quand je prends la presse nationale et que je vois les légumes sont trop chers si je ne vais pas au fond de l'article je me dis qu'effectivement ils sont très chers les fruits mais ils ne sont pas si chers quand on les cueille et sont peut-être trop chers à l'autre bout. Il va falloir trouver des solutions là-dessus.

PUBLIC (Jean SALLE) : Pardonnez moi de revenir mais sur le particularisme des fruits et légumes monsieur le député, monsieur le président du groupe parlementaire des fruits et légumes, il y a quelque chose de particuliers à faire. Ce qui se dit aujourd'hui à l'UNESCO et ce qui se dit régulièrement aujourd'hui par les remontées scientifiques que nous avons sur les équilibres nutritionnels nécessitent que l'on préserve la ressource là où elle est. Je souhaiterais qu'une porte reste entrouverte puisque la LME a écarté les fruits et légumes du champ de la loi, peut-être à juste titre.

J REMILLER : L'assemblée des fruits et des légumes va revenir là-dessus et notre groupe de fruits et légumes va justement être le moteur en quelque sorte des propositions.

Sur les distributeurs, nous allons y revenir. Nous étudions la possibilité de proposer au gouvernement de mettre en place des distributeurs de fruits. C'est le problème de la consommation car ce sont très fruits consommables très rapidement, autant vous pouvez laisser des gâteaux dans un distributeur pendant très longtemps, autant dans un distributeur vous ne pouvez pas laisser des cerises très longtemps.

J PENEZ : Effectivement, nous avons la même difficulté que vous à résoudre cette question sur les foyers d'élèves où nous ne sommes pas maîtres. Merci Monsieur Remiller de répondre à notre préoccupation qui est, depuis que nous avons lancé ces opérations pilotes y compris d'ailleurs avec le Val de Marne où nous avons fait des tests de distributeurs de pommes dans les lycées, l'interdiction généralisée des distributeurs. Juste pour information, cela n'est pas qu'un problème de conservation parce que j'étais il y a peu de temps en Italie où dans les écoles italiennes il y a des distributeurs de fruits dans les écoles et ils ne distribuent pas que des fruits dans la journée, il y a des fruits qui se gardent plusieurs jours, il y a une date de conservation

au même titre que nous avons dans les entreprises des distributeurs de sandwiches qui sont aussi à 48 heures. Donc il y a un système de gestion des distributeurs qui est très facile à faire, ce n'est pas une question de date limite c'est une question, je crois, de volonté.

J REMILLER : Sensibilisation, communication, volonté c'est ce qu'il faut retenir lors de cette session.

PUBLIC (Bernard PITON, Président d'APRIFEL) : Puisque vous reprenez le dossier sur les distributeurs auquel nous avons été très touchés il y a quelques années, savoir que ce n'est pas rentable par rapport à la barre de Mars, par rapport à du Coca Cola ou par rapport à la problématique soulevée tout à l'heure, on s'en était rendu compte lorsqu'on avait fait l'expérimentation et qu'il serait important, peut-être avec la mission confiée à Jean-Pierre Lebrun, de bien piloter les limites du systèmes. Deuxième nature d'intervention c'est pour essayer de répondre en partie aux questions que vous avez suggérées en début de votre intervention sur les marchés publics. Je vais faire une partie désagréable et une partie plus agréable. La partie désagréable, lorsqu'on est sur le débat actuellement de distribution de fruits dans les écoles, on est dans du marché public et il n'est pas possible dans le marché public de limiter la commande à la production nationale ou de proximité. Je crois qu'il serait d'ailleurs dangereux de trop lancer le problème aujourd'hui, on a beaucoup milité et on entend encore parler aujourd'hui pour qu'il y ait à partir si possible de cette année Bruxelles qui intervienne dans le soutien de ce genre d'initiative et je crois que si Bruxelles entend que c'est pour limiter à des productions nationales, je crains que le dossier capote et que quelques années d'investissement ne soient remises en questions. Voilà pour la partie désagréable. La partie plus agréable c'est que, je crois qu'on l'a entendu dans plusieurs interventions, le fruit et le légume, au contraire des autres produits alimentaires n'ont pas de marques. Le lien que l'on doit créer sur l'individu, l'enfant, l'adulte avec le produit c'est le lien au terroir, à la production, aux métiers qui les amènent. L'action, et vous l'avez démontré dans ce vous avez fait les uns et les autres, n'est pas la distribution et la proposition des fruits toutes seules qui suffisent c'est la distribution, son environnement, son lien affectif, le contact avec les opérateurs de production de gros. Il faut le caler là-dessus par ce que sinon on va se tromper de débat.

J REMILLER : on est parfaitement d'accord et je dirais même qu'il faut commencer par ça.

PUBLIC (Bernard PITON, Président d'APRIFEL) : Une dernière intervention sur celle que vous venez de faire sur les prix des produits payés à la production. Je ne suis pas satisfait de voir une fraise partir à 6€ et retrouvée à 22€, je ne suis pas d'ailleurs sûre que ce soit la même, il faut le vérifier mais ce que retiens le consommateur qui entend ça c'est que quelque part il y a un voleur et du coup on

achète plus et il ne se pose pas la même question lorsqu'il achète une voiture, lorsqu'il achète un pot de yaourt ou lorsqu'il achète un autre produit alimentaire parce qu'il y a les mêmes associations de valeur ajoutée mais c'est plus difficile à percevoir. Il faut qu'on y réfléchisse parce que sinon on risque de tous ensemble se tirer une balle dans le pied.

J REMILLER : C'est un sujet que j'ai l'intention d'évoquer dans le cadre de notre groupe. Cela va d'ailleurs être évoqué à l'Assemblée Nationale.

PUBLIC (Jacques COUTURE, Maire Adjoint de La Valette du Var) : La petite ville de la Valette de 22 000 habitants est attachée à l'opération depuis 2005 nous avons donc quelques expériences et quelques résultats. J'ai une question cependant ou en tout cas une interpellation. Ces 55 grammes dont parlait le Docteur Feur me préoccupent sur les ZEP. Je voudrais savoir s'il s'agit des 55 grammes sur le plateau puisqu'il s'agit bien de self service en général ou ce sont les 55 grammes offerts dans le présentoir ? Car on observe en effet que tous les fruits qui sont présentés ne vont pas toujours sur le plateau et cela veut dire qu'il y a quelque part une éducation et un travail très important à réaliser dans les ZEP.

E FEUR : Malheureusement ce sont les 55 grammes offerts.

SESSION 16

FROM INTERVENTIONS TO NATIONAL PROGRAMS – WHAT WORKS?

Chair: **K. Glanz**

- What is known about dissemination of programs for increasing F&V intake? **K Glanz**
- Canteen takeaway - provision of healthy meals in the home by worksite. **GL Hansen**
- More matters targeting fruit and vegetable consumption at sporting events. **G Rebnes**
- Successful national expansion of the Danish worksite fruit program. **R Pederson**

What is known about Dissemination of Programs for Increasing Fruit & Vegetable Intake?

Karen GLANZ

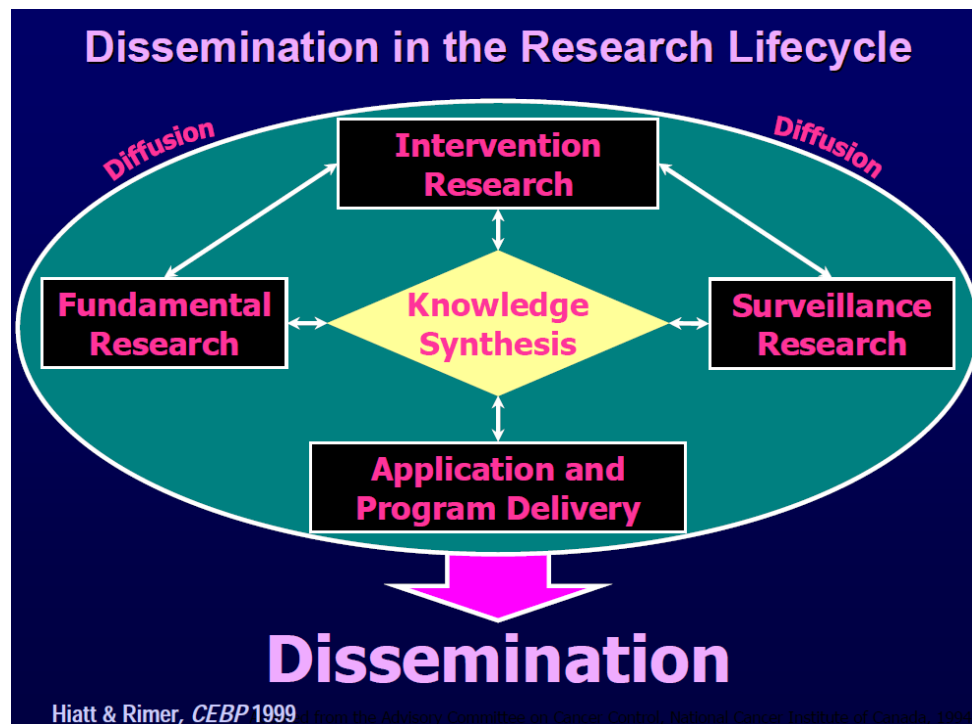
Rollins School of Public Health, Atlanta, USA

We are going to talk about from intervention to national programs what works. I am going to give a bit of an overview for this session and Gitte Laub Hansen is going to talk about the Canteen Takeaway program sponsored by the Danish Cancer Society next we move further north in Norway and Guttorm Rebnes will talk about More Matters, targeting fruit and vegetables consumption of sporting events and Robert Pederson will talk about a successful national expansion event of the Danish Worksite Fruit Program. I will start by giving you a bit of an overview and some examples having to do with dissemination of programs to increase fruit and vegetable intake.

Very briefly, I am going to talk about some aspects of moving from science and control research to dissemination research and how this fits into policies and environments in the community settings. A little bit of evidence review were done about 5, 6 years ago in the States about studies to increase fruit and vegetable intake as a basis. I am going to give you a couple of examples of dissemination that are gone to national level: one the Church-Based program and the other that is not an intervention having to do with measurement system for measuring food environments. And then I will try to recap some key and concrete ideas and I think you will see better illustrated by the talks that will follow.

You heard that a couple of times in different context but basically effective health promotion programs will have little impact if they are not used beyond testing in an initial controlled trial with health partners from the WHO and from industry talking about extending programs further to the national level. So, to improve health what we refer to EBP (Evidence Base Programs) need to be disseminated and we really need real-world examples to learn about exportability and effectiveness in less controlled conditions. There is no one way to make things go national and work but there are a lot of new ideas and key ideas that you can take away.

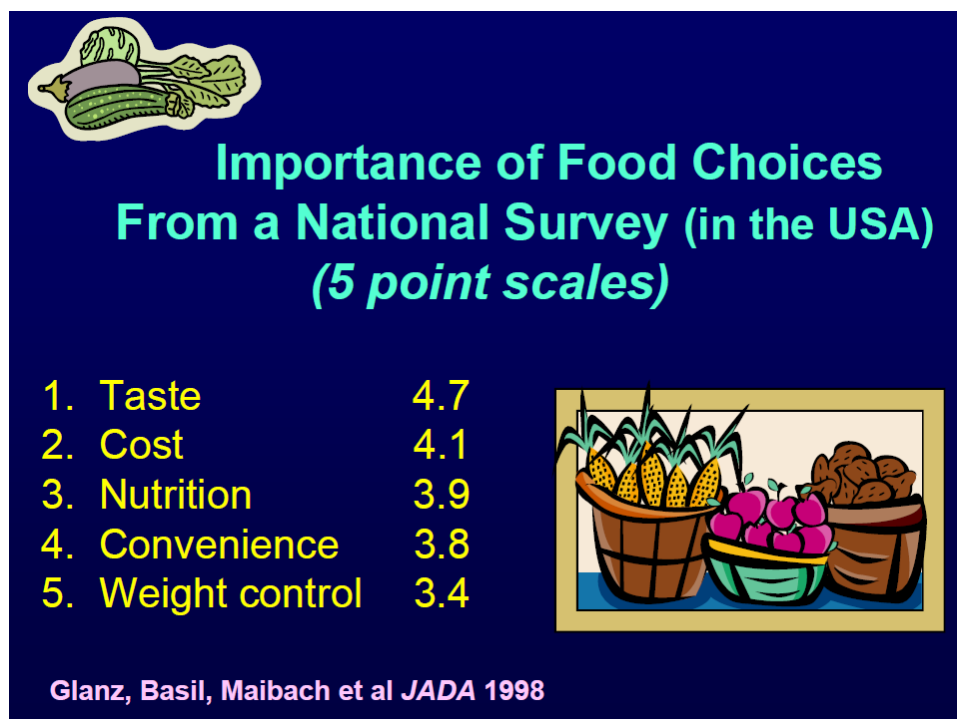
Dissemination is defined as active process through which target groups are made aware of, receive, accept and use information and other interventions such as fruit and vegetable schemes. But most importantly it does not go usually in a straight line; we often see a kind of multi-phase approach where a program is developed and has to do in controlled dimensions and then expanded in study further. It tends to go more in a circle going back and forward.



This image is dissemination model that was adapted by the National Cancer Institute in the United States from some earlier Canadian work. What is interesting about it is that if you put it in a context of this conference, some of the fundamental research that we heard about as from instance from Barbara Rolls when someone was asking questions about how the things that she studied can be put into place and program she said she does not do that and that is for someone else to do, I would say that is for many of us to try to take the ideas she developed and studied about the basic fundamental of behavior and how people eat and turn that into intervention research. There is also place for surveillance research or national epidemiological research that we heard about turning into program delivery.

What are the basics that are behind this? I would like to talk about the types of evidence that play a role in the sources of evidence pathways to diffusion and dissemination and a couple of examples. We often think about evidence and EBP as only evidence that the program works. By this we are usually offering in this context that the program works to change behavior to get people to eat more fruit and vegetables. We are now talking about the evidence based that eating more fruit and vegetables will prevent diseases, that it might be linked to some cancer diseases etc. that is kind of foundational evidence when we talk about evidence of the program

working. But there are really three kinds of evidence to take a program out there: evidence of need, evidence of demand in the audience and evidence of efficacy. In terms of evidence need we all know that people need to eat more fruit and vegetables and if you take obesity in the USA as an example is extremely prevalent and increasing as an article that just came out suggesting that childhood obesity may be levering off but there is no reason to celebrate as even if it does not increase we still are going to be stuck with the problem in many years to come. It is a bit problem it is prevalent and it is costly so just using obesity is pretty to demonstrate the need. For the demand in a lot of our programs they need to be feasible, compatible within the settings that we are working within, acceptable and people need to believe that they can actually be put into place. So many ideas came in the worksite interventions and then the discussions after that in previous session. We heard about fruit and vegetables schemes in schools and some of the challenges that people have faced to try to get those into schools: is it feasible? Is it compatible? What about schools that do not have refrigeration? What about schools that do not have facilities for storage, the supply chain and so for? So acceptability and feasibility may be some variable but we have also seen very good examples that the perception can be improved just by working through some of those problems. We also heard repeatedly in quite a few sessions that what people are actually looking for in their food is not first and foremost nutrition but it is usually first taste dealing with cost issues and nutrition and convenience and weight control a bit lower.



Those results come from a national study did about ten years ago in the USA but there are industry studies and other national surveys that have read over and over again that the terms many people are thinking about choosing food is not first and

foremost health but it tends to be taste and costs at the top with convenience especially for fruit and vegetables. For Efficacy, as I mentioned, we are looking at efficacy to improve health behavior but also cost-effectiveness. How much does it cost to bring about change and what are the costs trade off that are faced? There are a wide of other costs that are under rated and the question is what enough of a change is? We heard about in changes from intervention in schools and worksites changing between the American terms a little less than a half of servings and two more than a half serving, that is really a major change that multiply by the size of population but what we view as professionals as sufficient change may not be the same selling point for schools, worksites or another organization. When we analyzed the studies that have been uttered we really have to look at the methodology, the execution of the trials and how can we interpret things and last and often most neglected is the generalize ability can we said that can be applied more broadly. The sources of EBP go beyond the traditional academic literature. There is one I have to say is that is also beyond what is academic if we trying to go national. First and foremost there are evidence reviews and systematic evidence reviews as the Community Guide to provide services in the US and analysis programs in the UK and in other countries trying to look at their public health interventions and clinical interventions that have been studied and what can we interpret out of those. There are also studies such as Randomized Controlled Trials (RCT) we heard about but also Case Studies and Success Stories which are often equally compelling when it comes to try to get something out the ground. The process is an organic one; it is not that kind of a straight line. In the end I think we do need to keep an eye on evaluation and still keep somewhere in our mind where we making an impact does it make any difference not necessarily in comparison to a randomized control group but in term of public health perspective.

So there are different ways that programs get disseminated and diffused. I think of them in three different ways:

- one is direct to practice where programs are created and people who are out in the fields where involve with them and they went directly to practice;
- another is policy to practice when you think about food assistance programs, school lunch programs regulation women and child situations and so on; policy can actually direct what is going to go on;
- and then the last diffusion research that comes more from academic prospective is really taking a program that was found to be successful in its initial testing and then try to figure out different ways to get it out there and test different ways which often can really increase our changes of carrying on in the future to know how much effort you need to take to get a program disseminated.

In the US state and local health departments were surveying about whether or not they pay attention to EBP that came out a few years ago and pretty much surprisingly evidence is important but is not enough to get things up on the rater screen to get them at the top of the list. It does influence some changes and if people know that there is something that works and they are out in the world of practices

they may be interested in adopting it but there is in particular that need for practical tools and steps to bridge the gap between what works and out to get it out.

To worry about environment and policies, as I mentioned from policy to practice, policy can shape environments can shape school food policies, catering policies, price supports, food assistance policies. But environment often evolve in the absence of specific policies so again it kind of works in a bidirectional way. And, they may have policies that can be not health-promoting at least in the US many members used to follow the joke that ketchup is a vegetable and the school food regulation used to count ketchup as meeting the requirements for vegetables.

About 5, 6 years ago there was an evidence review that was conducted together by the National Cancer Institute (NCI) and the Agency for Health Care Research and Quality (AHRQ) that was completed by a team in Carolina in Research Triangle Institute and they were trying to see as at that day what were the interventions that were available to successfully modify dietary behavior related to cancer risk in that context. The two focus on were dietary fat intake and fruit and vegetable consumption. I am going to talk about only the fruit and vegetable consumption results in particular. The question that they were asking:

1. Is one type of intervention – or combination – more effective than others?
2. Is there evidence of efficacy by population subgroup (ethnicity, sex, etc.)?
3. What is known about cost-effectiveness?

It was an extensive search that went back almost 30 years. They included studies that report fruit and vegetable behavior outcomes for the fruit and vegetable area and they did not include studies where dietary intake was externally controlled such as feeding studies like the kind of studies that Barbara Rolls does will not be included in this and infants, institutionalized and Insulin Dependant Diabetes Mellitus (IDDM) were excluded. So the search yield was 907 articles found and 92 studies were actually retained for the analysis and those include the fat intake studies. They also tried to do some secondary analyses looking at the quantitative analysis and there were other strategies and sub groups strategies that were effective. And 39 studies qualified in the Fruit and Vegetable intake areas some of them with multiple locations but basically what they found was that many of the interventions were successful that the changes in fruits were usually larger than changes in vegetables intake and that the average increase across all studies was just slightly over a half of serving a day. The most successful increases were among children and this falls into the review that Karen Lock talked about in changing behaviors in schools but that obviously include more updated research. Higher-risk groups changed more, when the intervention is spread out across a population of average risk of variable levels of engagement then there is going to be a lower rate of change. And they found that the studies were more favorable active if they were theory-based, not much that we can say about that except that they made it more systematic about following because there is no one particular theory that was found to be the basis for effective programs. Some of the characteristic that were important include goal setting, social support and interaction group type interactions. Interestingly at the time these

studies were reviewed, they were awareness studies that were reported environment change strategies specifically there is a number of issues in interpreting the evidence but it is a good place to start, a good jumping off point that has not been an updated review specifically on these types of interventions. Most included programs that have relatively small reach and so what we are trying to do today are how take some of these ideas of have some of these ideas have been taken and expand it on with new ideas added to it.

When we talk about programs I want to mention particularly that we are talking about specific initiatives that have specific goals whereas the 5-a-day program in the US and other countries tends to be 'umbrella' program. It is not anyone program that has been evaluated or targeted to a particular group. One good example that actually emerges from fruit and vegetable interventions study initiatives by the National Cancer Institute is a project called 'Body & Soul' and this actually an intervention that was combined out of two separated intervention studies. They both found success using slightly different strategies in Black Church settings in the US. It tends to be settings where there is lot of group interactions, a lot of group support they have a culture into themselves and they take advantage of the church setting with things like the sermons and church activities and so on. The National Cancer Institute/American Cancer Society took up some of the key elements of both of these projects, work with church leaders across the country and packaged the program in a way that it could be disseminated nationally and it was then evaluated in another study once it was disseminated to find out if it was still effective and in fact it was. The leaders were Resnicow and Campbell for the two leads on the two different studies. That gives you one example and this program is still continuing, ACS has continued to take it up. It kinds of have a life on its own and it is one of the small number of studies that you can see with that kind of international reach that has progressed in the US.

Another example that I want to use is from my own work and it is not an intervention study but actually a measurement tool that we developed to assess the nutrition environment. This is a research tested measurement tool that was originally developed for research but somehow seems to fill a gap and be very timely and has been used also for community assessment for advocacy and for intervention. I want to give you a very brief idea of what it does and then talk about what happen with it to begin to grow and be spread nationally. Basically NEMS include two different types of measures: one measure is the nutrition environment in stores we started with the focus on confectionery and convenience stores looking at the availability price and quality of the foods available and these are all things telling over and over at this conference as being features associated with more fruit and vegetables intake. Beyond fruit and vegetables in includes categories of foods that are main contributors to fat and calories in the US diet or are aligned with our dietary guidelines.

Core Categories of Foods

Milk	Ground Beef	Baked Goods
Fruits	Hot Dogs	Bread
Vegetables	Frozen Dinners	Baked Chips
	Fruit Juice	

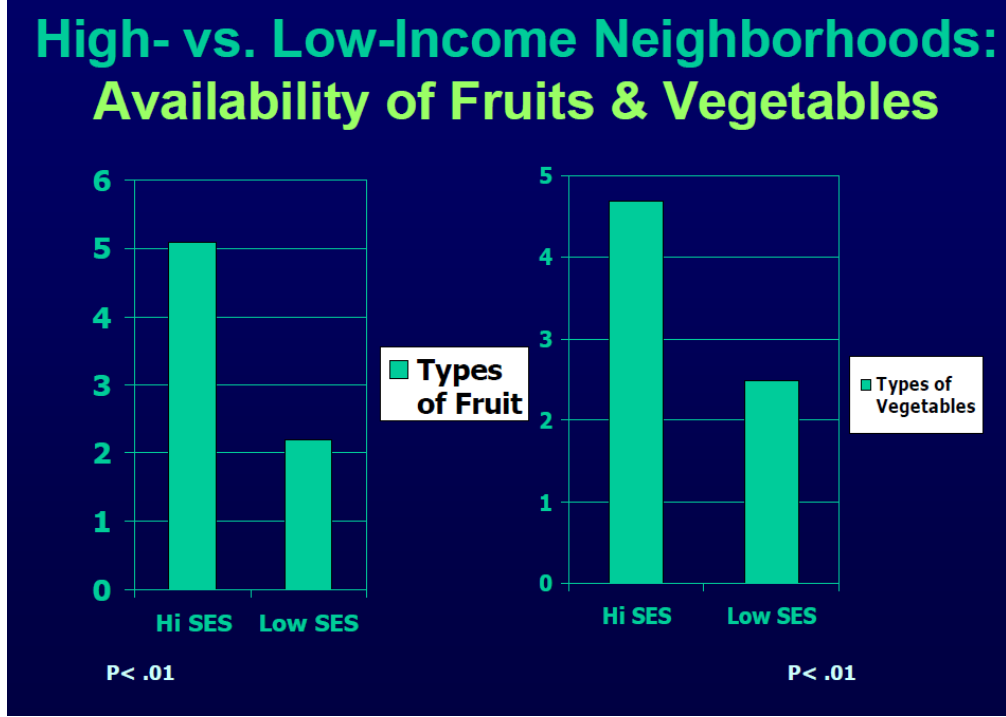
These are the categories of foods that are included. The first thing we did was to look at whether the tool had high Inter-Rater reliability so it could be replicated by different people with a high rate of reliability and we found basically these results shows pretty high rates of reliability across the board.

Inter-Rater Reliability of NEMS Store Observations

Variable/Indicator	Inter-Rater Reliability (2 raters, same day)	
	% agreement	Kappa/V ^a
Any fruit – availability	96.47%	.93
Any vegetables – availability	100%	1.00
Baked chips	96.47%	.92
Lean ground beef	98.82%	.96
100% Whole grain bread	92.94%	.83
Skim/low-fat milk	100%	1.00
Hot dogs (regular vs. fat-free)	100%	1.00
Reduced calorie frozen dinner	100	1.00
Low-fat baked goods	95.29%	.88

^a Cramer's V statistic used when Kappa could not be computed due to asymmetric rater response dimensions

We also designed the measurement study to look at whether we saw differences in high and low socioeconomic neighbourhoods and this is availability of different types of fruits and vegetables in high and low SES in the neighbourhoods.



In the measurement study, as you can see, the tours are distinguished very well between those neighborhoods. We were also comparing the so-called healthier alternative with the regular food and looking at where the cost differences are. (...) We identified out of the food types that we were looking at: the hot dogs, ground beef, chips and juice for really see where you pay the extra price for the healthier choices. With fruit and vegetables we could not compare because fruit and vegetables would be considered healthier food but we did do comparisons between grocery stores and smaller store or convenience stores and again food that you pay a higher price at a smaller store. We also developed measures that were used in restaurants again looking at some of the same type of issues and looking for fruit and vegetables anywhere we can find them, particularly those that were not fried, buttered or served in syrup.

**Nutrition Environments
by Restaurant Type (n=217)**

Variable	Sit-down (n=115)	Fast food (n=102)
Healthy entrée available	20.9%	36.3%
Proportion of entrees that are healthy?	3.2%	8.8%
Healthy main dish salads available	9.6%	24.5%
Fruit available	11.3%	11.9%

Saelens, Glanz et al., NEMS-R, 2007 *Am J Prev Med*

The key findings out of the restaurant measures were that very few restaurants offer healthy entrees, healthy main dish salad available are very limited basis and fruit available on a very limited basis at least in this sample of restaurants that we visited.

So what happened to dissemination tools and methods was first thing that the demand started during the development. We started getting cause and people just heard that we were doing this and we really wanted to be sure that were ready to be disseminated. We have been supported by the RWJF and they gave us further support to disseminate the measures. So we created a 2 to 3 day training program that included a train-the-trainer component for those who wanted to train other people. We do not really know if anyone would come but we thought that is what it takes to really learn how to use an observational measure not the same as a survey. We created CD-Rom for the resources, posted the tolls online for people into the training. We also assumed from the start that people were going to use our measure exactly as we have developed them but they would want to customize them. So we took the lessons that we had learnt developing the tools to try to explain to people how they could go back customizing the tools. Then we started to get cost from state health departments and from the Center for Disease Control and we really did not have the resources to start going traveling around the country with the team and setting up complicated training system but we found the state health department willing to meet us half way to do the planning and support the travel and did the same thing with universities around the country so they gave us quite a leg up. In the last two years we met people in 38 states as well as the District of Columbia, the Netherlands, Canada and Japan which was kind of not what we set up to do but was a surprising spread of this tool.

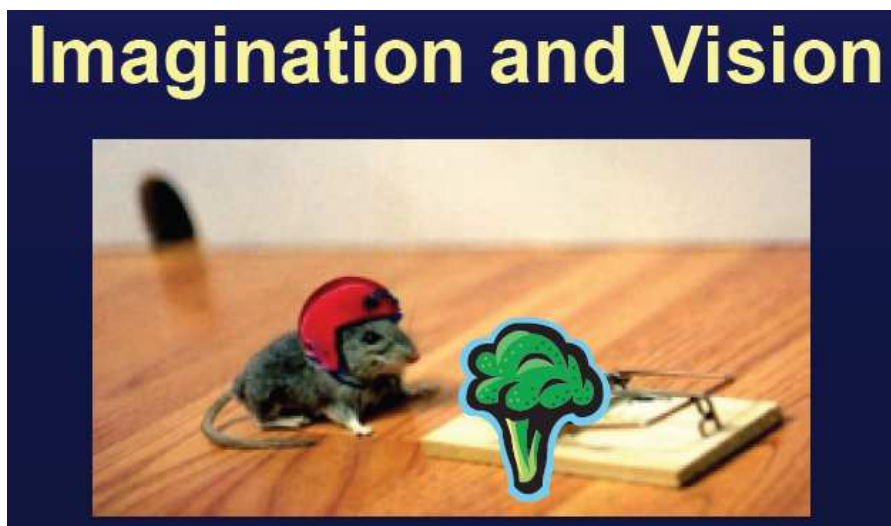
What is next now? We are trying to learn lessons from people who have been trained. We are now in the process of developing an online training program so people do not always have to travel or they can get refresher trainings. A lot of people who have worked with the tool are coming up with new innovations. A group of Pennsylvania is developing a PDA/GPS integrated system that will make it easier to entreat in the field and to link it with other environment data. We have a couple of NIH finding studies in kids and other lessons that we are working with the NEMS tools. Now we are trying to learn more about sampling, how many stores you need to go to, and how many restaurants. What you will be able to see change in somebody's environmental measures if interventions actually change the environment. These are some of the things that we are doing. This is kind of an organic dissemination process; it was not something that we set out to do.

What should we be doing if we do want interventions to go national? This is where the other speakers are going to give you some great examples of what they have done. We should produce for dissemination. We should think that if we are doing something if it worth doing, if it is a great idea somebody else may want to take it and take it to the next step. We should improve and build on prior interventions if

we are adapting from elsewhere, create and infrastructure free dissemination or use existing infrastructure and create partnerships what we hear over and over again in fruit and vegetables.

The potential partners are extensive. They start with industry, governments, universities, voluntary health organizations, voluntary agencies and healthcare until organizations. I really think we should design program for dissemination or package them into toolkits and protocols that can be replicated. Few of us started with toolkits that were for people to use as we are mainly creating programs for ourselves to use.

And my last message is a message for the academic audience as well as those not academics. It is to be willing to give away what we are doing. I think that is a way to contribute to the fields and have a longer shelves life than we develop. And if you do not have time or ability to do it yourself give it to you partners and see if they can not take it the next step. We need to make it easy and results oriented, to use communication media technologies to reach and tailor to users. We also need to keep it mind that we need to keep evaluating process and outcomes of what we do and not just do it because it feels good because we are trying to improve health in a long run. Continuing to be creative is where it goes.



Q&A

PUBLIC (Anna ANDERSON from University of Dundee in Scotland): I am just back from the ISBNPA Conference in Canada and I went to session with Marci Campbell on the research dissemination. I have heard of number of good examples of projects that are started from a research based or from an intervention that have ruled out further. But I can feel like a gap in the structure of research dissemination. I was wondering that if you have a vision of how that gap could be filled in a systematic way that we could learn from.

K GLANZ: I have a vision but I do not have the money. I think it is starting to get a culture shift. Things done never happen as quickly as we thought like. So the academics are beginning to think that there is a way to get things out and there are beginning to be some mechanisms and there are beginning to be some repository for programs and so for. One of the difficult things is that in resources and skills and approaches there has been a tremendous amount done and in some other typical areas in public health like HIV aids interventions and drug uses prevention. There have been contractors that are taking successful programs and then package them and get them out into schools in particular and into community sites. I have not seen that much of that in the nutrition primary disease prevention area. I think that this is going to be a conversion of forces and I also think this is going to be somewhere again but we need to get the examples out. We also need to continue driving tour trying to distil the lessons for people to learn and that is a good model. I do not know if that is a vision but it is a few ideas.

Canteen takeaway - provision of healthy meals in the home by worksite

Gitte Laub HANSEN

Danish Cancer Society, Copenhagen, Denmark

I have been in different positions with the goal of improving dietary habits by increasing the intake of fruit and vegetables in Denmark for many decades. I participated in the meeting in Perpignan, and now I can finally play an active part by giving this presentation of my current work with the canteen take away project.

It is important for the project to improve its scientific value as well as its effectiveness in improving health. If we are successful this study might prove to be a long run funding by the strategic research council of Denmark. This is the first time they have granted this type of project where you mix intervention and implementation phases in an integrated approach. Besides the Danish Cancer Society, three research partners and 12 private and public partners are behind this project.

It is a fact, that the provision of free fruit at the work site has proven very successful and at present more than 40% of the worksite in Denmark has this company fruit. It is very successful and has increased the mean intake dramatically by approximately one portion or 100 gram in the companies with company fruit.

This morning we heard a presentation about on the possibilities of increasing the F&V intake by working with the worksite canteens. The National Food Agency in Denmark has actually launched a campaign to persuade the worksites to implement a local healthy meal policy. In connection with that, the Danish Government has decided, that by the end of 2008 all the public worksites at state-level and all the government canteens should have implemented their own healthy meal policy. The government expects that this initiative will disseminate in to other sectors. They hope that this initiative from state-level will move to regional and municipal level and eventually also to the private companies will follow up.

But what is the next step to increase the F&V intake? What can we possibly do to move on from here? Are we so successful that we can't increase the F&V intake any further? We are looking for a new sustainable solution that will increase the availability of F&V in effective, attractive and convenient way with huge benefits for all involved stakeholders.

A Canteen Take Away program might be the next step in the solution for this increase in F&V. It is defined as the provision of ready-to-heat meals



from the work site canteens for the employees to take home for dinner. The pictures here are from a private company who has been running this Canteen take away concept from more than three years. We know at least 20 work places in Denmark where employees can buy ready to heat meals to bring home and eat with their family. It is the work site canteens that produce and pack and offer these meals once, twice or several times a week. The employees can order their take away meals usually the day before and pay and collect them at the canteen on their way home the next day. The employers only have to heat and eat the take away meals together with their family - saving time for the family to engage in other activities. Often there are no limits to the number of portions you can order, and sometime they use a web shop solution. This sounds so extremely simple so why doesn't everybody get this offer? Why doesn't every worksite have taken away? Well first of all only around 50% of the Danish works sites have a canteen.

We have already identified several incentives why this system has come up but also disincentives why this does not work everywhere. The whole idea behind canteen take away is that it is meant to improve the work-life balance. If you ask the adult population in Denmark what are the main reasons for not eating healthy, it is lack of time. So here we have a way of improving work-life balance. The focus for the Canteen take away concept as it works today is primarily the fact that it is meant to be a convenience for the families, while the health promoting effect, i.e. the nutritional value of the meal and the amount of fruit and vegetables is very secondary. One challenge is to improve the nutritional value of the take away meals.

We actually have measured peoples expectations to the meals served at Danish work site. More than 90% of the employees expect that the meals served at work site canteens is healthy, but alas only 30% (or one third) of the employees perceive the food as healthy. There is a discrepancy here that we are obliged to address.

That is why we have to work both on the training of canteen personnel and the employees' perception of healthy foods, which is not always in concordance with the nutritional guidelines. Along side we have found, that the willingness to pay for the fruit and vegetables is low compared to meat. This issue was also addressed in the plenary sessions. This is another research focus we have in this project, which I will return to.

Qualitative research support that the canteens personnel are convinced that they produce healthy meals, while often they are in fact not, as we know from nutritional analysis of the meals. This is a challenge to this canteen take away project. If I make people take home unhealthy food that would counteract the purpose of the project. This is the reason I have to work on improving the nutritional quality by offering training, tools and dietary guidelines for the canteen personnel and education of the employees on healthy eating.

To ensure the nutritional quality of the take away we want to develop a self-evaluation tool for the canteen personnel. The tool shall assist canteens in evaluating the nutritional value in an easy-way. The majority of the canteen personnel have neither the necessary training nor the time to do nutritional calculation.

We want to measure the effect of implementing the canteen take away on the nutritional quality of the diet of the employees. We want to test the willingness to pay for healthy concept and we want to know what are the cost benefits of this canteen take away. We hope to deliver both evidence of the health effect of canteen take away and to develop effective tools for implementation, offer training by enabling the process of implementation stepwise and as we notice the need. This integrated approach is why this project, has a bit different design than the traditional intervention project.

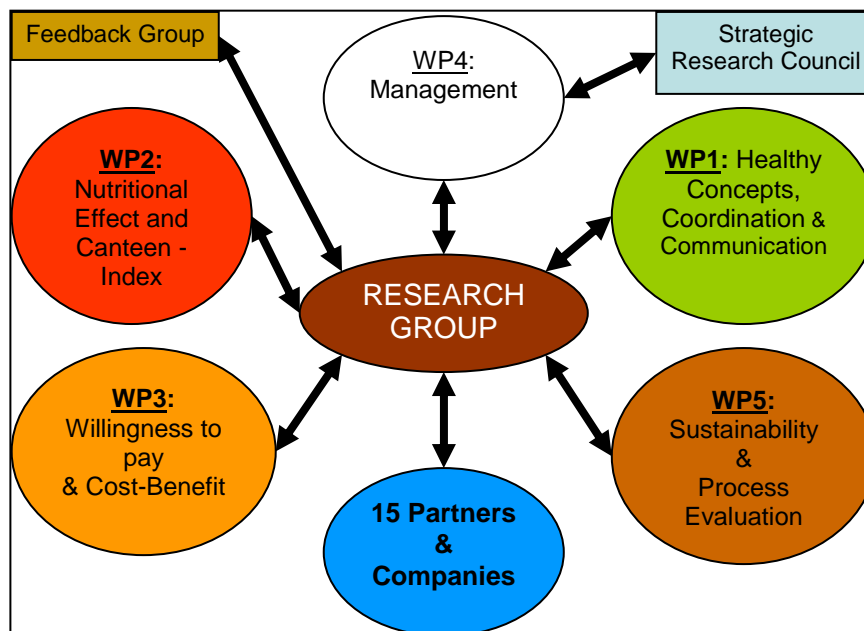
Some of the enabling factors to more canteen take away have been identified. As you probably know, the Danish women have the highest participation rates compared to most countries in the world. 72% of the women and 78% of the men join the workforce. We still have seen an increase in the participation rates among women and still we lack qualified workers in Denmark. Thus it is very important for the companies to attract and recruit the right employees. This is yet another enabling factor for more canteen take away in addition to the health promotion trend at the worksite.

Some of the disincentives for canteen take away, are that many people prefer home cook meals and they fear loosing more cooking skills. What I usually argue, is that we have lost them long ago, so I am confident, that the canteen take away will not do any harm there. On the contrary canteen take away, can inspire the families to new ways of preparing new fruits and vegetables. A large group of Danes have mistrust to ready to heat meals from the food industry. This is partly because of very underdeveloped market for ready to heat meals in Denmark, compared to for instance France and in the US. Here you can find large diversity in price and quality.

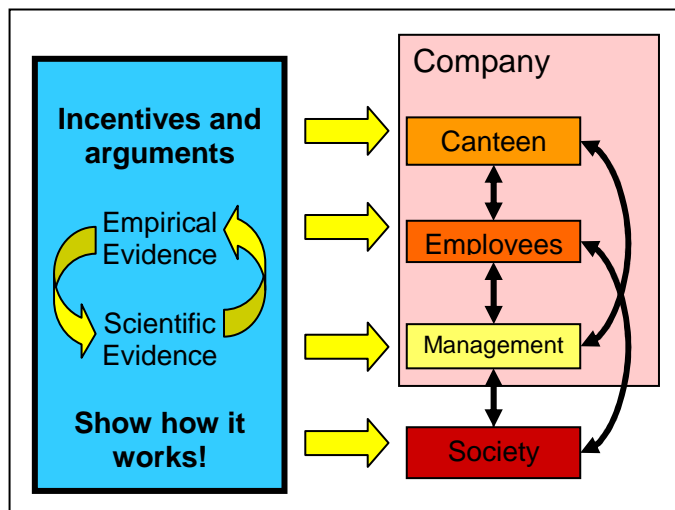
Counteracting more canteen take away is also the fact that 40% of Danes eat their main meal at work and this makes them more reluctant to buy yet another meal as take away because they prefer a lighter meal for dinner. More barriers for canteen take away is, as I mentioned earlier, the fact that not all the canteen produce healthy foods, the canteens may not have the right personnel, or the right equipment or economical background to produce canteen take away. Large diversities among the employers can make it difficult to offer a canteen concept that will please everybody.

There is not just one concept that fits all companies, so I have to deal with the facts that I can't just develop one concept, I will have to describe a range of different concepts.

The goal of my project is to ensure the social acceptability of canteen take away. I want to increase the amount of F&V in the meals in the canteen take away and also improve the willingness to pay for this canteen take away. I have to develop the market and support the canteens when they want to implement the healthy take away. And also I want to frontload the incentives for the society and for company. We want to study cost benefit and find out how we can support the companies in their decision process. Last goal is to ensure the supportive environment. There is tax and food legislation in Denmark which could have impact on whether the canteen take away is going to be implemented or not. If the regulation doesn't support the ideas, the companies or the canteen are less willing to implement canteen take away. Thus lobbying is also a part of my job.



This is a brief outline of the organization of the project and I am happily not alone on this project. It is divided in 5 work packages (WP). B Mikkelsen is working on the sustainability and process evaluation WP5. I am in charge of WP1, I am working in developing in the concept, coordination and communication, I have a website and I am developing a different tools. From the National Food Institute they have to evaluate the nutritional effect of canteen take away and develop the canteen-index which is self evaluation tool that could help the canteen personnel to find out whether they are serving healthy meals WP2. We also worked with the Institute of Food Economics at the Copenhagen University. They have done some willingness to pay surveys and the cost benefits analysis that I am going to tell about later WP3.



In this slide is an outline of the approach of this project. The blue box is the work of the researchers and the company and all the stakeholders are working together and forming both the empirical - we want to show what makes it work - and the scientific evidence. We make an effort to frontload incentives and arguments to all the stakeholders at the different levels – the yellow arrows. There are of

course the companies and within the companies we have the canteen personnel, the employees, the management level and also societal level we have to work out the arguments and incentives to canteen take away.

What we are trying to do is to analyze the stakeholder's incentives and develop healthy canteen take away concepts. We enable worksite canteens to develop their own concept by giving selected canteens managers the opportunity to join workshop. This is a process where I give them ideas and they tell me whether they work or not.

We gather information from the 20 companies which have already some experience in operating different canteen take away concepts. We try to involve partners; beside the research partners we have governmental institutions, we have labor unions and we have private companies, which are willing to try out canteen take away and let us test and research and intervene in their worksite and find out whether it works or not. They support the project by bringing in a lot of empirical evidence and testing ground to build the scientific evidence so we can study the effects of this intervention and the implementation of canteen take away.

What are the employees' incentives? There are of course barriers because they dream of home cook meals and we know that using canteen take away or fast-food induces bad consciousness and the fear of empty refrigerators. We evaluate whether the employees want to pay for the added value of canteen take away meals. Furthermore we have to deal with the fact, that consumers have a general mistrust in the food industry. Canteen take away might have an advantage over industry in people's perception. Because here the employees know the personnel in the canteens, so they are more willing to buy the food from the canteen. One of the key question is how can we measure the success of canteen take away?

We measure the success by the willingness to pay and how often the employees chose to buy the canteen take away. For this purpose, Jonas Nordström at the

Institute of Food and Resource Economics at the University of Copenhagen, have invited 10.000 people to participate in a web-based survey. The response rate was approximately 50%. In this survey they were asked how much they were willing to pay for a healthy canteen take away-meal.



As you can see, people are willing to pay is between 3 and 7.5€ and we know from the experience that the normal concept with cost is at least 6€, dependent on the actual concept. So there might be an economical gap here. People are a little reluctant to pay the full price; they only want to pay for the food not the cooking. Is it possible to implement canteen take away if people do not want to pay for it? What can be done about this? We try to find out, what could be the incentives of the worksite. Could it be that the incentives for the worksite are so big, that they want to pay for the difference between the production price and the willingness to pay from the employees?

The incentive of the worksite is of course, that this new benefit can increase the productivity and it could help the company to recruit the right personnel and its kind of social branding (Corporate Social Responsibility) with. It is in the interest of the companies that the work life balance of their employees is okay, so they are satisfied with their work place and thus less sick. It is also seen as a benefit for the employees and it could be a worksite health promotion initiative at home.

We wanted to find out the calculated economic benefits from canteen take away. This was done by Jørgen Dejgaard Jensen, another research partner in this project, from the Institute of Food and Resource Economics at the University of Copenhagen. These results are very preliminary like those from Jonas Nordström and not yet published.

Given that canteen take away is offered once a week, and if it hereby could reduce the number of days away from work (sick leave) by a quarter of a day which amounts up to 1.85 hours a year. At an average wage rate at 34€ per hour for a Danish worker, you could saved 63€ per year per employee.

On top of this you could maybe have a productivity gain or flexibility gain. Given that canteen is offered once a week and it will increase the mean productivity of 5 minutes every week, you could gain more than 100€ per year per employee. The return on investment when you add these two amounts is 4€ per portion of canteen take away meal that the canteen can sell.

If you take into account that people were not willing to pay for the full price for the production of canteen take, actually there is room for the companies to use some of the return on investments from canteen take away. That could be one way of making a success out of the companies wanting offer canteen take away. In addition there could be other benefits which can not easily be measured. What if we can make it financially feasible this canteen take away? Is it enough to make it a success?

To maybe answer that, we have to look at the next level which is the incentives of the canteens, the personnel, and the canteen manager. There could be a demand from the employees or HR department, and there could be threats of being overtaken by canteen operators and they could be a pressure of being more efficient or for the canteens to play a more innovative part of innovative companies. There could be wishes of change in production and offers and the canteens could want to improve their image. This is some of the incentives for the canteens to engage in canteen take away.

But what will happen if the canteens can not make canteen take away work? You could risk ending up with a concept of poor eating quality, low nutritional value and high price. That is why I am going to help them making it work by developing tools and disseminate experience from canteens which have succeeded. We are planning to have canteen – index and we are planning to develop other tools for decision making and implementation with the Danish Cancer Society.

Now we look at the incentives for society and policy development. The argument is that if you succeed and get a healthier and more flexible workforce that are more satisfied with life and work you get more stable labor market and decreased in public costs. Jørgen Dejgaard Jensen again has tried to measure and calculate the possible health effects of one weekly canteen take away meal and has tried to use 3 references: the mean intake of F&V at supper and from home cook meals and from fast-food meals.

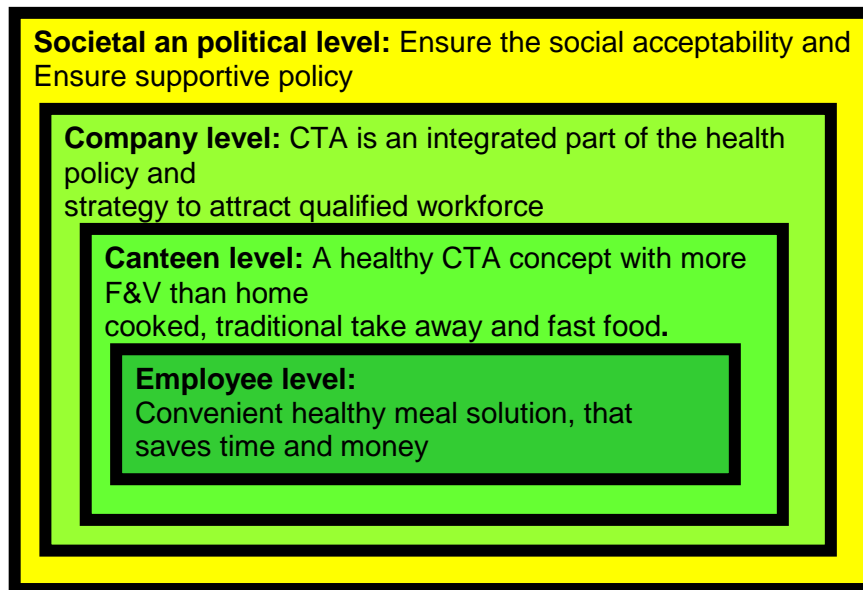
Health effects (on cancer and CHD) of one weekly CTA meal with 200 g of F&V compared to 3 different references	Mean intake at supper	Mean intake from cooked meals	Fast homefood meals
F&V in reference supper (g/portion)	108	150	50
Mean net effect on F&V intake (g/day)	13	7	21
Mean F&V intake – without CTA (g/day)	429	471	371
Mean F&V intake – with CTA (g/day)	442	478	392
Increase in share of people over 600 g/day	1.8%	1.1%	2.4%
D DALY's per 100.000 inhabitant	7.9	4.9	10.4
D DALY's in Denmark	263 - 559		

As we can see the change in Disability Adjusted Life Year (DALY) is very minor to what effect you actually could want. He also calculated what you could gain given this canteen take away and this is not very big.

So what can make it work at policy level, at societal level? This could be a favourable tax policy and I am actually lobbying trying to ensure the current low tax on canteen meals. I am not sure I have been successful but, this could be a major obstacle for this canteen take away program going national. We also have unfavourable food legislation that could make it very difficult for canteens to comply with regulations.

The preliminary conclusion is that the willingness to pay is low among employees but the calculated direct economic benefits for the company are fair. The calculated benefits for society are relatively low compared to other initiatives, but there are added values that are not easily measured.

We have a long way to go before canteens only serve healthy food or meals. If I should point out what should be a framework for a national program is that you have for the time being the empirical evidence - this is still the strongest in this study - but we are hoping time to produce scientific evidence in the research work packages. When you are dealing with worksite health promotion is important to strengthen the motivation and frontload the incentives to overcome the barriers and incentives at all levels.



Last but not least I want to give you three recommendations.

1. When you want to go from intervention to national program you have to have an integrated approach and you have to involve stakeholders at all levels from the very beginning in trying to develop innovative convenient easy to apply financially sustainable solutions.
2. You have to move on stepwise by starting with a pilot study like mine for instance and move on to a small scale intervention to test the effectiveness of your solutions before you eventually move on to the large scale intervention or national program.
3. And third to be taken very seriously you have to be very patient and have to work on a long term funding.

Q&A

K GLANZ: I was wondering if the canteens are interested in changing the foods they serve on the worksite such as the lunch meal as part of this.

GL HANSEN: Yes. It is often the way everything starts. The human resource management board contacts me and says there is something wrong about the canteen meals, they want to change it. And by the way if we could get CTA in the same run that would be a good idea. They can see a good incentive in trying to change the food but it is difficult because they believe they are doing a good job so there is a challenge here.

More Matters Targeting fruit and vegetable consumption at sporting events

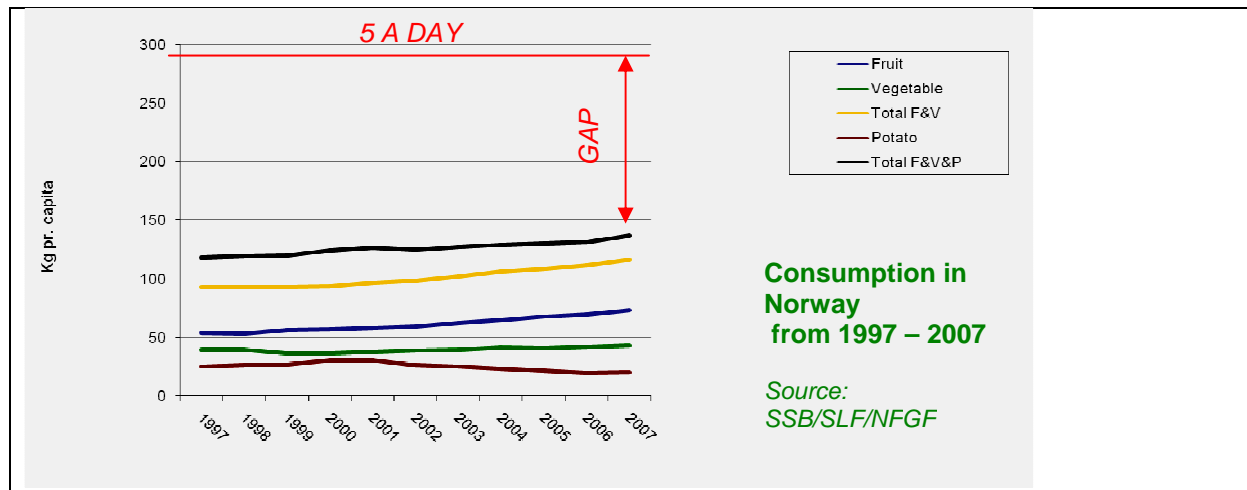
Guttorm REBNES

Norwegian Fruit and Vegetables Marketing Board, Oslo, Norway

At the Norwegian F&V Marketing Board we are a private association and that includes it is own by all the importers and wholesalers and also the wholesalers own at 100% by supermarkets in Norway and that is very important to remember how we actually link this to the industry. Basically, everyones linked to the fresh F&V business in Norway are our owners so all the competitors. We are a private foundation by we are supported financially by the Norwegian Government, the Ministry of Agriculture and Food and the Ministry of Health and Care Services which is the Fruit School Scheme. Our goal is to support the industry, throughout the value chain, to increase the total consumption of F&V in Norway. About the background we target in our strategy to fulfil our goal three main barriers for increased consumption: inspiration, knowledge and availability. There are many who target the same barrier but our approach is to inspire through PR and editorial articles in newspapers and magazines and we are very successful on this. We have to find ourselves as a content provider for the press and we measure this every day really to get through press references. On the School Fruit Scheme for instance last year we had 586 articles in the press. Increase availability is also very important as the work we have with the supermarkets. But we are going to talk about children and our two programs there are the School Fruit Scheme and the MER program. The MER program is different programs but I am going to talk about the one linked to sports.

The consumption in Norway related to the average in Europe, we are quite low. But in northern Europe and in Norway either Denmark it is increasing a lot. In average, the last 10 years we have had an increase of 3% every year. But, from 2006 to 2007 we had an increase of 6% and that was in volume. The increase in value was 10%.

That is quite exiting to look at which products do actually increase because price is ranked as number 4 or 5. It is freshness and value of the products. It is not carrots that cost a dollar a kilo it is the carrot that we pay \$10 a kilo. It is the very expensive tomatoes. Of course, we are a rich country but we have willingness to pay for good products. However the growth is not enough to reach the target of five units a day, there is a big gap. So we have some work to do kids eat even less.



Kids and young people are hard to reach and in Norway there has hardly been any communication toward children and teenagers for F&V. It is a huge task. So where should we start?

My organisation is very action oriented so we wanted to get quick results toward organised sports. Many children are linked to organised sports in Norway. To give you some background, remember we are 4.7 million inhabitants in Norway, it is just a big city in Europe but 2 million of us are linked to organised sports and 1 million of those are under the age of 24. We have more than 13 000 sports clubs and then thousands of sports events. This makes a great territory for F&V.



However, as the newspaper say in Norwegian “healthy sports but unhealthy food”. It was a big section in the biggest newspaper in Norway 2 years ago. The only food they found at sports events where children participate were hot-dogs, soft drinks, sweet, junk food. We did a survey where we interviewed sport association and clubs and that revealed that only 5 % offered

F&V for sale at their events but 80% would like to do it.

So to make a long story short we made the concept of what is called MER. We wanted to code it a little bit not to make it too obvious because we know how to communicate to children so it might be to be perceived as “cool”. MER (or MORE) is large-scale awareness campaign that targets children and teenagers. Its main objective is to increase the availability of appetizing, ready-to-eat fruit and vegetables at sporting events and sports facilities. We focus on sporting events where children participate so we do not work when the national football league have their big matches. In other works, we help clubs to organise how to sell pre-cut tempting fruit and how to make money of it. The MER model is based on how to help sports club to

make high profitability, how to make it easy to implement, trendy and tempting, how it should be positive image around it and very important it should be easy to get volunteers and easy to motivate them and that are the parents and the kids themselves. The MER model helps the clubs to make repeat sales. They can try it once and that was our fear as well that they do it once but that was fun because when the clubs did it once, the parents shout if they try to leave it out next time. Also, very important, the MER model makes it possible to communicate the results to the society and to the government, to newspapers etc. so it is a very positive umbrella. It is not difficult to sell pre-cut fruits, it is easy but it is difficult to make money out of it and it might be difficult also to get it to become a system that survives for a long-term because parents tend to quit when their kids quit the football team, they leave. We branded MER. It is registered Trade Mark so no one can take it from us. Just for fun curiosity MER in Sweden is actually branded as a soft drink but just work in a region market and it is branded by Coca Cola.

One thing we have in our head is that MER should be pre-cut fruit because we know that when we cut up the fruits and make it every day snacks the kids will double their consumption and that is very important to remember.



How does MER work? The clubs purchase fruit from wholesalers or stores we do not intervene where they buy it from. The clubs pre-cut the fruit themselves, fill it into containers through voluntary work. In profit, they sell it USD2.50 so their profit will be USD1.50-2 for each box so it is good incomes for the clubs. Sports clubs that want to put MER on the menu must sign a letter of intent so they write a contract with us, after which they will become MER representatives and receive a toolbox that makes it easy to them to get started selling pre-cut fruit and vegetables. This is organised through our website and it is also interconnected with the website for the different sport federation e.g. the football federation, the basketball federation because they communicate 100% via the web to their clubs. That is also very efficient. I have one person at my office organising everything. Just to tell you, up to now we sold 1 million plastic containers.



This is what the toolbox looks like. We give them knives, cuttings boards, apple cutter, instruction manuals and videos, aprons, we also have an e-learning system where they can just access it through the web, profiling materials, plastic gloves as we focus on the hygiene and we work with the government also the authorities to tell them how they should do this the right way and we also support them with plastic containers in the beginning then the wholesalers take over and they actually have to buy it. This is support through our website www.frukt.no/mer. They also encourage putting in reports to see how it goes and to upload pictures.

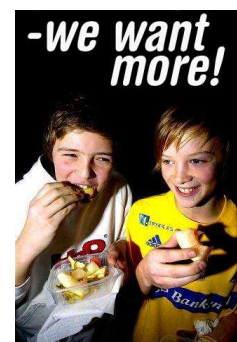
Results: By May 2008 we had signed up 29 sport federations to promote the MER Campaign that is the football, basketball, and swimming, basically everyone. There is

1300 sport clubs up to now that have signed up for the MER project and re-used the concept over and over again. As I told you, we sold more than 1 million containers and we had 900 positive reports on our website. You can then see the entire statistic at all time, this connect them to companies that help to send out the boxes, it is all automatic. We do not do any sponsorship as a rule we focus on sporting event where children participate and we use all our money in US dollars we use about \$400 000 each year and we use it basically on the toolkits. We do not do any sponsorship but we support some events like the Swatch Beach Volleyball Tour 2008 which is in Gstaad, Switzerland this year but we do not pay to get our logos on the spot field event if they will put it there anyway but we help them on how to organise the MER kiosk, how they can make profit out of selling pre-cut fruits. How this is done? They contact local Volleyball team that organise all the practical things around it. We also have a tour in Norway for kids, the Cycling tour. For 3 weeks in summer 2008, cycling clubs all around Norway, participate and have their small cycling championships everyday for 3 weeks and they will sell pre-cut fruits in the kiosks as well. The key success criterion is to keep it simple. We found out that one of the most important success criteria is that we keep it simple. It is tempting to include a lot but the all idea with the MER concept is that we wanted to make the best possible use of the positive commitment from parents, coaches and from the young people themselves. It should be easy to understand, easy to set up, easy to run and it should be easy to make profit out of it and that is very important because that is what most motivate the clubs to do it. It is not difficult and that is probably why it has been so successful. We have been running this now for 4 years and I believe some of you have heard it before so we continue.

We also have some important ambassadors: the President of the Norwegian Confederation of Sports and Norwegian Olympic Committee and the Minister of Health and Care Services. Also perhaps important ambassadors are those 29 sport federations and their general secretaries.

Evaluation: it is well received, good instruction materials, popular among players, coaches and spectators send positive signals about the club and the individual sport and it is perceived as very modern and trendy. It is a good source of income for the club and that is always a struggle if you get linked to sport clubs to get incomes and it is enjoyable volunteer work, it is positive all around it. It is constructive to encourage children to eat less sugar and promotes positive long-term changes in eating habits. It is easy to get information about it through a place you also can go in that is the website and see how we do it even if it in our region and get a sort of idea. We see that the kits are used and re-used even if some takes the knife they get the idea and the supplement what miss. The MER logo gives the campaign a positive profile.

The media have also been very positive. The MER campaign has caught the attention of the Norwegian media which is generally more concerned by what we eat and how we can eat healthier than we use to. Now we experience the great interest and enthusiasm for



the MER message and we see that both local and national newspapers, television and radio channels want to follow how it goes.

The Kids love it! The love the MER project and it is a good project that has shaped the consumer for tomorrow.



MER videoclip

The MER-campaign is a well tested tool for organisations that seek to offer “ready-to-eat” fruit and vegetables at their arena.

Why slice the fruit? More appealing, higher consumption, easier to sell, money in the box

Sliced fruit in tubs is easier to sell.

Get started! The MER- campaign offers all sports clubs free “tools” and guidance, making it easy for you to get started.

Sylvia Brustad, Minister of Health: *“Our people health needs team work and to do that we need to start with the youngest so there is only good things to say about this campaign”*

Espen Larsen, General Secretary of Norway’s Badminton Association: *“Several of our clubs are already part of this campaign and we recommend that all clubs take part.”*

Tove Paule, President of Norway’s Athletes Association: *“Overweight, obesity and type-2 diabetes are rapidly increasing in Norway and we a great responsibility towards our children. This is something we participate 100% in. All clubs are arranging sports events that contact the specific unions or directly contact the information to take part. This is great.”*

Eat MER fruit and vegetables

To conclude, MER works. It is easy to implements and easy to run and it makes us see great results and it is profitable. It creates habits and it actually just positive! I totally agree with the fact that we should share so take it to your country and I promise you that you will get some very positive results. Good luck!

Q&A

PUBLIC (Jane HAKINS from Australia): In terms of supporting clubs where they already have a canteen there trying to sell food, has that have an impact on their sales? Are they supported with the program?

G REBNES: No. Basically, very few clubs have their own canteens but the problems at some places is that if you have a big sport all you might have some professional players. They sometimes disagree but this is basically not our problem, they found a way around it.

Successful national expansion of the Danish Worksite Fruit Program

Robert PEDERSON

Danish Cancer Society / 6 A Day , Copenhagen – Denmark

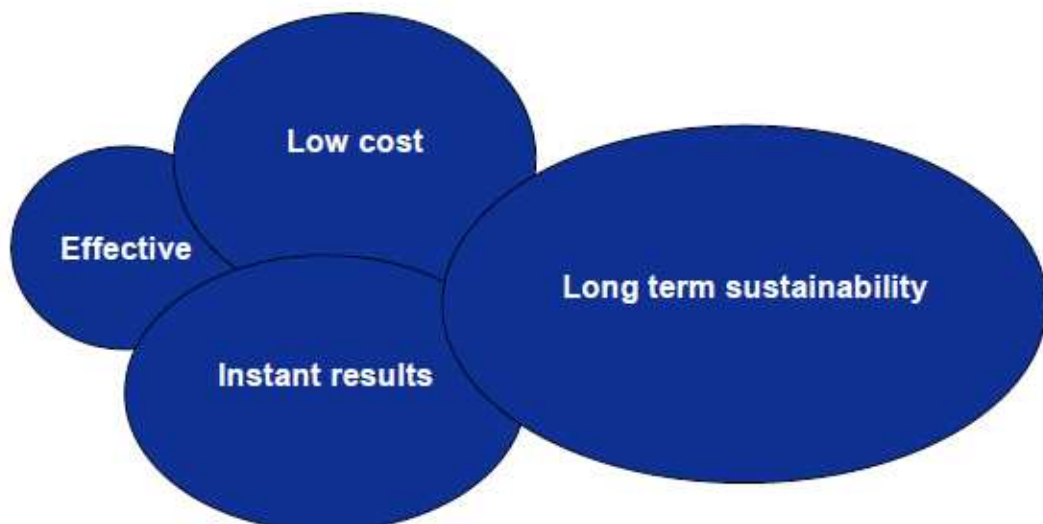
I am going to talk about utilising partnerships and multiple motives out of our experiences of informing projects and this some kinds of example of different projects.

The rumour was when we did this project that it was a project that ruled itself out, we did not have to do a lot that is the rumour. We did some work, we did some very strategic work and some of those are a bit influenced, some of those we figured out on the way but I think it is important to look at the experience that intervention program moving them to international programs and see what works.

(...) I just want to give an example of effective interventions and very briefly tell about the Danish Worksite Fruit Program involves, talk about our epidemic results, how we used dynamic partnerships multiple motives in our work and then just spend more time on the key success factors. I had the chance to kind of look at that in a different perspective and analyse the key success factors. Most of you know I work primarily with School Fruit Schemes but there are some similarities and some differences and it makes an interest in perspective.

For the successful work site interventions there is a review done a while ago part of the WHO on the F&V global initiative.

Ideal intervention



My ideal intervention should be effective and I will measure effectiveness in a lot of different ways. We talked about the impact of Public Health but we have to look at a lot of different types of impact. We want instant results when we do with policy

makers, whether we are dealing with people who will have to pay for these programs we need to show them instant results and this is not always that easy. They need to be low cost or at zero cost whatsoever. And they have to have long term sustainability because if we do not have long term sustainability then we would not make any real change. I would like to pick up on something that often we are pretty good at showing interventions that work in terms of raising F&V intake but we are not very good at what is get them ruled out the dash evidence impact on public health. So we really need to start looking at the science implementation. How do we get these things moved out?

In terms of food policy distribution a work site fruit program is an alternative food change. What we are trying to do is to make free and easy access at work to F&V. Sometimes it works in canteens or sometimes it is a basket but what we want to do is make sure that it is accessible. It is not enough to have it at the canteen you have to have it where the people are working.



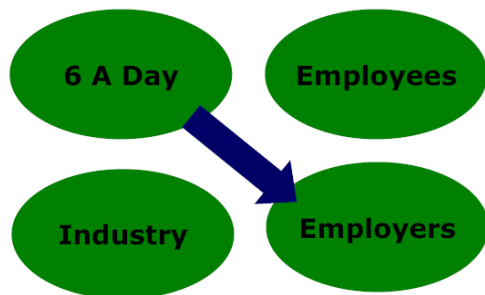
What we are looking at is multiple sites, putting it right where the people work so that they can eat it. We are trying to do it throughout the entire day while working, during breaks and at meetings. I get back for the meetings because it is what we are looking at as a promotional on the work site fruit program.

There are original challenges. We were concerned that will the adults eat the fruits? We knew that children would but would the adults eat it, would the workers eat it? How to change social norms and make the cost legitimate for employers? And I guess the question we always ask is who is going to pay for this? Who will pay? We have been asking it for a long time with our School fruit and who is going to pay the bill? We are trying to look at the motives. What are the motives? Who are the stakeholders? What are their motives for doing this? The employees, they love it. That was pretty easy, we did kind of a users survey and when the big drivers were actually a sign that employees perceived it as a sign of employer appreciation (97%), 95% thought it was delicious, 86% said it was healthy, only 51% said it was because it was free and 47% said to eat less candy. Worksite in Denmark does a tradition for eating confectionery products as a snack.

In the industry they are of course looking for business opportunities. They love to sell it, they make a profit, it is access to a new market and what we saw was a lot of SMEs specialised in worksite fruit distribution. So it has been a dynamic market and

this is one of the key factors and this is why we say it ruled itself out because there was a strong industry perspective. They were making money while doing this. A lot of companies are internet based.

So what we have is 4 happy partners, what an ideal situation with the 6 A DAY program.



This is one of our original interventions; the other ones were the Canteen Program that we went through earlier. So we have 4 happy partners and the program ruled itself up but what we needed to do was to convince the employers that this was worth. This was the

kind of strategic area that 6 A DAY and the Cancer Society and the health partners took in this program. Our role of health partners was to target employers asking them what they think may work because we are in unlucky situation. When we started this program we actually had companies calling us saying “when are you going to start working on this program? We need some help here! What are you going to help us with?” So what we did was to tell them that were doing an evaluation intake and satisfaction and we help you with the PR because sometimes the health organisations have a different role. We can give the stamp for approval from the health sector. The 6 A DAY program is probably one of our most successful interventions in terms that it also happened very quickly and I hate to say that but the industry does not do all the work but they do a fair share of the work. And why do they do the work, because it is profitable fund.

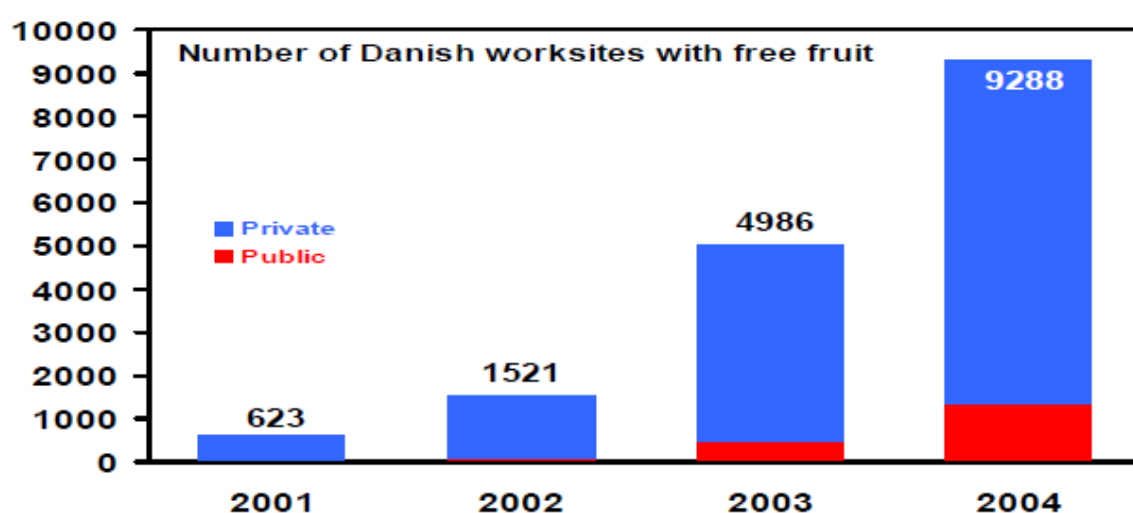
We talked about impact assessments and I would say I think impact assessments and how they impact on F&V intake are important but there are important for mechanizing the program. The other one was that if you are spending public money then you have to show that they work. There are a lot of different ways to show that things work and in this program we are not spending a lot of public money. But we did do a dietary survey. What we are looking at is that we have done a lot of work with changing everyday structures working towards environmental change and I think what we look at is using environmental change that we can achieve change in diets in a lot more effective way than especially traditional health education methods. You get change attitudes and values for free by bringing the food in. You are in this process of attitudes changing. The other thing we noticed from this program was that word of mouth is probably the best advertising you can get. People were saying “we have a work site fruit program in our place do you have one? No I don’t, how do we do it?” This was our main form of advertising.

To tell a little bit about the results we have basically a 0.7 portion increase and this was not a randomised case control trial; it was a case control trial. We did use a control group to make sure that we were just measuring our society effects. One of the other thing is we showed a substantial decrease in what men were eating in sorts

of snacks and confectionery products. We did not observe this difference when looking at women. 96% make use of the offer daily or almost daily, 80% think that the money could not be spent better so they were very pleased that their employers were investing in this program. 85% would miss the fruit a lot if the program stopped and this is something that when you get the program in and then they take it away then employers are going to say "you can't do that!" So it is kind of these unstoppable projects.

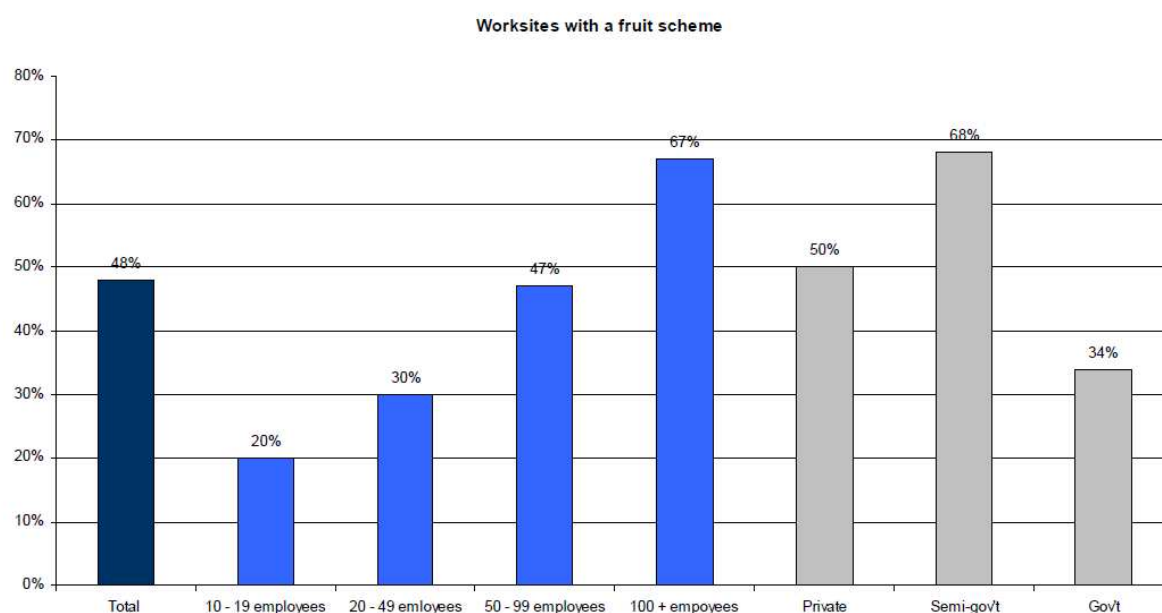
Why should employers pay? We started seeing if we could show when we implemented the Fruit Scheme a difference in sick leaves.(...) I am not a scientist but my understanding of it to show differences in sick leaves you have to have number one a lot more massive intervention than this one. There are other social changes going on that would make it very difficult to show in this change and the sample would have to be probably a lot bigger than what we are used to be working with. What we did was basically to compare price of the Fruit Program to the costs of one day of sick leave and the employers can see this and it is cheap compared to a lot of other benefits especially cheap compared to providing free coffee which is one of the other benefits. They used it to attract and hold qualified staff. This is a kind of front runner project with a lot of information, technology, financial sector, banks, ... and I will show you how this is kind of spread. It is also a sign of appreciation and it also helps the company to create a trendy image. The further arguments are that balanced diet could lead to increase productivity. It is a healthy alternative to cigarettes which are not healthy at all, cake candy and coffee and cheaper than running a canteen and I think that is why it has been very popular in a relative small scale because a lot of employers do not have the money to run a canteen and the facility so it is an alternative to a full scale canteen operation.

These are the results:



Basically, this shows when we started in 2001 the number of worksites and as you can see is that the increase is quite impressive. The other thing we noticed was the difference between private sector and public sector. After 3 years we are reaching 9% of the workforce and it is still growing. We have done some interesting telephone

surveys. One of the ones we do also measured the effect of the 6 A DAY and is called the TRANBERG survey and it showed that 32% and 33% of the Danish workforce were reached by the program respectively in 2006 and 2007.



It is still growing. This is a National Health Administration survey on health promotion at work sites. What we are seeing is that there are about 48% of all Danish worksites that have a Fruit Scheme Program. You can see the differences between the sizes and also between the privates, semi government and government. What I am really happy to see is that it looks like the semi government and government sectors are growing because what I was worrying about when we do these kinds of front runner projects is that it trickles down to the rest. So I am very pleased to see this development. We have hear a lot of talk about social marketing and something adapted from WHO's framework for promoting F&V is the 4 A's: Availability, Accessibility, Affordability, Acceptability and I will put an S of Sustainability of interventions. This relates to the 4 P's Price Product Place Promotion and this is an important factor to work in the interventions towards large scale programs.

The key success factors, effects studies measuring the impact of F&V consumption and this project anyway was important for public health legitimacy. But I do not think it was the prime driver in running this project. I think we need to work better targeting multiple stakeholders and their motivations and this creates multiple drivers. We need to target the stakeholders, who do we want to move? Who can we move? And I think we need to address what partners do well. The industry is very good at making majestically solutions and we have health. We are starting to do more and more projects as we go in and we do not do interventions mapping exercise because that is very time consuming, very costly but we do a really quick stakeholder analysis. And when we do this we ask what is in it for me? Or what is in it for them? And that is kind of defining the motivations of the stakeholders when working in projects. What we really need to do is to translate evidences into easy to

read messages. One of the examples was translated in the sick leaves in just comparing it. Decision makers will have to understand how they think and we have to understand what they understand and then we have to take our evidence and putting them into their perspective. This is a project where there was demand for the project. We need to look at we want to work in areas where is a demand or do we want to identify the societal needs and look after them. It is a lot easier when there is demand for product or concepts. It makes it getting it ruled out a lot easier. We heard a lot about the science of how F&V affect health we heard about how we can measure effects of these interventions I think we need to work toward.(...) We need to start looking at the science of implementation. How do we implement these projects to have a maximum effect? How to we rule this out so we are reaching enough people to actually make a difference on public health? And then we can measure the impact on public health because before we can actually make an impact we should try to do that. That is kind of the key success factors.

I would like to finish by looking at the things of future works. We need to continue creating arguments and incentives for sectors, branches with low uptake with this program. We can see that some of the sectors are financial institutes there are about 70% of our financial institute banks that have this worksite fruit program. Then we have other branches like construction that are really **low** so we need to figure out how we can target those groups. We need to identify new partners as labour unions, insurance companies, and health insurance companies. If we find out what is in it for them we might be able to involve them and working with these projects. We need to increase public support, workplace health promotion in a general framework. We have been thinking about doing some work similar to what we have been doing with the School Fruit Schemes by “kick-starting” hard to reach workplaces and what we know is once you get this program in the place, actually, seeing how it works,



experiencing what it does, break down the barriers that are perceived by the workplace. One of the things we have done at the Cancer Society is that we organised a worksite fruit branch organisation. So we have the suppliers in the work site fruit. We operate as secretary for the branch and we also have kind of helped them along the way and hopefully by next year they will be running on their own. What we are doing now is that we are working on some events at the Cancer Society. We are targeting working with governmental, municipal employers to organise serving fruit

at meetings and we are using our volunteers at the Cancer Society to do this and this kind of help. (...) What we are trying to do is to encourage that the F&V served throughout the work day. (...)

I will finish by saying that is extremely important that we work in partnerships because we can make a lot more effective solutions but to do this we have to understand our partners' motivations and their needs and then address these. One of the very important exercises is if you can get you partners around a table and if you can convince them that this is a good project in a short period of time then I think that you have a winner.

Q&A

GL HANSEN: I just want to make one comment and that is actually, private companies have offered canteens or commodities where they do not have the resources or do not have the possibility of producing Canteen take Away. They have offered to deliver CTA to the canteens where they do not have it. So I see that we have a financial incentive here like we saw in the case of company fruit and work site fruit and because there is a demand for these CTA and I hope that I am going to work on this demand and answer it some way.

SESSION 21

TOOL KIT: ADAPTATION AND IMPLEMENTATION OF INTERVENTION PROGRAMMES

Chair: **R Lemaire**

- Introduction: Toolkit: Adaptation and implementation of intervention programmes: a practical guide. **R Lemaire**
- Brand development. **E Pivonka**
- Resource development and challenges within a developing country framework. **J Badham**
- Overall partnership development. **Ch Rowley**
- What is the toolkit? **R Lemaire**

Introduction

Toolkit: Adaptation and implementation of intervention programmes: a practical guide

Ron LEMAIRE

Canadian Produce Marketing Association, Ottawa, Canada

The session we are going to see is quite exiting. This is our official launch for the International F&V lines of our practical tool kit that has been under development or under discussion for development the past year with the support of IFAVA board and specifically works that come out of the New-Zealand and the development of core elements of the drafts. We have been able to develop our on line tool. And again the rational behind the development of this tool really goes back to 1998 when the Produce for Better Health Foundation and partners in the US began developing these international symposiums in the framework by which many of us currently work with for these meetings. Back in 1998, a group of 6 to 10 countries met approximately to discuss how we run 5-a-Day type programs. What do we need to do to share information and build synergy to develop our brands, to penetrate the market, to increase consumption? That was really the stepping stone of the Foundation to what IFAVA is now today. The opportunity to share the information and to answer questions from those countries that had not developed the comprehensive 5-a-Day program and even the countries that had developed some type of F&V intervention programs in their country but are looking to expend and develop further, these face to face meeting are a key step. But once we left the meeting we found what was more important is a continued opportunity to do interact with one another. IFAVA provides that opportunity through our membership and our meetings that we hold throughout the year. Now this toolkit is an extension of that sharing of resources and sharing of information for not only countries that are looking at the programs but looking at developing from nothing to a program that can hopefully increase consumption of F&V nationally but also for develop programs to look at areas potentially that they want to expend upon whether it is within branding. It may feel their existing program designed as a branding background that they feel strong enough or in area fundraising or in area of evaluation and I will touch a little bit further on these touched components at the end of the presentation.

To launch the toolkit today and to give everyone a true understanding of what this practical toolkit can provide in means of support, what we have done is taking 3 core areas that are focused on the toolkit. We are fortunate to have Elisabeth Pivonka from the Produce for Better Health (PBH) Foundation in the more matters programs to touch on brand development. PBH recently has gone through a total restructuring with the launch of their new food pyramid and the repositioning of their brand. They have done some very dynamic work on brand development and she will walk you

through that. We then have Jane Badham from the 5-a-Day for Better Health Trust out of South Africa to bring a perspective from developing countries and what framework they need to work within and some of the challenges that they face in developing a 5 a Day program and implementing those strategies within a developing country framework. Then the key piece that many of us continuously either have success or struggle with is our partnership development. In this room we have a cross section of industry representatives, government and the health community and educational institutions. This is a perfect representation of what we need to do to move forward and drive 5 a Day intake messaging. Chris Rowley from Horticulture Australia and the Go for 2&5® campaign will touch on an overview of partnership development, what we need to do to expand that focus within our programs.

Before starting I just want to reiterate, this new toolkit will be available on the IFAVA website. The toolkit is a practical guide. We have taken the best practices and key elements that we found from programs, from our existing membership and even from this conference; I have been speaking with many programs such as Fruit Dude and other in the market place. We will be expanding. It is a living, breathing document. Because of the benefits have being web based, we will be adding to it, moving from it, ensuring that we are recurrent on the most updated information around the core elements that will be given to after the presentations. It is a very dynamic tool and it will be available to the world to access and hopefully utilise in the development of their interventions and programs around increasing consumption of F&V.

Brand Development

Elisabeth PIVONKA

Produce for Better Health Foundation, Wilmington, USA

What I am going to do is to give you an example of what we have done in the US. Just to give you a little bit of background about why even we are looking at new brand development, back in 2005 our dietary guidelines changed in the US. Every five years our government looks at the dietary guidelines. This time we were very pleased to see, to hear and to learn that the recommendations were anywhere between 5 to 13 servings of F&V a day as opposed to the 5 to 9 servings a day that we have had before. So what we thought was we had to take a step back and look at our messaging. Our awareness levels were over 50% of the need to eat or more servings a day in the US but our consumption level was not going up. So we taught given the fact that we were already getting a little bit of push back with our 5 to 9 messaging we thought people will really flip out if start to talk about 5 to 13 servings a day. We had to step back, take a look at our messaging, see if we had the right message for consumers and decided to go through a branding process.

Having not done anything like that before we were a little bit of a lost toward the beginning so we did something that I had not heard of before. We actually hired a firm to help us find the right firm which was an interesting process. We have heard of head hunters who help you find the right person to employ, so we hired a gentleman to help us identify the firm that we wanted to work with. This gentleman narrowed down a number of different agencies and identified 32 of them force and when I say us I mean all of our federal partners and colleagues, those involved in American Cancer Society and we had 4 people from our staring comity Produce for Better Health Foundation executive committee so we had marketers involved. CDC was heavily involved. So we narrowed from the 32 represented and narrowed down to 4 and we had a review of these 4 agencies. Interestingly of all the agencies had a process that they went through that was fairly similar. We happened to go with an agency called Sterling Brands out of New York.



This was the six-stage process that they shared with us that they wanted to work through with us. I share this with you because this is typical of branding. Also for the agencies that physically represented to us had a similar process whereby the first half is spend on understanding the consumer and understanding positioning and how you want to position your brand to consumers. The last half from the stage four through five is in developing the brand identity, the actual physical logo. So these were the six stages that we went through. I think the most important stage were the first three, the immersion, the invention and the validation. In that emerging phase we spent time talking to opinion leaders and to consumers. In this time we spent time talking to 20 partner opinion leaders and that included government agencies and included supermarkets, a couple of restaurants and some of our state departments of health. So we talked to all of them about what we were doing, their opinions on where we were going pros and cons about we had done in the past. Then we compared ourselves with other culture-shapers and analogs. For example, there other 5 A DAY programs worldwide and we thought some were doing a particularly good job so we compared ourselves to some of the other programs. I think France in particular, we liked what they were doing and we compared ourselves with MTV, Wal-Mart, the bottle water category, the yoghurt category. What have they done that we thought was successful? We looked at all of that and then we went into extensive consumer research where we conducted some ethnography. When you are going into people's home, you look into their cupboard and see what is in their cupboard; you ask them questions about why they are or not eating F&V, look into their refrigerators and for a couple of families we even went shopping with them just to understand what they thought about F&V. Then we went into the consumer focus groups. In fact, if we go back, the emerging phase was all the interviews with people that included all of our ethnographies, we looked at previous researches, and we compared ourselves with culture-shapers and other analogs. The invention phase we actually had our entire core partners coming together with Sterling Brands and think through some what they had discovered from the ethnographies. We talked through some things to develop story board basically that we then took to the focus groups in the validation phase. You can see where we took some research used it is a bit of an art of science combined as we use the science to help with the art of it all.



The brand positioning: to give you an idea of what positioning is: it is what your brand stands for in the hearts and minds of your customers relative to your competition.

First of all Sterling Brand recommended to us that we talk with moms in particular in focus on messaging and understanding of what moms think about F&V. The reason we selected mum is that we can not talk to the all population; we had to narrow it down and talk to somebody in particular. We selected mums for a couple of reasons: there are still the primary gate keepers to what the family eats and they also are still the primary responsible for the health of the family. So we went to our focus groups, first settled focus group with mothers and we developed story boards. They had visuals, words on and were slightly different when we put them into these 4 quadrants. We put each of these positioning statements in each of these quadrants. We shared with them the story boards and we had a paragraph that explained the positioning behind the story board. We asked them to cross out what they did not like in the positioning statement and circle what they did like. So we learnt basically what they liked and did not like about each of these positioning statements. In the end pulled an arm from one and a leg from another to develop our ultimate positioning statements. But we had to tease out what they liked, what they did not like about each of these first before we could do that.

The quarter "Serve up the passion" was basically about the wide variety of F&V that are available, fresh, canned, frozen and dried, they all count. So many different varieties, they all taste great, you can prepare them, make them for you family and they love it. One of the things that mums liked about that was that they did not

realize all forms counted that is easier they know that all forms count, they can actually do that it is not so overwhelming. They liked the fact that all forms counted, they forget that there are over 300 varieties and more of F&V because we often stocked eating the same 5 or 6 or 7 all the time. That was a reminder. The idea of doing a lot of cooking, they did not like. In fact, some of them said that all they can do at the end of the day is put the groceries away, let alone, put a really pair of fancy meal for my family and they are not going to it anyway so the need for convenience was very important, that is what we learnt from that quadrant.

In the “Thrive” corner we have words like nursing, inside out and basically mums really liked the tone of this positioning. They liked the fact that it was all about taking care of my family. They really like the tome of that one.

In the lower corner was the “Prime to perform”. That was all about performing at your peak, performing at your best day to day more than an immediate return. They liked that, we actually had a tone down our statement a little bit because we used the word ‘machines’ and they thought that will work for men but that is just not going to work for mums. So we had to change our tone a little bit as we went to our focus group testing.

The other lower corner “Appetite for Life” was about the disease prevention aspects of F&V. What we learnt from this particular quadrant was that consumers really valued and they knew about the importance of F&V but how do you talk to them about the health benefits was very important. They did not want to be scared into eating F&V, they did not want to be preached at and they did not want to be made to feel guilty about how many F&V that they were eating. But they liked the benefit; they knew F&V were beneficial. How we talk to them about it, they liked the tone of the quadrant and that is what they liked in the end.

Basically 5-a-Day for us at least in the US, we spend a lot of our time in that quadrant and what we are doing with our new campaign is moving us a little bit more to the “Thrive” quadrant taking the bits and pieces out of all the quadrants that worked. If I were to summarize where we were in the past and where we are going in the future. We are going more from the left low quadrant (Appetite for life) to the upper right hand quadrant (Thrive).

Some overall leanings from our focus groups basically attitudes to, and usage of, fruits and vegetables, vary greatly. In fact Sterling Brands talked with us about do we need a different campaign for fruit versus vegetables because fruit is easier to get your family to eat it. It is sweet, kids like it. Vegetables, you have to do something to do them, you have to clean them, prepare them and you have to eat them with something as you do not often eat them plain. But in the end the health benefits were the same they recommended keeping it together. The importance of F&V was universally understood. Tonality is critical in motivating moms to do more, they did not want to be preached to, they did not want to be scared to and they did not want to feel guilty about what they were doing. Consumers believe they are getting enough fruits and vegetables so the challenge was to convince them how much they

should eat. And the most compelling motivation was that it all adds up so focusing on small achievable steps overtime was important. Automatically and this is the piece of our branding we often forget is that we needed to tap into an emotional benefit for the consumer, not just the factual benefit of health but the emotional benefit. Our emotional benefit was tapping to mum's internal gratification from meeting her responsibility to help her family be at their best. They are not too many things mother would not do for their families and for their children so we can tap into her sense of responsibility and how good she feels when she does the right thing. That is what will help us increase consumption.



We developed our own brand pyramid as opposed to just to a logo, we have a brand pyramid. Where we have brand attributes at the bottom, these are varieties of types and forms of foods fresh, caned, frozen, dried, 100% juice, there healthy they taste great and nutritious. In fact, Sterling Brand said to us they work with a lot of companies they do branding. By the way, this process we were going through is what other firms do. So Nike®, Coca-Cola® and Pepsi-Cola®, this is what they do when they develop branding and SB said, any other firms that we are working with would love to have these brand attributes, nobody they worked before had such terrific brand attributes. So we need to recognise that we have great brand attributes. Our functional benefits are helping prevent chronic illness, provide sustainable energy, hep promote well-being of mind and body but emotional benefits are here that they keep you at your best and it makes you feel better. Mum's emotional

reward again internal gratification from meeting her responsibility to help her family be at their best. Our brand's attitude is one that is straight-talking, passionate vital and optimistic and you see this in our materials, in our websites so it is not just about a logo, it is about how you talk to consumers overall the tone that you use and so on. And our brand positioning basically was that more matters, more F&V matter. In fact, as we were working on this positioning CDC was animated that we will be specific that it is F&V that we are talking about. So we made sure it is F&V we noted here. It is F&V more matters; it is not anything that you eat more matters. It is also unusual that a brand positioning is what is recommended for our logo development. It is not typical of that to happen but in our case SB recommended using our brand positioning in our graphic development.

Just to give an example of why positioning is so important. This whole positioning phase is the piece that we in public health forget. A good example of why positioning is important is, in the US we had a campaign, we had a problem in taxes. We are in the mid-1980s, Texas Department of Transportation (DOT) was concerned about highway littering in its state, it was a real problem. The biggest culprits they found were young male aged between 18 and 34 that had a real macho identity. DOT developed that strategy that was a real tough-talking campaign to appeal to these tough-talking who, by the way, were very



proud to be Texan so they had strong state identification. They developed this campaign that was called "Don't mess with Texas" and they had billboards up around the state and had paid a bit of radio to go along with. To the course of the 5 years between 1986 and 1991 highway littering was reduced by 72%. That is phenomenal! It is unusual to have quite that much of a success rate. They knew what their target audience was, they developed a message specific to them, it did not turned off the rest of the population but they had to develop that targeted the specific audience that they wanted to speak to. Someone within the DOT wanted to add the word please in front of "Don't mess with Texas" and as you can imagine "Please don't mess with Texas" would not have work with these tough-talking young men.

So what we did is we developed a positioning that works with mums and then we tested it with population at large through some online consumer testing, to make sure it did not turn people off. We also talked to dads actually, to make sure that they were okay with this because we did not want to turn dads off. We even checked out the words veggies versus vegetables, people though there was a problem with that. They though veggies was less 'in your face' so we went with the word veggies instead of vegetables.

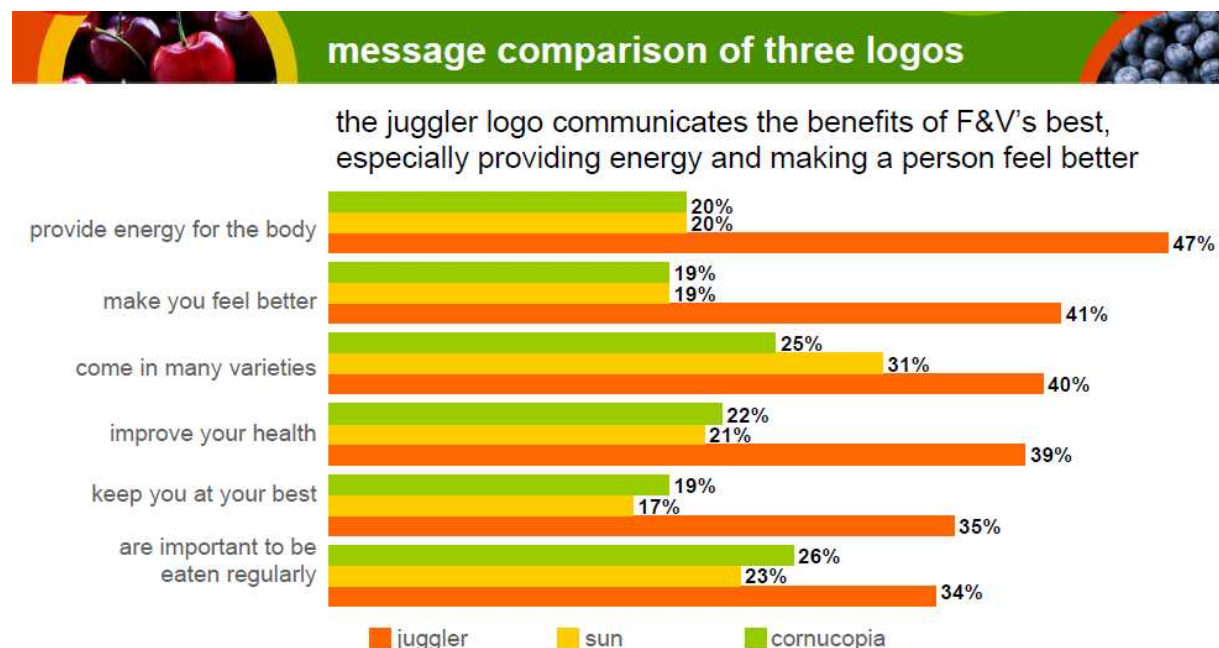
We did all that positioning work that took about half of the time and was the most important piece of the work that we did. Then we went down to the resources of information, we went down to the bottom to hear the more focus groups. We had some graphics that we presented, we narrowed it down about 5, we took it to our focus groups, they narrowed it down to 3 and then we took those 3 graphics and

went to consumers on line on a quantitative survey. Just to give you an example, the selected three:



The sun was a little bit of playoff of your 5-a-Day logo but these are the 3 we tested on line within a thousand consumers.

Part of what we were testing was not just asking do you like the logo but how well the logo communicated our core messages. Just few examples of our core messages were to provide energy for the body, make you feel better, come in many varieties or improve you health.



Q4/5/6. Using the 5-point scale shown in the grid below, how well do you feel this logo communicates that...?

15

As you can see, the juggler logo ranked higher than all the others. We were a little bit worry that they would come out equal but the consumers decided and we did not have to make any kind of choice. Consumers told us that they preferred the juggler

over the other. That is then our new identity. This is replacing the 5-a-Day program in the US. We launched it about March of 2007 and we have a rule in transition because right now 5-a-Day is on our packaging, in our supermarkets, the state health departments were using it, we do not want people to throw away the inventory. So it is useless to replace 5-a-Day when you reprint your material. Our goal was to try to have everybody have 5-a-Day out of circulation as much as possible and replace it by the end of 2008. We gave and encouraged people to have 2 years to do it. Just as a bit of a comparison, 5-a-Day of the past, we were talking about 5 to 9 a day until recently. 5-a-Day was really functionally-based, instructional, informational and 'More Matters' is we believe more emotionally-based, tapping in the mum sense of responsibility. We believe it is more inspirational. There is no limit really and over 90% of our population is not meeting their recommended amount of F&V according to our legislative guidelines. In theory, 5-a-Day is consistently changing because our dietary guidelines were updated every year and we did not want to be stuck with this problem of our numbers changing again in the future. So we felt 'Fruit and Veggies More Matters' was more a stake in the ground, it is the kind of thing that we can stick with for the next 20 years if we needed to. 5-a-Day retreaded more as a logo in the past and 'Fruit and Veggies More Matters' was retreating more as a brand and how we talk to consumers and what our visions look like. 5-a-Day was a bit more of an awareness campaign moving more in that lower left hand quadrant seen earlier and 'Fruit and Veggies More Matters' is moving it to the upper right hand quadrant a lot more of the 'how to'. Mums knew F&V were good for them but they needed help in how to get their family to eat more.

To put in the context on how we are disseminating the message that was our brand development. We continue to do the research with mums in particular from our public relations standpoint we focused on young mothers. The other way we get our information to consumer is our national partners: CDC which is one of our more federal partners, they set the criteria by which the product can carry the logo on packaging. Not only did the process of branding take some time but we also had to get CDC and USDA and National Cancer Institute to agree to use it. There were some concerns with obesity epidemic that we tell anybody to eat more of anything but because it was specific to F&V they were all very comfortable with that but that took a little while as well. So there are helping us and support that message. Of course the Diabetes Association, American Cancer Society and Heart Association are also partners. It is a continual effort on our part to try to get them to do more with the branding and the messaging but we continue to move forward on that front. We also have the National Council of Fruit and Vegetable Nutrition Coordinators which is a group that represent each of state department of health so they work together and help us disseminate the message. We also have food trade associations representing the fresh, the canned and the frozen industry who are national partners and we have another group called National Alliance for Nutrition and activity that help with lobbying in Washington to change health policies to increase F&V consumption nationwide. These are examples of how some of the states help us at

the grass roots level: North Dakota e.g. was able to get billboards so they had this throughout North Dakota for our launch last year in 2007, in Texas the state proclamation, in Hawaii a lot of media work they were doing, Florida some worksite programs and in Idaho they had a chef cooking similar to what we have done at a national level. We work heavily through supermarkets. We are in over 25 000 stores today and that represent 70% of all of the US supermarkets.

When you figure that they are over 10 000 consumers in presson every weeks through each of these stores, retail is really important for us in getting our message out to consumers. In fact, with 5-a-Day we asked consumer how they knew about it and the top three reasons were supermarkets and packaging and the media. There were the top three ways they heard about 5-a-Day.



This is an example of how the suppliers were using it on packaging. They were putting as well on their private label such as Schnucks; the store brand is included in the private label. We work as well with the media as many of other countries do. We have nutrition education materials that we try to reach out to



educate the health professional with. Then we have the website specifically for young mothers and this is the only that was going direct to consumers ourselves we go through all of these avenues the rest of the time to reach consumers.

My last point is in the IFAVA toolkit and I encourage you to find the study “A 10-year retrospective of research in health mass media campaigns: where do we go from here?” by SM Noar (2006) in the IFAVA website because it tells us that Public Health campaigns are more successful when campaign managers do formative research, understand their target audience, segment their audiences, design messages targeted to those audiences, use many message channels, conduct process evaluation while campaign is running which we continue to do we have some baseline research on our young mothers that we did some follow up research on this year we will continue to monitor those young mothers and we will be also measuring at actual consumption data but that is expensive so we will be only doing that every three years and then outcome evaluation and ultimately will be at measurement of consumption specifically with our young mothers and their families compared to the rest of the population overtime. So that is about how one country at least did some brand development.

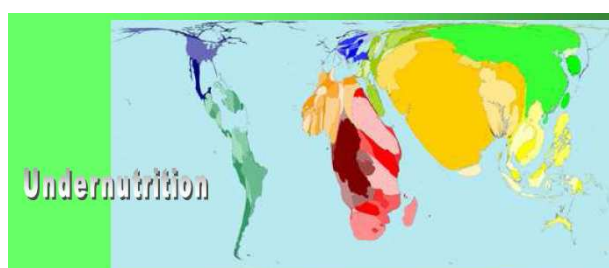
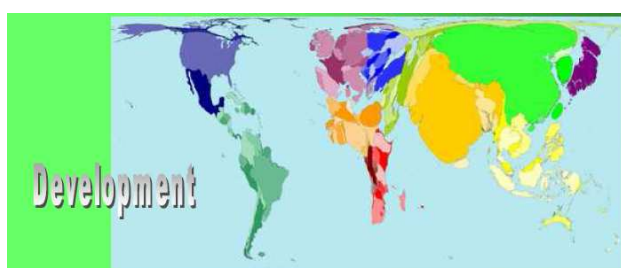
Resource Development and Challenges Within a developing country framework

Jane BADHAM

Dietician, South Africa

This is very exciting to see the launch of the IFAVA toolkit and I will explain to you how valuable being an IFAVA member has been in getting 5-a-Day in South Africa going.

I am going to focus on setting up a 5-a-Day program in a developing country highlighting the kind of challenges you have. Just to remind you from where I come is the centre of the world, Africa and that South Africa is at the southern most tip and is often considered as the leader of Africa in terms of projects and programs. So we certainly hope that our 5-a-Day program will be an inspiration throughout the continent for others to also get a vegetable and fruit program started. An excellent website that I can highly recommend to you, is worldmapper.org where they take recognized statistics and use them they change the shape of the world to highlight the impact of the particular issue.



What I would like to draw your attention to is when you firstly look at the world in terms of development you see how the shape of Africa changes and how red it becomes based on development, highlighting the development challenges we face. Likewise when you look at what happens when you look at undernutrition. Much of this summit has focused on obesity and although it is important in developing countries, we need to remember that for developing countries undernutrition is a major concern and requires urgent intervention. This highlights that when you develop a 5-a-Day type program in a developing country, you are going to have some critical challenges that you have to address. If I move closer to home in Africa and come back to South Africa, our Medical Research Council recently released a risk assessment of 17 risk factors for disease and death:



- | | |
|--------------------------------|-------------------------------------|
| ■ Sexual & reproductive health | ■ Physical inactivity |
| ■ Violence | ■ Undernutrition |
| ■ Alcohol | ■ Iron |
| ■ Tobacco | ■ Vitamin A |
| ■ Excess body weight | ■ Unsafe water sanitation & hygiene |
| ■ High BP | ■ Indoor air pollution |
| ■ Diabetes | ■ Urban air pollution |
| ■ High cholesterol | ■ Lead |
| ■ Low vegetable & fruit intake | |

If you take a close look at them, you will see that almost half of those are directly linked in some way to nutrition and even F&V consumption. In fact, what you see is that the low intake of F&V itself is even highlighted as one of those 17 risk factors. So this shows how important it is to have this type of program in a country such as South Africa.

The reality based on WHO figures is that in Sub-Saharan Africa it is estimated that we have a 27kg to 114kg per capita per year consumption of vegetables and fruit. Many of you would know that the WHO goal is 146kg. If we look at South Africa, per day we see that people are eating only about 205g and again the WHO goal is 400g. The Medical Research Council states that South Africans are having less than 3 of the recommended minimum 5-a-Day servings. Research also shows that sadly 1 out of 2 of our children do not get 50% of the RDA for a range of exceptionally important nutrients most of them being micronutrients, vitamins and minerals mainly found in F&V. Added to this we have sad fact that it is a reality in many of the developing countries where in a single family scenario you will find a child with 'hidden hunger' (micronutrient malnutrition) who has an obese mother and does not have a father because he has already dead of a heart attack. We do not only see it in one nation; we see it in single families and that is a tragedy. Then we are reminded by global projections that in the next two decades, the burden of disease and especially chronic disease, are going to be largely carried by developing countries. So when you have a situation like this, it becomes very clear that you have to intervene. What it also shows is that you have to be aware that developing countries have a real mix of health challenges and the types of messages that you are needing and trying to get across to the population. You are trying to deal with obesity and heart disease and at the same time you are trying to deal with undernutrition. It is also hugely

important to really know who you are trying to reach and to clearly define your target markets. If you look at South Africa, you will see that we have a population that is the majority has a very low average household income. Poverty is directly linked in terms of health outcomes. South Africa has over 40% of poverty level with a 41% of unemployment level, which are believed to be conservative figures and the life expectancy is not even 50 years. Added to that, when you are looking at who you are going to talk to you, you will see that a third of our population live in informal and traditional dwellings, only a third have piped water into their home (which impacts on food hygiene and safety) and only a half have a flush toilet. It makes you very aware that you need to clearly understand the target market you are trying to reach and ensure that your messages are appropriate.

In South Africa, our Department of Health has developed food-based dietary guidelines and one of the 11 guidelines is to 'eat plenty of vegetables and fruit everyday'. They support the 5-a-Day message, so we talk about eating 5-a-day in line with and clarifying 'eating plenty'. Our research showed that people do not really understand what 'plenty' is and they wanted some kind of guide or goal to strive for. I also want to indicate how important the words that you use are. In South Africa we very



clearly talk about eat plenty of vegetables and fruit – putting vegetables first. Our research show that when we talk to our community about fruit and vegetables (with fruit first) they found it unachievable because they see fruit as being expensive and difficult to get in into their diet. When we turned it around and say eat plenty of vegetables and fruit people started saying that is something that is more achievable for them. So really it is important that even the wording used is something that you look at and you do not just take for granted.

In addition, hugely important often in developing countries is to look at the issue of myths and urban legends. This is important when you are doing a program of this nature because for example we see in many of our cultures that fruit is regarded as food for children and not food for men. So it is very important that you are addressing those kinds of issues as well. We also know in many of our cultures, the men must to be served the food first and that the children often get what has not been eaten by the others, this is also important when you are looking at your messaging. You will get many urban legends as well about the certain types of food and what they do for your health and you might find that you hear that certain vegetables or fruit are not considered required by certain people or there are myths

and fallacies around certain foods that need to be addressed. We also have to remember importantly that in many of these developing countries, certainly in the continent of Africa, you have to be looking at the difficulty of access and growing. In many of these countries we are looking at seriously arid conditions where access to water is difficult. You need to be looking at the component of food gardens and encouraging the growth of vegetables within the context of the home itself. We have also been able to see that unfortunately you often find a loss of the indigenous vegetables particularly and fruit over time and that they lose their traditional values and even the kind of recipes for using indigenous food becomes lost. This is critically important. Only recently in a meeting with our biggest fresh produce market on a joint program that we are going to be running, the marketing director of the market told me that it goes against his thoughts to eat 5-a-Day because he said that when he lived in a rural area in poverty, they ate a lot of vegetables because they grew them, it was about subsistence and so when he came to the city and got a job and started to have an income, his aspiration was not to have to eat vegetables, but to be able to eat meat and take-aways. So we are telling those people to go against what their aspiration is by saying you have to eat plenty of F&V. Those are real challenges that you are dealing with in a country and if you do not recognize them your messaging might not be heard or want to be heard.

So where does that take us to in terms of how you work in a developing country? The reality that we have to realize in developing countries that although governments are very important partners, they have very limited resources and limited knowledge. It often means that the F&V message is not high on the priority list and there are not going to be able to be counted on to do any of your research for you and certainly not to provide funding. I am very proud to say one of our key goals when we started the 5-a-Day program in South Africa, was to get the Department of Health on board. And we achieved that. Now I can proudly say that we are the official partner of the Department of Health and their guideline to eat plenty of F&V everyday, however that does not assist us when it comes to funding and research because, believe it or not, the government often turn to us, the NGO, asking us to please provide funding, research and educational materials. We consistently have to remind them of the fact that we ourselves are an NGO. We do however work with them on specific campaigns and the two that I am proud of is that we have a National Nutrition Week in our government health calendar and for the last three years the eat F&V message has been the key driver of National Nutrition Week. But I do have to say nothing would have happened in these weeks, if it had not been for 5-a-Day, because the Department of Health's communication skills are not great and they have a very slow process for approval of any kind of press release or campaign. We also work with them on the World Food Day program and we are looking at ways of being able to be creative in driving the F&V component. The positive that the government partnership does bring to us, and that is why I invest in it, is the fact that we are able to get quotes for press releases and

this does hold value with the media and really does help add credibility to our message in terms of the consumers when we talk about the fact that we are partner of the Department of Health, so it is important. However we have to remember that is also important to have these other partners on board. I will stress the need to partner with academics because they are people who are amazing in their ability to give you their time and expertise for free. The academics are the people who really give input to us and give advice and are able to share research with us. So academics are a hugely important to us. Other NGOs who have a similar message to us are also important partners for us. But of course, any organization requires funding, so hugely important are private partnerships. The 5-a-Day for Better Health Trust in South Africa is funded solely by private partnerships. That is our retailers, our growers, our market agents, our markets, and our food industry.

I will share some of the key challenges that are often forgotten in other countries that developing countries have.

In South Africa we have 11 official languages so if you are going to address people where they are at and so they can understand you have to be aware of the language issues and these have to be taken into account. We spend a great deal of time motivating within community radio stations and then having to find appropriate people to be able to be our spokes-persons in those languages. So language is a very important concept and I can tell you that some countries in Africa have more than our 11 official languages.

Another really important part is developing media buddies. Because again in comparison to many developed countries that have relatively large budget and are able to pay for paid advertising, we do not have those kinds of budgets. So we really need to have media buddies who we can work with. Apart from doing what I call a spray and pray press release campaign or two press releases a month, we also work very closely with individual

publications to give them exclusive stories and to really work with them on stories. This is an example of a campaign, where we worked with a leading magazine that reaches one of our key target markets, where we managed to get a 4 page spread that they even titled 'Save your life diet', which was just about how eating more F&V is important. And we were able to work with the publication to take four of their

The Save-Your-Life Diet
 story by PATRICIA MCCRACKEN
 That's one large carrot, a large tomato, a medium banana, an average peach, half a cup of cooked veggie, three-quarters of a cup of salad greens, a medium bunch of grapes...
 But because we're not doing that we risk joining the 2.7 million who might die if they don't increase the amount of fruit and veggie they eat.
 Because we've forgotten what gogo and mom told us, the World Health Organisation says we've pushed something as simple as low fruit and veggie consumption into the top 10 risk factors contributing to death.
 According to the WHO, in the developing world:
 ● Cancer is set to increase by a scary 73% between 2000 and 2020, with Africa already losing four jumbo pots full of people a day to the disease.
 ● Most of the world's heart disease problems and deaths will occur in Africa in the next two decades – almost 20% of high school learners are already overweight and 4% are obese.
 ● Diabetes is set to double by 2025 – already it's believed there're 3 million diagnosed
 Y... YOU WANT to have fun? You want to look great? You want to live as long as possible? There's an easy way – eat more fruit and vegetables! Yes, it sounds like your gogo talking, but this is one of those old truths that's a good truth.
 On average, South Africans eat less than half the five servings a day of fruit and vegetables they need to keep healthy, reports the Medical Research Council.
 So many of us fall victim to diseases we could have prevented by eating five easy portions of 90g of fruit & vegetables a day.

Media buddies
 It's so easy to be healthy!
 Sifiso Ngweni, a 26-year-old FRU account assistant, Sifiso Ngweni is living away from home for the first time in a shared flat. His biggest...
 He's still hungry later, he might make two, plus a glass of juice, a banana and a beef stock cube or have some more bread.
 On Friday night he tucks into burgers with his girlfriend, then shares a big packet of chips and chocolate while watching TV.
 Breakfast on Saturday and Sunday is four fried eggs with bread and marmalade.
 Saturday lunch is pap and wena and more magic: stacks of sausages and raisins, chips and biscuits, and a take-away dinner.
 On Sunday, his girlfriend will cook a big lunch of red meat or chicken, rice, gravy, sauté (all with mayo) and sometimes a bit of veggie.
 He'll finish the weekend either with leftovers or a bit of special with a spritz and cabbage from his mum.
 One month later: "I've discovered a whole lot of new foods!" says Sifiso. "It's feeling different, healthier."
 Breakfast now includes avocado on toast and dried fruit instead of chocolate. During the day he drinks fruit juice instead of cold drinks and has replaced biscuits with apples and oranges.
 At some of his favourite take-away places he's discovered he can swap the chips for coleslaw – so he still gets his carbohydrates!
 He admits he's had to get used to paying more than R10 for a packet of apples even knowing it'll last a week.
 Sifiso's girlfriend has also seen the light – but they're going in a few minutes.
 "I realise that thinking about my food choices is becoming in my life," he says.

The Takeaway King
 Who is he? A 26-year-old FRU account assistant, Sifiso Ngweni is living away from home for the first time in a shared flat. His biggest...
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Help yourself to great-value health
 ● Choose vegetables and fruit when they're in season because they're cheaper.
 ● Buy vegetables that haven't been prepared (peeled, sliced, chopped, dried) as these can be very expensive.
 ● Add vegetables to casseroles instead of serving on their own and you'll be able to use fewer.
 ● Consider buying bulk packs as they work out cheaper.
 ● Look out for specials.
 ● Cook together with friends and neighbours so you can buy larger amounts direct from the market and benefit from the cheaper prices.
 ● Start your own veggie garden – carrots, beetroot and spinach are easy to grow and don't need much space.

readers and we starting by taking a detailed diet history from them without biasing them about F&V. We then encouraged and challenged them a month to try and achieve 5-a-Day. We gave them ideas on how they could achieve it and then we revisited them at the end of the month and got their stories and their ideas and how they had managed. As a result of this we have got the very nice 4 pages spread that would have cost us if we had to buy it, a real fortune. So developing your media buddies is really important when you have a limited budget.

Along with comes harnessing opportunities. We realized that an organization like 5-a-Day needs a face that consumers want to see as the person that is behind the organization. I am a relatively well-known dietitian with some TV and radio



exposure and so I am currently the face. But we are now moving to a phase where we are in the process of finding a patron for the 5-a-Day for Better Health Trust. We are in the process of interviewing possible patrons, that through our research are liked, credible celebrities to take our message further. So you need to really look for opportunities to get your message across. For example on Valentine's Day, we delivered a parcel of red F&V to a

number of our media and we included a press release with interesting information on how each of the red F&V that we had included could positively impact on your love life. We got a huge amount of coverage for our message. Because we really so much on free media work, we have developed a 5-a-day journalism award. We do have a nice financial reward for this, which is more affordable to us than the costs of placing adverts in the media. In having this media award, we able to generate a number of stories because I am quite happy to be involved in the stories and provide the media with the information that they need and I am happy for them to have ownership of the articles. We want to create heroes for our cause and this championing has really worked well. So that is another thing that you can do for a small financial investment. We also developed special trophies to give out that are attractive.

We also must stress the importance of growing and valuing partnerships and this is partnership at all levels. Our Cancer Association has an annual shave-a-thon where they shave and color peoples hair to raise awareness and funds for cancer programs. We get involved and last year made sure that every single person that came to the centre where were involved got given a piece of fruit and a pamphlet about the value

of vegetables and fruit. It is a great way of communicating with people because while people are having their head shaved or colored, we are able to interact about how important V&F are in the diet. So we have relationships with the Cancer Association and the Heart and Stroke Foundation in South Africa. This year the theme for Heart Awareness month is 'Know your number' and so of course 5-a-Day fits perfectly! In addition to knowing your cholesterol and your blood pressure and glucose values, the campaign will push know that you need to eat at least 5 servings of vegetables and fruit everyday. I must also stress how very important is global sharing and a key element for developing our program in South Africa, has been our relationship with and our membership of IFAVA. Everything I have been able to share with you about our relationship and what we do as a project has been because of the interface that through IFAVA we have with other countries with similar programs. So we have been able to learn much from what the US, New Zealand and Australia have done and been able to ask questions on issues of importance to us. If you make use of IFAVA, it can actually take your program to a totally new level and you certainly do not feel alone as I think many of us in developing countries do.

In addition of course food retailers are critical as partners. 'Pick and Pay' is one of our largest retailers and we have this year been able to do a school program with them where we have reached 1.4 million schoolchildren with the 5-a-Day message and they will also soon be carrying the 5-a-Day branding on their fresh produce packaging. On all of these are important if you are looking for win-win possibilities. You need to design your program together with your partners; you need to be able to look at what they need, their expectations and how you can deliver on those as well. That is the reality when you are working on a very tight budget.

But we cannot neglect, and I continue to remind to all of us, that we need to be measuring our success. For us, we did a baseline study on consumer perceptions and views on vegetables and fruit and whether they even knew about 5-a-Day. We have now implemented our 5 year strategy and at the end of the 5 years, we will repeat the study to see if we had an impact on perceptions and in knowledge. It is very difficult to do studies around consumption but our Medical Research Council has just done this research and it would be great if this could be repeated at some stage to see whether we really have had an impact. So no matter how small your budget is, do not to forget or neglect the research component of research and evaluating your program because that is really important, if we are to truly be able to say that we have made any difference.

In closing, very often in developing countries, starting a 5-a-Day type program is going out on a limb. It is taking a chance as we usually have a very small budget and not much infrastructure, but after all, isn't it out on a limb where the fruit is I hope through this toolkit, where the South African study is the developing country case study, we will be able to see growth in developing countries of 5-a-Day type

programs. After all, I believe these are the countries where we need to see a growth in these programs because it is in developing countries that an increased consumption of vegetables and fruit can have the biggest positive on health - from eradication of micronutrient malnutrition to addressing the scourge of the chronic diseases.

Overall Partnership Development

Chris ROWLEY

Horticulture Australia, Sydney, Australia

My presentation is about industry partnerships. Partnership is a word that keeps recurring through all the sessions and I will provide an overview of the importance of partnerships; give some examples of partnerships that have worked in the context of the Australian campaign and provide some encouragement on how to work on these partnerships.

Woody Allen said *“Eighty percent of success is showing up”*. This is a key point because when start the process of developing a F&V campaign you look around the large numbers of potential partnerships that need to be developed and while it can be daunting, you need to start enthusiastically.

As I said partnership is a common theme throughout this Summit and there is a real need for health practitioners, retailers, wholesalers, agents, growers, government and health bodies to work together to achieve success. Previous presentations have already shown some of the partnerships that are required to build campaign momentum. What is required is to examine ways to develop and build strong leadership and commitment in order to try and sustain a long-term approach to changing behavior. The first step is to take a deep breath! Exhale and then move on to identify the key stakeholder sectors that can be involved in your overall campaign framework.

“The beginning is the most important part of the work.” -- Plato, Philosopher



Step 1 – take a deep breath

Step 2 – exhale

Step 3 – Identify stakeholder sectors

Produce industry
Non-government organisations
Government (health, agriculture, education)
Community
Education
Research



The beginning is the most important part of the work. - Plato, Philosopher

I commenced in my position of Health Initiative Coordinator for Horticulture Australia some four years ago. If you look at the horticultural industry it can be very complex to understand the relationships; very complex to understand what motivates the various sectors and to understand how to productively drive relationship with government, health bodies and with non-government organizations that are required to make the campaign a success. To build partnerships you need to look through your stakeholder sectors, you need to look at your industry and to examine what the non-government organizations are able to do in the marketplace. You need to look at your resources and where you need to be working cooperatively and you need to determine ways to talk to your elected government.

To build effective partnerships sounds very basic but you need to look at what currently exists and to build on these relationships. A good starting point is to try and map out the current situation and to see what organizations are already involved or that could be involved and to work from the situation and make contact with organizations; talk to other people and essentially start the communication process.

For partnership to work effectively we found that they need to be formalized where possible - whether it is a informal agreement or license agreement - just to ensure you are both committed to the process and are "playing on the same field". Partnerships need to be sustainable and you need to look carefully at how they can be sustained over long-term. They also need to be focused around the organizations themselves, rather than on any strong relationships that may exist with a particular person in the organization. And you need to be able to embrace collaborative competition whereby the various organizations are able to work collaboratively and yet continue to develop their own way of supporting the campaign in competition with other organizations. Each of the partners needs to find their own niche, but still work collaboratively in a way that not only allows them to achieve their goals but also helps to drive your campaign message.

The requirements for partnerships are essentially the following: a common shared vision - and when you begin your initial planning you need to find what this vision is an importantly you need to formalize it and know exactly where and how you are going to drive it forward. There should be a mutual need and the ability for shared decisions whereby you involve organizations and people in a way that they feel part of the process and part of the campaign. And you need to make sure that there is a benefit to them in helping you to drive a campaign message.

Flaming enthusiasm, backed up by horse sense and persistence, is the quality that most frequently makes for success. - Dale Carnegie

The key word here in the development of partnerships is persistence; you have to be persistent in developing the right partnerships and you need to be persistent in going back again and again and putting time and resources into the development and maintenance of the partnership.

I will give you some examples of how the campaign works in Australia. The Go for 2&5® campaign works through a partnership between the Western Australian Department of Health, other government bodies and industry.



Go for 2&5®

- **Intellectual property owned by Government**
- **National framework to allow private sector access through a formal licence arrangement**

Over five years ago a number of State government Health departments looked at the outcomes achieved by the Go for 2&5® campaign in Western Australia. At the time the Western Australian Department of Health had measured that the campaign had increased consumption of fruit and vegetables by one serve per person per day over a three-year period of the campaign. The evaluation showed that the campaign was a great return on investment and as a result all the State governments in Australia decided to embrace this campaign.

Within Australia the State governments already shared information so the decision was taken to establish a formal process to provide access to the campaign materials. A licensing process commenced and at the same time the Australian government formed a group called the Australian Fruit & Vegetable Coalition to bring together representatives from government, industry, retailers and non-government organizations to discuss the development of a national framework that could support the campaign by formalizing some of these partnerships. Through that a national framework was built around the sublicensing of the campaign materials.

Under the Go for 2&5® campaign the intellectual property is owned by the Western Australian Government, with a national framework that allows the private sector access to campaign materials through a formal license arrangement. Within this structure the government to government relationship has been maintained and a decision taken for Horticulture Australia - any industry-based body that undertakes

research and development and marketing on behalf of industry bodies - to manage the private sector component of the campaign.

The decision to use Horticulture Australia was taken on the basis that within this organization there are some 27 industry members already involved in the production and marketing of fruit and vegetables. The structure was developed to capture the involvement and imagination of these horticultural industry bodies that already interact with retailers, with wholesalers, with transporters and with markets. The licensing process has been in place now for around two years and we have some 20 sublicenses and while we have not managed to expand this as far and as wide as we would have liked it is a start and we will continue to work on some of those relationships to further develop the campaign.

One of the benefits of the licensing structure is that it has opened up campaign access to the private sector. The private sector often comes to government saying they would like to work to support the Go for 2&5® campaign and asking if they can co-brand campaign materials and resources. The licensing agreement can formalizes these relationships and provide for the sharing of resources. The way that Go for 2&5® was established was that government bodies - many of whom are already shared resources - submitted new campaign materials back into the pool where they can then be used by other sublicenses. Under this process a government health Department could develop a new resource such as a radio advertising campaign. The campaign materials would be returned to the central pool and could be used not only by other government bodies but by commercial sublicenses. We now have some retail stores who take the campaign posters and other point-of-sale materials that have been developed by government and rebrand them, making modifications that allow them to work appropriately in their environment.

The license structure not only allows resource sharing but also assists in leveraging activities. Within Australia there are a range of State government campaigns happening and commercial sublicenses can leverage from these activities; they can co-brand campaign materials; they can establish partnerships with government or with consumers buying their products. So the licensing process helps leverage activities and strengthens the common message.

Through this approach we are essentially seeing a two fruit and five vegetables per day message gaining a very high 90 per cent plus recognition rate. The establishment of a licensing process allows us to reinforce the message by establishing partnerships that deliver the message in a range of different settings.

In 2006 when we were looking to develop a national structure we held a number of workshops throughout Australia in conjunction with the Western Australian Department of Health. We worked with Christina Pollard, who was the person

responsible within the Department of Health on the development on these workshops to determine how best to proceed. Essentially we pulled together representatives from all the sectors that we thought would be interested in developing campaign partnerships. We had government, industry, transporters, non-government organizations and bodies interested in promoting good health. It was a very interesting process.

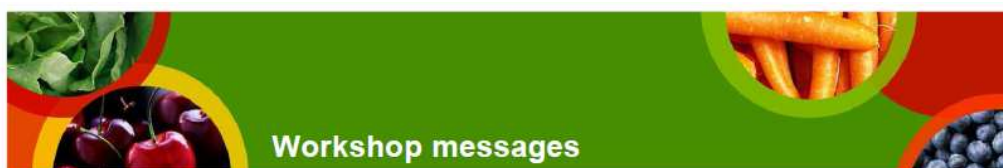
The biggest difference to come out of the workshops was between the government, non-government organizations and industry. At the very first workshop we held we had government all on one side of the room, discussing their hopes for the campaign and industry and non-government organizations on the other side of the room doing the same thing. In response to the issue of funding the campaign the government representatives looked at it very simply - horticulture is a \$6 billion industry in Australia, so their suggestion was to place a levy on industry to fund the Go for 2&5® campaign. In response to this the industry table jumped up and said no - because a levy would take away some of their profits.

The difference of opinion is that government would like people to eat more fruit and vegetables and if they could reduce the price or give it away to achieve the two serves of fruit and five serves of vegetables needed in Australia, then they would do it. Industry wants and needs profitability in order to maintain supply. Somewhere in the middle is where we need to go with the partnerships!

Again, unless we have that conversation and develop that understanding of what motivates organizations we will find it hard to develop appropriate partnerships.

The other thing we found in our workshops is that in Australia at the government level the departments looking after agriculture and health do not necessarily talk to each other as much as they should have and again it is part of the partnership development process to try and get them to communicate more effectively with each other about issues surrounding the production and supply of fruit and vegetables. Essentially the agriculture sector says there are significant health benefits in the government investing in the Go for 2&5® campaign, while government views the equation that increases in consumption equals more sales and so the production sector should pay for the campaign. What we are trying to do is to find a partnership that can work for both sides and to keep driving it as hard as possible. It is not that easy to do but you need to start the conversation somewhere and commit to developing appropriate partnerships.

Some messages that came out of the workshops include the following:



“To be effective requires strong partnership between industry, government, wholesalers and others in the production, distribution and marketing chain.”

“We can do the job better if we are all in their supporting the same campaign.”

These sorts of quotes sound great however you need to work hard to convert organizations from a position of philosophical agreement into a strong, cooperative working partnership:

“There is a need to look at the business of promoting fruit and vegetables and to work together collaboratively.”

“A lot of programs and partnerships already exist and we need to build on those.”

Again, these quotes are essentially all providing support for the campaign, however they do not illustrate the hard work that is required to develop the necessary partnerships and practical support for the campaign.

In Australia if you heard an organization say that what was needed was a national campaign to help drive consumption up by an additional one serve of fruit and vegetables per person per day, you could easily talk to them about the Go for 2&5® campaign and point to the results already achieved. The likely response would be that the Go for 2&5® campaign is someone else's campaign and that it is a government campaign or that their competitors are involved, or any number of reasons why they could not directly involved in the campaign. To be successful you need to continue to work on these people and to get them back into a productive partnership.

The fact is that they can exist under the campaign umbrella and they can exist under a strong partnership arrangement and work as part of an overall equation. When you think about Horticulture Australia it would certainly appear as an easy option to develop partnership arrangements - after all there are 27 member bodies under Horticulture Australia that could directly support the Go for 2&5® campaign

message. In fact only about 10 of these membership bodies have actually taken up a formal involvement with the campaign message and integrated it into their marketing activities.

It is difficult to determine the correct way to work with the many industry bodies that should be involved with the campaign. It takes time, persistence, energy and strength to keep developing these relationships and to maintain a cooperative approach to deliver the campaign.

You need to keep in mind a comment attributed to Margaret Thatcher - "You may have to fight a battle more than once to win it."

The important thing is that when you do get an on-board they help to legitimise your campaign messages; they help to leverage significantly the campaign voice; they provide access to different networks and may help to build campaign brand recognition. One of the Go for 2&5® campaign sublicensees is the Dieticians Association of Australia. Formalising this relationship provides industry with the opportunity to deliver campaign messages to health professionals across Australia; it provides the opportunity to tell these health professionals what industry is doing and allows them to work cooperatively with them to help drive the message. It provides you with another avenue to essentially legitimise the campaign message.

There is never a better time to start building and strengthening partnerships than right now. Once you get on this road, it is a long road, you just go keep walking, keep talking to people. No one has developed all the partnerships they all needed to develop.

Every meeting you go to you will find someone that makes a suggestion, a very good one that involves building a relationship with another group or another organization or someone else that can support your campaign message. You just need to keep your eyes open for it. They are unlimited opportunities for these campaigns, what we are limited with is resources, dollars, people on the ground, all those sort of things. Do not get frustrated about the lack of resources but just keep trying to look for ways to maximize what you have got, develop the relationship that you can and keep working and keep focusing on what you are doing.

My last quote is one that you need to remember daily:

"Don't judge each day by the harvest you reap, but by the seeds you plant" - Robert Louis Stevenson

Our campaigns are about planting the seeds for long-term sustainable increases in fruit and vegetable consumption. Go for 2&5® is not different to 'More matters', or

to '5+ a Day' or to any other campaign around in the world. It is all about planting the seeds, getting it going and developing the right process.

The approach of IFAVA with the toolkit is the same sort of thing; it is about providing resources that people can use to expand their own campaigns. We need partnership with other organizations, we encourage partnership with us and we need to provide resources. Around the IFAVA table there is a lot of experience, a lot of knowledge, a lot of information that can benefit people and the toolkit is one part of that. It is not the ultimate solution, it is simply providing good information on what can be done and I encourage you to use it.

What is the toolkit?

Ron LEMAIRE

Canadian Produce Marketing Association, Ottawa, Canada

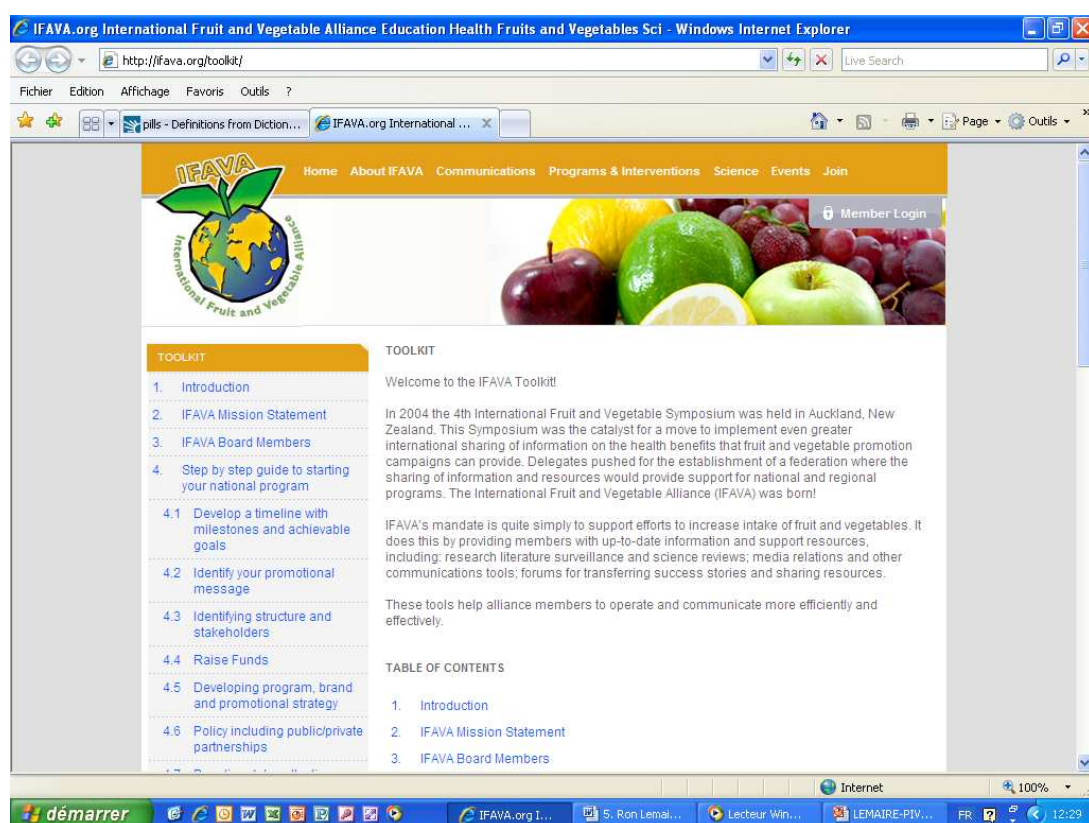
We heard three presentations about what key elements you need to incorporate into finding success within a 5-a-Day intake program. The next question is what is this practical toolkit?

The toolkit was based on some of the best strategies and some of the experiences of key members within IFAVA and other groups that we have found globally. The key elements have been broken down in a very step by step approach. This is a practical guide we have to remember. Looking at it as a scientific based document is wrong, we pulled case studies, letter reviews, information that can support the development of a program but have not been scientifically reviewed. But it can help you develop your program. We receive call at IFAVA as well as other organisations asking the core questions: how do I develop the brand strategy? To answer that question you have here some information from E Pivonka, you find more within the toolkit and what this dynamic tool can do and how we also want to expand the tool. If you visit the site and you see what you find and you see other areas commit it to IFAVA by sending us an email and we will look at it ensuring that we can pull pieces in maybe missing to ensure that it is a living breathing document.

It is a step by step starting guide. We break down what our mission is and it you have any interesting touching base with the IFAVA members you have that chance. Then, breaking in down into the key steps that are the steps after looking at successful 5-a-Day programs that we felt were the core elements of a successful program. First and foremost it is another timeline with milestones and achievable goals. You have to start at the beginning to ensure you understand what is in the market place even to establish your brand. Similarly you do establish your program even you get to a brand, you have to touch on some of the key goals and objectives that you want to achieve as an organisation and as a focus for your program. The next core step is looking at identification of your message. J Badham touched that perfectly by saying you have to understand what your market is but every message in every market will be slightly different and it is interesting. You had wonderful presentations at the New Zealand Conference in 2004 by a brand strategist who was looking at international brands and positioning very simple message. Nike, Coca Cola, they are



international brands and they established the same brand, the same message within the markets that they are going, the same icon, the same or similar brand identity where they go. You should be doing this for the F&V industry. We are a different breed, it is hard to go into Hungary or go into US or Canada, New Zealand, Australia and position the consumption message that would fit the needs of the diversity and the cultural aspects of how we eat. What should be all of our eating habits and attributes to it? We have seen a lot of document to that in all of our presentations seen along the Summit. So identifying your message is key to what we do in a 5-a-Day intake message especially around the fact that we do little funds and supports through in many cases volunteers and a lot of efforts. Looking at key stakeholders and identify the structure of how and what you want to work is vital. The way the site is structured is that it provides you with a one page quick overview of the topic line and then gives you the case studies in appendences so that you actually pulled the documents. To give you an idea of that structure, on the front page you could click on get it started to move into the toolkit. The page breaks down the four core areas. When you go into brand development, what you see is a quick, short overview of what is the topic line around brand development with examples from some of the various countries touching on very basic concepts around brand development. As we move to the base of the page, we have a list of appendices. This is where the notice and boards of the toolkit can be found. The introduction page is two pages of support material that set the work for what the topic line is and the goal is to provide support documentation that show practices and case studies that have been done around this area. Looking at the messaging around the brand development, presentations of the sessions are also included in this web site as well.



Going to core areas, another good example is that we heard a lot about policy and especially looking at what do we need to move forward in developing policy. Again, breaking down what the policy vision is and then the core appendices. IFAVA hosted a pre-workshop on school base programs which was a stepping stone for the meeting that occurred with the key stakeholders from 5-a-Day type programs and industry with the commission on talking about the European based type program. This information of that pre-workshop can be found on the section of the site which talks around what are the core elements you need to focus on about policy. To build political support for expanding programs, we work closely with government, as chair of IFAVA, I represent all 5-a-Day types group but as my day job I work with the Canadian Policy market associations. Some are like Horticulture Australia, although associations do not represent primary producers and from the farm get on right to the consumer so move through this all supply chain. We work closely with government health and agriculture and I find interesting to see quite of the same thing whether it is in Canada, Australia, New-Zealand etc. we are dealing with the same issues. We love working with our strategic partners but the issue of working within a government context that is a global phenomenon. Trying to break bridges we see a great change in shifting in this over the last few years and we will be seeing greater change in the future because governments are realising that there is a greater need to connect between health and agriculture. And even beyond Health and Agriculture, depending on your structure, moving towards working with federal bodies to municipal agents...

So we have a lot of hope within our tunnel. The goal is taking some of the insights that you can find on this toolkit and leverage it and pushing it so that hopefully it can move more quickly.

Political will is a key. For the 'Food Dudes' program, the program truly launched and drove forward once there was political will established and it came after a few years of very hard work and we were talking about building partnerships. Until the Minister of Agriculture said they should be a lead. It is a key to see how you get of generating political will. This section of the site can show some examples of what has been done within the US context and others to stimulate that political will on trying move in a strategic way to have politicians and have governments see the rational behind everything you have heard in this conference. Breaking down increasing awareness of programs for childhood for example, when you read you think it is common sense because it is so simple and you think you should have been looking at that on your basic program but hopefully through the tool kit a lot of these common sense practices can be pulled into a conceived document for your own national programs.

Just to give some examples of other areas, Program Launch is a key and bring this up is a good example that this is a living breathing document. We have two appendices break down on program launch but there is so much information when we were starting pulling the information together around what do people do to launch their program it was overwhelming. It is an area that we are currently developing and we

will be adding it into the site over the last month of 2008. Again as another good example, visit the site and continue to visit the site because it will continue to grow, to develop and continue to give you practical tools and elements that hopefully help you develop programs on a national, regional and hopefully at some point at a global level that can drive our consistent view forward within the global market place. One area on evaluating your program with a lot of examples, this is one of the biggest gaps of 5-a-Day type programs of program evaluation. We heard some discussion around the need for doing this; we all do evaluations that fit our needs in our market. In the Canadian context we break our analysis down on not only consumption but we also do our analysis on success on brand awareness and it varies depending on the country you are in. The key for us on how this toolkit is moving forward is ensuring that we meet the needs and the multiple evaluations that are happening globally and again vast information out there we just have to pull together so it is usable at this point because it is so vast. Another element that we have to look forward as a international group to ensure that we are working together to ensure we have evaluate process, be able to show our core partners within governments and other key stakeholders that these programs do work and that we do have success on increasing consumption for better health.

Q&A

PUBLIC (Gitte Laub HANSEN from the Danish Cancer Society): I have a question for Elisabeth Pivonka. I was wondering, you are changing your messages, isn't there a risk that you could be accused of changing messages all the time? And secondly moving from the more instructional message what you actually should do you should have 5 to 9 a day and a more loose message. Isn't there the risk that people tend to misinterpret the message and actually not increase there daily intake if there are not able to measure it? And third, isn't there a trend that you are reluctant to give unpopular messages for the public? If the message is not too easy to cop with, you would not easily give it to the public. You tend to please them and say just eat a little more and it will be fantastic instead of saying you need 5 a day or 10 a day whatever. What do you think?

E PIVONKA: Those are all excellent questions and in fact there are all questions that we have discussed over the past couple of years and in fact Christina (from Australia) and I have been talking about a lot here at this conference. To your first question about a changing message, we are actually having that problem prior to our Fruit and Veggies More Matters messaging. We had '5-a-day', we had '5-to-9 a day', '5-a-day the colour way' and we had several states that had the wrong messages. This was an attempt to have everybody the same message and quite honestly with a little bit of a less in branding, in that, what everybody wanted to do was to develop targeted messages to an audience but we were changing it in the logo. This new

brand is more of an umbrella so that we can create targeted messages in campaigns to an audience. And toward points about Nike and Coca Cola, if we had control over all F&V and if we had a budget, we could have a worldwide brand and everybody would have targeted messages for each of their country but we do not have that so we do have to do it a little bit differently. Because of the economics we often have to have messaging in the brand as opposed to just a look. If we had advertising more of the messaging would be in the advertising and the logo would be assembles of that advertising. So part of our effort was to get rid of all of our different messages, have an umbrella so that we can have individual campaigns without logos so much but messages underneath that umbrella. To your second point about instructional versus a loose message, Christina says that they believe that there are some research in this factor about the fact that far away people think they need to do more and I do think that there are some value to that. Before our research we found that people felt like it, they were too far away, they just gave up and there is some concern with that because if you do not think you are close at all you just tune out the all message. We do still provide the information if they want to know how much, it is on our website and when I talk to the press in fact my message is not so much servings now. When the press asks me what should we be eating, how much we should be eating, my message is literally half of what you eat should be F&V so half of your plate, half of your breakfast, half of your snack, that might even be an easier message but to have the quantity in the umbrella was rather limiting especially in our case when the dietary guidelines change every 5 years.

R LEMAIRE: To comment on that, many countries are moving to this direction and fortunately for the dietary guidelines, unfortunately for the messaging, Canada is in the same boat. When the US went through on their new pyramid and a more targeted approach, Canada followed shortly after within what we call our 'rainbow'. We were basic '5-to-10' message and actually our brand was over 50% as well for 5 to 10 a day for better health we still have it as a core brand. But our challenge now within our national dietary requirements we are targeted to age and gender similar to the US model, not as complex. So, as a male under 50 but over 20 I would eat 8 to 10 servings a day, very targeted it gives you a focused approach but how do you message that? Because now you 5-a-Day message does not function because for my age demographic I am 8 to 10 so a 'More Matters' message gives you that flexibility as E Pivonka identified to create your brand. You are no longer dealing with a logo that can convey a statement, you are dealing with a brand that I conveys a feeling and feeling has sense in fell of what it is to eat F&V and then behind all of that and the support, is the messaging in your market that you can tailor what are your states, what are your individual, your core target groups and the true essence of a brand is beginning to blossom and really comes to impact change in consumption. And that is where we need to go eventually we all of these icons we are seeing in the market. We have to find a way that these icons move from logos to brands.

C ROWLEY: The important thing here is that can be evaluated I mean when E Pivonka is going to run this 'More Matters', it is going to be evaluate, we are all going to see if it works or not. The point of whether having numbers or not, when people think they are far away and all of a sudden back off has partly been addressed in Australia to the campaign. The first campaign, the '2&5' campaign was an awareness campaign, 2&5 F&V target. The second one was an encouragement saying people are half way there and an easy to way to try to get a bit closer to the target. So you have to be careful the way you put that message but the key thing from a learning perspective is whatever we are doing, we are going to have to evaluate it and see what work and what work in your market. In 5 years time I hope 'More Matters' would have gain from that and we could all learn from it. In the future the '2&5' program might have a 'More Matters' approach, we do not know, it is an evolution. So I do not think there is a right or a wrong answer to it. Christina had some discussion because she feels that maybe there is some concern that it might work and in this trying context. Time will tell but I think it is interesting the '2&5' works well in the Australian context as we do it trying to encourage people and give them solutions, 'More Matters' might more work in the US context.

E PIVONKA: I might add that it is interesting that the industry really like this approach. The only people we get questions from are more the researchers, more the intellectual, people who like the factual information but the industry, in particular the supermarkets really get this and understand it and agree with what we are doing. So what it worth we do not know and will also say that, unrelated to your question but, in terms of evaluation we did evaluation, we did the awareness piece of 'ear to ear' because that was less expensive, we used government data set for the first ten years which take forever. So we do not know what consumer are eating 7 years after they measured it. Once we have a little more founding we started buying a different set that is much more immediate but it is very expensive so we are only measuring that about every 3 years and we won't see the movement on the government data set or our 3 years expensive data on consumptions. My point is that I do think that with 5-a-Day we were making some movement in consumption and in some audience we just did not know which these specific audiences were. So, evaluation is important and we were doing evaluation, we just did not have a targeted enough audience specifically to measure and given that it tool so long to measure the consumption piece of it we should have had a more targeted audience right from the beginning and we did not do that. It is probably a lesson learnt from our point of view.

To your third point, being reluctant to give an unpopular message, this is a discussion that we had earlier on in the 90's when we started a whole 5-a-Day campaign and that was a philosophical, how do we go out with our messaging. And we could have bashed donuts and we could have done all of these things. Our fear at to time was they had more money that we do and we were not ready combating commercials where they put they nose up at broccoli and they suggest that you do this instead. So there was a little bit of not wanting to rise rankles of some of the

other food groups. That was in the past, we haven't had those discussions so much over the past 5, 6, 7 years and I think it is something that we are more willing to look at now. The substitution message is an important one that we have not played up enough but it is something that we have discussed playing up more and we probably need to do it sooner than later. I think the impact of these kinds of messages does not have to be the logo message itself. So could even put numbers if we wanted to.

PUBLIC (From American Cancer Society): One thing that has been really helpful to our organisation about this looser message if you will is from a Cancer perspective our recommendation based on the science of F&V in cancer is still at least 5 servings. We support the federal government recommendations that you need for overall health and based on age under calorie level you need more than 5 a day but when we talk to Cancer specifically it is 5 a day much in the numbers of our partners but what we have been able to do in our programs, in our materials, in some of our messaging because there is not a number titled we can incorporate that more language quite easily into the things we do. So it has been really helpful for us.

J BADHAM: I will just add something from a developing country perspective because our department of health will come with our food based dietary guidelines of 'eat plenty of vegetables and fruits' and the research had shown that people had a clear understanding around plenty. It was quite interesting that when we started 5-a-Day we had the opportunity to change the messaging because we already know the US was going this route and we did our research. We found conflicting research in our government, we found that people felt that they did not have enough guidance with plenty and therefore they thought what they were eating now was maybe enough but they could do a little more whereas when we actually gave them the 5-a-Day goals, across all communities from more developed to under developed the goal as a new campaign was something they liked. So without having the science behind me to able to say for the moment but I think this move with starting with a number and setting a goal and then moving to a more 'More Matters' type message, I think it is the way that will find the research showing us the way communities move. But it was interesting that 'plenty' our government felt was fine but our research showed they wanted a number.

PUBLIC (Martine INDAMEU from France): I have a question concerning the use of the 'Fruit and Veggies more matters' logo and tag line, is this going to be localised for different countries? Is this going to be in Spanish, in French, adapting to the culture? And just a comment concerning the presentation from J Badham from South Africa, you have pinpointed something that I think is crucial is the words in the guidance that we need. In France now since last march last year we have those messages at the bottom at the food advertisements and of them being "eat at least 5 F&V a day". It is a good thing because you are putting into the light that the fact that you need to eat those F&V but then on the other hand what is 5 a day? It comes to the question of

what is it? Is it 5 peas, is it 5 pineapples? So we have a message that is too generic somehow and we need to educate the consumers on how easy it is and that it should be all forms and that it is portions. I have developed some materials showing that you can actually have something that holds in your hands, the larger or the smaller you hand is the more adapted the portion is going to be. If you show them, if you send those kinds of messages throughout schools, companies and supermarkets it becomes obvious that the consumer can appropriate the message.

E PIVONKA: Our interest is the US market as the Produce for Better Health Foundation is a non profit organisation within the US. We interface with the federal government; we were incorporated in 91 to interface with the federal government as an interface with the industry because the federal government did not want to work with hundreds of industry members. Our main date is US, our intent is to keep it in the US. Now having said that we had discussions we were developing with both Canada and Mexico largely because the F&V industry would like one North American market in. So there were some discussions about possibly in the future converting it into French or Spanish but we would want, before we did anything, to make sure we did the consumer research before hand to make sure that is something that is interpreted the same way in those languages. Not to mention the fact that Ron Lemaire has a very program up in Canada and is not interested but bottom line is we do not have intentions of doing that I mean if other are interested they can go to the toolkit, see how we did it, and see if it works for you. I think a 5-a-Day program would probably work better under a broader message and it can be a campaign for children probably. I would have probably reversed it and say that it would be appropriate for many children not most adult because is the highest number for most adults. But to come back to your question we do not have the intention to go international.

R LEMAIRE: I just want to talk about the interesting point about the portion distortion discussion around it fits in your hand. We actually ran a program in Canada transitioning the 5-to-10-a-Day message targeting our campaigns. We started with 'it fits in your hand' simple message and your right, bang on; depending on the national environment you are in people have hard time understanding what a portion is. The hand concept is one that works very well. Linking that to colours as well for F&V is also a dynamic way. So, we also had a colour program which was similar to the US with colour as key and we combined the two with the portion distortion build in a hand full of colour which enable you to link health component as well as the portion distortion component. Again, back to some of the benefits around IFAVA a lot of this support is on the IFAVA website. If you are looking for any additional information around some of these concepts, visit the site within and contact the member for more information.

J BADHAM: I also want to comment in terms that it is the exact question we found with our launch 5-a-Day we used it as a big positive because we have actually been able to give a lot more media time to actually explain what 5-a-Day is. It is 5 of a variety of F&V. We have actually been able to generate a massive amount of discussion then that would not actually happen and it was unintentionally although we knew people wanted a message but to get eat 5 of variety of different F&V which start getting a difficult sub message. But as E Pivonka said we also do with the brand, the 5-a-Day is the over overarching message in brand and each of our targeted communications we always have a sub message whether is about variety or it is about portion size or it is about health benefit. So we use the 5-a-Day as an overarching and in each target within but we really got a lot of discussions and we hear people now talking about variety thinking they can have 2 fruits, 3 vegetables etc. so it is a lot discussions in the media which for us is always great because it is free publicity.

E PIVONKA: I can add to that you can see this is a great opportunity to learn from each other because at a time I felt like over the past 17 years that we were working on 5-a-Day that we spent a whole lot more time explaining what the serving was then getting people to eat more. So you have to wait all these pros and cons, it is great for getting media coverage but if we are talking about what the serving is 5-a-Day mind sound to people like a lot and once they know is not very much then the whole just explaining what the serving is, takes a lot of time.

PUBLIC (Mariano WINOGRAD from Argentina): Speakers always say time is now but I think that really this moment is particular. I insist because the increase of the prices of fats and sugars, this is something new. I remember in South Africa a discussion between Brian Silverman and Karen Lock where they said is the consumer and the other Karen said it is the politics. She explained the matter of the European budget due to promote non-healthy agriculture. In the summary session I would like to take two little moments. One was yesterday when a little man who spoke in French, I do not know his name, but he explained about the law to avoid tobacco consumption in public areas included in France where people did not like this kind of law. In Argentina it is the same, we are a country where we do not take care of laws but the tobacco prohibition was a real success. The other very important moment for me was today where Mister James explained the importance and the possible change in the European politics. Then the question is for E Pivonka. In America you have discussed about the Farm Bill and there is a group called 'Eat Healthy American Diet' that are showing why everybody agree that we need to eat more F&V and we are supporting cotton, tobacco, fats ,etc. I think that the moment is special for this discussion. We need to go on. The countries do not like that one country is politically more developed than the other and this opportunity is something to copy and to push to do lobbying in all of our countries. I would like a little explanation about what are the discussions in the Farm Bill?

E PIVONKA: The Farm Bill wrapt up last week after two years of discussion and after months of putting off and off they finally wrapt it up last week. The president beaded it around the house and the Summit had oversight of that ... so it was passed last week. Previous Farm Bills had less than 1% for F&V. It was largely the raw crops in the centre of the country that were getting the support and the subsidies. This goes round F&V did have more that they ever had in the past, over a billion dollars for the snack program. A billion dollars over ten years just for the snack program but is still less than the 2% of the Farm Bill so 300 billion dollars bill something like that and still less than 2% of it is related to F&V. Having said that half of the Farm Bill is for nutrition assistance program and mostly the food stand program and those people can buy F&V if they want but we do not know how many F&V they purchase. Part of our problem in the US is that the people who passed those bills in the Senate e.g. we have two representatives from each states and the states who are benefiting from the current and past 15 years of the Farm bills are already focused in the Midwest and the 20 states that benefit and 5 to 6 states that produce F&V. So the power is with the people who are receiving the subsidies and that is true in the Senate and pretty true on all of the people who are on the agricultural comity who makes these decisions in house. So we have that problem. I will say that something specific to our campaign that has been very helpful is sharing information. In Western Australia has just published, I knew that they were working on it but it was actually published this summer July or August where they were showing that paid advertising will increase consumption of 90% among the general population 18 and older and that kind of information is very helpful for us for moving forward trying to help build the case. It is a battle that we have been fighting for years; it has get better in the past 5/6 years because the special the crop industry has work better together as they go to Farm Bill. The Public Health Community is working together with the F&V industry better over the past 5 years than they had in the past. There is a whole lot more work that we can do, there are some other barriers as I say who ends up on the comity making the funding decisions. But, at least it is moving in the right direction.

One point to your energy piece is that in our Farm Bill discussions all of the people in the country who are receiving the subsidies now because prices are going up should not be getting any subsidies. They want the subsidies because they want to put it into research to become more energy dependent so there is not a reason to keep the subsidies that they already have. They are powerful, very powerful these other groups and they are powerful because they had some support earlier on.

R LEMAIRE: This is not only a US phenomenon. Same issues in Canada when we see fragmentation within the produce industry as a whole and it is one of our challenges as well as a political lobbies and E Pivonka touched on it. It is not as strong as many of those other groups such as grains, oil seeds and looking at dairy and so on. The success we can see there, we heard a little bit of it coming from Philip and we have seen some pieces come together comes back into the goal into bringing

together agriculture and health and try to create that better link between the two. More we push the link between Agriculture and Health on the F&V files and everything we have seen here in the Summit in one document presented to a combined comity on Agriculture and Health would go a long way within a national frameworks. It may not be a solution for tomorrow but it is a starting point. Back to C Rowley point, the beginning is the most important place to start. And definitely going back home is key to start thinking this way and pulling the information.

PUBLIC (ELIAS from France): I wonder how the partnerships with industry and producers are built for 'More Matters' brand. Is it economical, partnership or financial partnership?

Comment les industriels peuvent utiliser la marque sur leurs produits dans leur packaging ?

E PIVONKA: The grower or the manufacturer if they have done any processing can use it on packaging but CDC (Centre for Disease Control and prevention) sets the criteria by which the product can carry it on its packaging. There is a sodium criterion, sugar etc. we allow for nuts, all of this is listed in our brand guidelines on how you can use the guidelines. That is what we do with the producers. On the retail side we provide a toolkit for them with all of our logos and lot of messaging and they can use that in their ads point of sale signs in the supermarket and consumer fares directors for the supermarket who is spokesperson for the supermarket is used on the radio, they send mail to consumer so they use a variety of ways. I will say that I think fresh products used as much as I would like for them on the peel with a little stickers with little numbers scanning at the store. Not as many of them use it as I would like, I am still trying to push that. Most of the produce is promoted through the supermarket itself and some signs in the produce department. It is not until you put it on the package that you actually have a label. A lot of the fresh cut products use it on their packaging and caned and frozen, dried F&V use it on packaging as well. So that is mostly how they use it.

For the financial side, we are voluntary contribution organisation. On my understand in France there is more of a assessment and in fact that is why we were interested in part of what France has done in the past because they think that is an excellent model and it provides more resources so that you can reach the population. As we were looking at general population we were spending with our small budget 3 cents per citizens in the US. When you look at everybody we are up to about 40 cents per young mother now that we target our audience and maybe we can have an impact there. But it is all voluntary contributions. We also have a board of trustees made up of our major donors that represent about 100 of mostly the F&V growers, processors and some retailers.

PUBLIC: It is funny we were talking about tobacco because earlier I have been sitting here and have been in this room for hours this week but this was the first time I

noticed that this was an ashtray. For me this is the bottom line of what is this meeting and what are we all about. This may be easy for people to smoke before there was smoking policies and partnerships, working on these policies, working on the environmental changes to make it easy for people to eat more F&V, we do have a lot to learn from the tobacco industry.

Fruit and Vegetable Summit Proceedings



May 27-30, 2008 - Unesco, Paris

Presented by EGEA – IFAVA
Co-sponsored by the World Health Organization (WHO)
With the participation of the European Commission
With the support of the French Ministry of Agriculture
With the technical cooperation of the Food and Agriculture organization of the United Nations (FAO)

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ECONOMY SESSIONS
From agricultural economy to food policies and strategies:
How to promote F&V supply?

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SESSION 5

CULTURAL DIVERSITY, BIODIVERSITY AND TERRITORIAL MANAGEMENT

Chair: **B. Chevassus-au-Louis**

- Introduction. **B. Chevassus-au-Louis**
- The future use of plant foods. **Y. Lespinasse**
- The diversity of French F&V: ethnic market development and the emergence of ancient and new species. **M. Chauvet**
- Cultural and biological diversities: the need for a joined approach. **D Veschambre**

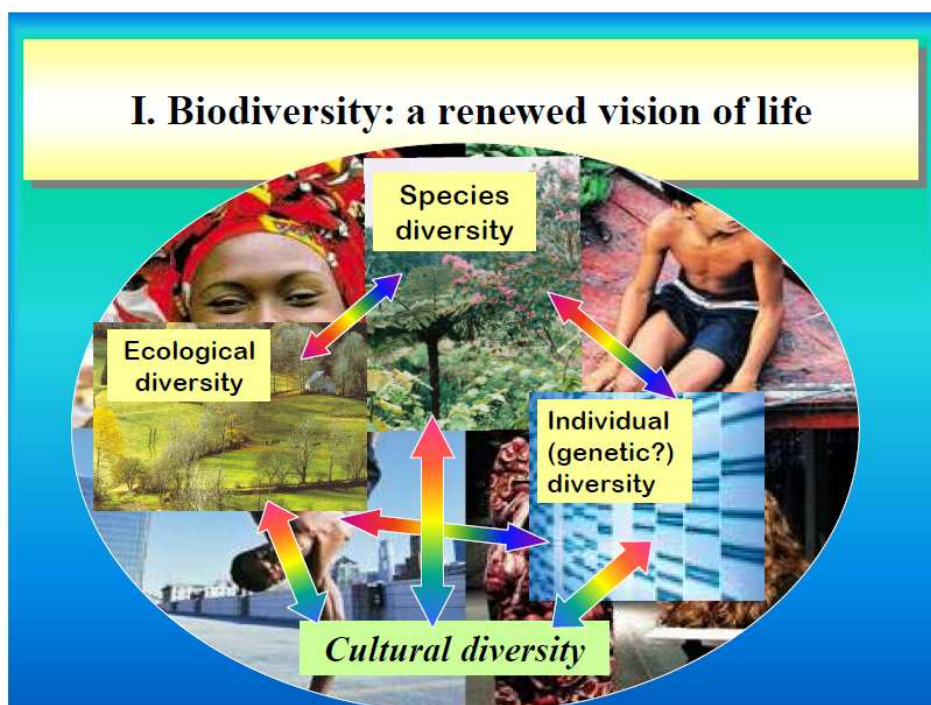
Introduction

Bernard CHEVASSUS-au-LOUIS

Laboratoire de Génétique des poissons INRA, Jouy-en-Josas, France

Nous allons commencer cette session sur les liens entre diversité culturelle, biodiversité et gestion des territoires. Je partirai du fait que nous fêtons cette année les 20 ans de la biodiversité, c'est-à-dire les 20 ans du mot biodiversité. Les deux points que je voudrais introduire sont les suivants : tout d'abord, on peut se demander si la biodiversité n'est qu'un nouveau mot à la mode ou si cette biodiversité traduit une nouvelle vision de la nature, ce qui est mon point de vue ; ensuite, je voudrais expliquer pourquoi les gens qui s'intéressent à la protection de la biodiversité considèrent aujourd'hui qu'on ne peut plus le faire seulement dans des espaces protégés et donc souhaitent que cette biodiversité soit gérée dans l'ensemble de ce qu'on appelle la nature ordinaire, ce qui introduira la question de la gestion territoriale et de l'utilisation de la biodiversité dans ce domaine.

Pour le premier point, à savoir en quoi le mot biodiversité introduit de nouvelles idées, je pense que vous êtes maintenant familiers avec ce schéma des trois niveaux d'organisation de la biodiversité, diversité des espèces, diversité au sein des espèces, qu'on appelle parfois diversité génétique (en fait c'est un peu plus large) et puis diversité des associations d'espèces, c'est-à-dire diversité des écosystèmes.

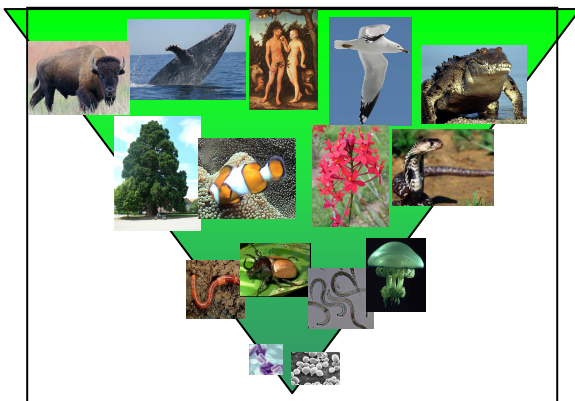


Mais, les deux points pour lesquels je voudrais souligner une nouvelle manière de penser sont les suivants : tout d'abord, le fait qu'aujourd'hui les interactions entre ces différents niveaux sont considérées comme tout aussi importantes que les propriétés

de ces niveaux considérés de façon indépendante. Cela signifie que la bonne gestion du « système » que constituent ces différents niveaux de biodiversité est considérée comme ce qui fera effectivement son intérêt, plutôt que la conservation de certaines de ses composantes.

La deuxième idée, qui a été introduite notamment par la Convention de Rio, c'est que, par rapport à cette diversité biologique, l'homme et la diversité de ses cultures, de ses savoirs, est extrêmement présent et que là aussi les interactions sont dans les deux sens, c'est-à-dire que la diversité culturelle a contribué à forger et contribue à la dynamique de la diversité biologique et qu'inversement les cultures et les savoirs de nos sociétés sont en partie modelés par cette diversité biologique. Nous en verrons des exemples au cours de cette session.

Quelques points complémentaires sur les différents niveaux d'organisation de la biodiversité et tout d'abord sur cette diversité spécifique, pour vous sensibiliser au fait que les recherches scientifiques des vingt dernières années ont complètement inversé notre représentation de ce que j'appelle la pyramide du vivant.

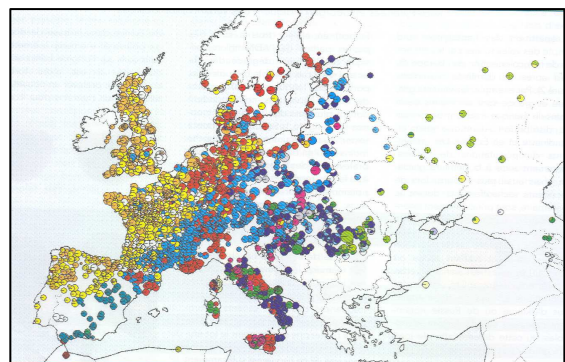


Vous avez ici une représentation dans laquelle j'ai mis en avant les grandes espèces animales et végétales qui sont souvent l'objet de campagnes pour la protection de la biodiversité. On peut dire que ces grandes espèces jouent un rôle majeur dans notre représentation de la biodiversité. Bien sûr on parle, mais beaucoup moins, des invertébrés, des petites espèces animales et végétales et encore moins effectivement des micro-

organismes. Or, les travaux scientifiques des vingt dernières années proposent au contraire une vision radicalement différente, c'est-à-dire que l'essentiel de la biodiversité vivante, tant en termes de nombre d'espèces que de biomasse ou de diversité, est constitué par des êtres unicellulaires et que les espèces auxquelles nous sommes attachés, dont la nôtre qui figure au sommet de cette pyramide, ne sont qu'une infime minorité. Ce qui veut dire en particulier qu'elles dépendent sans doute de tout ce qu'on appelle la « majorité invisible » pour continuer à vivre et prospérer. Donc cette vision de pyramide inversée me semble un point à bien intégrer.

En ce qui concerne la diversité génétique, Yves Lespinasse en parlera assez largement. Le seul point que je voudrais évoquer est le fait qu'elle est encore en grande partie à décrire, à comprendre et à utiliser.

Décrire tout d'abord. Je vous donne ce graphe qui représente l'organisation de la diversité génétique des chênes européens en utilisant des marqueurs génétiques. Vous



(Chloroplastic DNA, Petit et al, *Forest Ecology and Management*, 156, 2002)

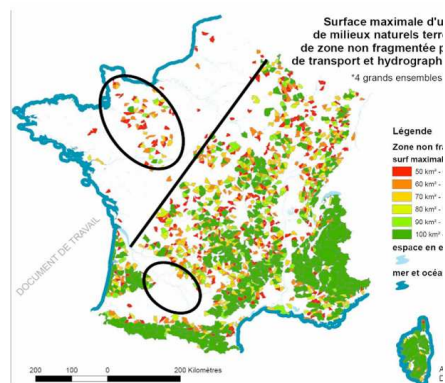
voyez effectivement que cette diversité n'est pas organisée suivant les frontières des états européens actuels. Elle a une organisation complexe et lorsqu'on voudra effectivement l'utiliser, par exemple pour transplanter des populations d'un endroit à un autre, cette connaissance de l'organisation de la diversité sera indispensable, et est encore en grande partie à acquérir.

L'autre point sur la diversité génétique est que, souvent, on en a une vision qui consiste à dire que l'on va pouvoir la « trier », c'est à dire identifier les génotypes intéressants et éventuellement les utiliser. Or, ce qui apparaît aujourd'hui, c'est qu'il y a tout une marge de progrès possibles dans le mélange intelligent de génotypes, ce qu'on appelle les populations composites. En particulier, des travaux récents sur les céréales ont montré tout le potentiel de ces mélanges de variétés pour permettre des productions à la fois conséquentes et une bonne résistance aux maladies. Autrement dit, cette diversité génétique est à réinsérer au cœur même des pratiques agricoles.

En ce qui concerne la diversité écologique, je voudrais également vous sensibiliser à l'idée que ce qui fait la diversité écologique n'est pas tant les espèces qui sont dedans mais les interactions, au même titre que ce qui fait la beauté d'un morceau de musique ne sera, pas tant le jeu des instruments individuels, mais leur capacité d'émettre une symphonie adéquate. Ce « concert des espèces » est justement lié aux points que j'évoquais en introduction, c'est-à-dire toutes les interactions qui peuvent se faire entre des espèces. L'exemple le plus intime de ces interactions biologiques est le cas des symbioses. Vous savez effectivement que toute une série d'êtres vivants ne doivent leurs caractéristiques qu'au fait d'être des symbioses entre espèces. Les lichens, qui sont des végétaux pionniers, sont en fait des associations d'algues et de champignons ; vous savez aussi que beaucoup de plantes ne peuvent fonctionner que grâce à un cortège bactérien qui leur permet de vivre dans des environnements parfois difficiles, et vous connaissez également l'exemple des coraux. Donc il faut effectivement avoir de cette diversité écologique une vision extrêmement fonctionnelle, ce qui veut dire en particulier que lorsque l'on va s'intéresser à la gestion de la diversité des espèces, on aura aussi à s'intéresser à des espèces qui ne jouent pas un rôle direct dans la production, mais qui sont des espèces auxiliaires qui peuvent moduler les propriétés d'un écosystème.

Mon deuxième point, pourquoi utiliser la biodiversité dans la nature ordinaire, me conduit à évoquer quatre aspects de ce qu'on appelle la crise des aires protégées. Ces quatre aspects sont liés au problème de la taille des aires protégées, à la question de l'effet des changements globaux, à une nouvelle vision de ce que sont les perturbations et leur rôle et, enfin, à la question de ces fameux points chauds de la biodiversité. En ce qui concerne la surface des aires protégées, les écologistes ont cherché à établir des relations entre la taille des aires protégées et le nombre d'espèces que ces zones peuvent abriter. La définition des paramètres de cette loi empirique amène à dire de plus en plus que la plupart des aires protégées, à long terme, sont trop petites. Pour résumer la pensée des scientifiques, on avait l'impression il y a 20 ans qu'en protégeant 15 à 20% de la planète on pourrait

conserver 80% de la biodiversité. Aujourd'hui on est dans un schéma dans lequel, si on protège 15 à 20% on conservera à terme 15 à 20% de la biodiversité. En conséquence, la question de la fragmentation des territoires revêt une importance particulière.

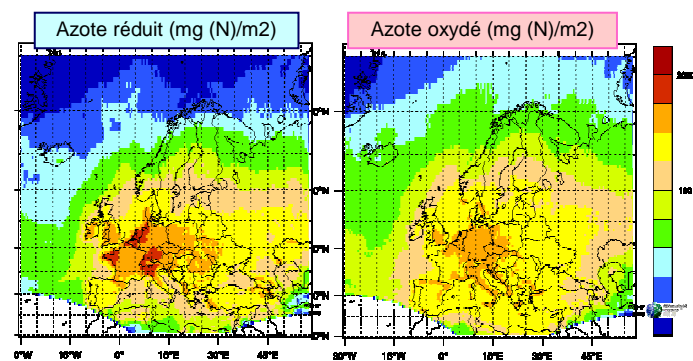


Examinons cette carte de France : là où il y a des zones vertes, cela signifie que vous avez des territoires de grande taille qui ne sont pas fragmentés ; le rouge indique que la fragmentation est déjà importante et les zones blanches sont des zones où il n'y a plus d'aires d'une surface suffisante. Vous voyez en particulier que le Nord Ouest de la France n'a pratiquement plus d'espaces non fragmentés, d'où les conséquences sur la capacité de

conservation des espèces.

Une des conséquences dont on discute beaucoup actuellement est l'intérêt de mettre en place des « réseaux écologiques », ce que l'on appelle aujourd'hui en France la « trame verte et bleue », c'est-à-dire le fait d'aménager les territoires pour assurer une continuité entre des zones d'intérêts écologiques. Ceci se traduit par des cartes appelées schéma directeur des aménagements écologiques, dans lesquels on souhaiterait relier des zones d'intérêts écologiques par des corridors, par des haies et donc un ensemble d'aménagements. Nous verrons tout à l'heure que par rapport à cette préoccupation, la production des fruits et légumes, la production des vergers et autres peut s'insérer dans cette logique de trame écologique.

Deuxième point, la question des changements globaux. On pourrait dire, presque par définition, que les changements globaux ignorent les espaces protégés. Je vous ai mis par exemple les cartes des pluies d'azote sur l'ensemble des territoires européens pour vous montrer que partout en Europe, que l'on soit dans un parc national où en plein milieu d'une zone agricole, il pleut des quantités d'azote qui peuvent être de 10, 20 voire 30 kilos d'azote à l'hectare.



Ces pluies d'azote peuvent avoir des conséquences tout à fait importantes sur l'évolution des végétations. Par exemple en Grande-Bretagne et en Ecosse, on voit se réduire les plantes des zones de landes au bénéfice de graminées qui apprécient et bénéficient de ces flux d'azotes. Par rapport à cela, la stratégie des aires protégées est effectivement inadéquate.

Troisième point important, les écologistes se sont rendu compte que certaines perturbations, qu'il s'agisse des inondations, des incendies, des tempêtes ou des pâturages dans des zones alpines, sont nécessaires à l'entretien de la biodiversité. Autrement dit, si on essaye de trop protéger les milieux, on observe que certaines espèces disparaissent. L'adaptation permanente de la biodiversité nécessite donc la poursuite d'un certain régime de perturbation. Cela met en défaut des stratégies que j'appelle « d'arche de Noé » : vous avez sûrement entendu parler de cette arche de Noé moderne mise en place dans une île du Spitzberg, dans laquelle on entreprend de conserver pour des périodes très longues des semences de plantes importantes. La question est : est-ce que dans 100 ans, ou peut-être 1000 ans, si l'on va rechercher ces ressources, se révéleront-elles adaptées à l'environnement de l'époque. Donc, on en voit bien les limites de l'idée selon laquelle on va extraire la biodiversité de son milieu pour mieux la protéger.

Le dernier point que je voudrais évoquer est la question des « points chauds » de la biodiversité, c'est-à-dire de ces zones du globe particulièrement riches en espèces, que ça soit Madagascar, l'Amazonie ou les îles du Pacifique. Je voudrais vous dire simplement, mais je pense que c'est intuitif, que ces points chauds ne peuvent être considérés comme des coffres forts pour la biodiversité. En effet, si demain, dans les plaines américaines ou européennes, on veut restaurer des écosystèmes, y réintroduire de la biodiversité, on ne le fera pas en allant chercher des espèces dans ces zones extrêmement riches ; il faudra le faire avec la biodiversité que l'on aura conservé sur place ou à proximité de ces zones cultivées. Cela ne veut bien sûr pas dire qu'il ne faut pas protéger ces points chauds, mais ce serait une illusion de croire qu'en protégeant uniquement ces points chauds, on a des ressources pour demain en termes de biodiversité, par rapport aux questions dont nous allons discuter.

Voilà donc une brève introduction à la vision que nous avons aujourd'hui de la biodiversité et de sa conservation. Pour terminer, je voudrais juste dire que si les stratégies d'arches de Noé ne sont pas adéquates, les stratégies « d'Arche de Noé à l'envers » ne le sont pas davantage. Ce que j'appelle l'Arche de Noé à l'envers, c'est l'idée d'embarquer l'humanité sur un bateau, en se disant finalement qu'on peut se passer de la diversité. Pour moi, ce bateau à un nom...le Titanic.

The future use of plant foods

Yves LESPINASSE

INRA-UMR GenHort, Beaucauzé, France

La diversité fruitière est encore très présente heureusement sur notre territoire et pas uniquement le territoire français mais aussi sur l'ensemble des pays européens. Un inventaire national des collections fruitières a été réalisé par l'association Danone pour les fruits voilà déjà quelques années. Cet inventaire montre une grande richesse des collections fruitières en France avec 359 acteurs, 253 collections, 39 000 accessions pour 21 espèces fruitières. Cet immense travail de recensement que l'on peut trouver sur le site www.patrimoinefruitier.org n'est malheureusement pas très bien valorisé et porté à la connaissance de tous. (...) C'est aujourd'hui l'Union Pomologique de l'Association Française pour la Conservation des Espèces Végétales (l'AFCEV) qui a pris la succession de l'association Danone.

Je vais prendre deux exemples de travaux réalisés dans les conservatoires français : d'abord je parlerai du Centre de Ressources Génétiques du Nord-Pas-de-Calais et du Conservatoire Végétal Régional d'Aquitaine mais il y a d'autres travaux qui sont aussi faits en particulier dans le Conservatoire Régional d'Espèces Fruitières Anciennes et de Vignes du Tarn. L'ensemble des collections est structuré en réseau avec le concours du BRG, le Bureau des Ressources Génétiques, de l'INRA et de cette Union Pomologique de l'AFCEV.

D'abord un premier exemple de création variétale en poirier qui va bénéficier de ces fameuses collections. Le Centre de Ressources Génétiques du Nord-Pas-de-Calais travaille en association étroite avec le Centre Wallon de Recherches Agronomiques de Gembloux à travers un projet européen INTERREG III qui s'appelle « Patrimoine fruitier transfrontalier et biodiversité » pour la création variétale en poirier. Ce travail permet d'étudier le patrimoine fruitier qu'ils conservent donc attaché à leur région au sein de parcelles non traitées afin d'en évaluer la sensibilité aux maladies. Les objectifs du programme de sélection vont être prioritairement : la faible sensibilité aux maladies, en particulier tavelure et feu bactérien, des qualités gustatives adaptées au goût du consommateur aujourd'hui, recherchées en tout cas par certains consommateurs, et des variétés qui vont présenter une longue conservation. Ce travail de création variétale à partir de variétés locales, étudiées pour en particulier leur résistance, choisies comme parent femelle et d'autres comme parent mâle, conduit à voir déjà en pépinière du matériel nouveau issu d'hybridation et qui va être sélectionné pour ces caractères que je rappelais, le plus important étant la tolérance aux maladies.

Le deuxième exemple, si on regarde ce qui se fait au niveau du Conservatoire Végétal Régional d'Aquitaine, il est tout d'abord intéressant de préciser à propos de cet exemple que les interlocuteurs sont des amateurs, des associations mais aussi des

groupes de professionnels qui s'intéressent à ce patrimoine et qui essaient de voir comment peut être modifié l'assortiment variétal et les modes de production. Les questions posées tournent autour de comment revitaliser les sols qui sont très perturbés depuis environ 50 ans du fait de l'application des herbicides et pesticides en général, comment vivre avec les parasites ou en tout cas comment réduire la pression parasitaire et éviter ce que l'on voit aujourd'hui du fait de la culture monovariétale, c'est très vrai en espèces fruitières. Nous avons donc une pression du parasite qui est maximisée de ce fait car en face du champignon parasite, par exemple, se trouve très souvent un seul génotype, une seule variété, ce qui conduit à diversifier les races du bio agresseur. Des questions autour de l'évolution variétale : (...) Quelle variété demain remettre au goût du jour et quelle variété créer ? Toujours ces deux questions : comment bénéficier des variétés héritées du passé mais aussi avoir une dynamique de création variétale. Enfin, quels systèmes culturels mettre en avant qui vont être économes en termes d'énergie mais qui vont aussi permettre de mieux gérer l'eau mais aussi, autant que faire se peut, éviter les pesticides.

La première question très importante, **comment revitaliser les sols**, est en fait comment retrouver des sols vivants (...) avec des champignons, des vers de terres,

**



des arthropodes, comment relancer la vie bactérienne, comment mieux gérer l'eau ? Je signale simplement que dans ce Conservatoire on évite les labours, on a des sols non retournés. Une expérience très intéressante qui est très peu connue, c'est l'épandage autour des arbres de Bois Raméaux Fragmentés (BRF), le terme anglais étant « Ramial Chipped Wood (RCW) ». A partir de rameaux, de branches d'arbustes ou d'arbres cela consiste à les fragmenter et les épandre autour de l'arbre comme

indiqué ici sur cette photo**. C'est une expérience qui a débuté au Canada, qui est très peu connue mais intéressante du fait de ces bois fragmentés –c'est une étude en cours- pour permettre de relancer la vie bactérienne, de revitaliser les sols arboricoles ; c'est vrai pour l'arboriculture mais vrai aussi évidemment pour d'autres cultures.

Vivre avec le parasite : comment faut-il procéder ? Est-ce qu'il faut sélectionner des résistances complètes ou bien des rusticités ? Voilà une question très importante qui est travaillée dans nos instituts dont l'INRA, nous sommes aujourd'hui face à cette question (...) de résistance complète. Vous avez ici une variété résistante qui a été sur-greffée sur une variété sensible, on peut voir l'intérêt de la variété résistante mais on sait aussi que la pression exercée par le gène de résistance sur le bio agresseur va certainement, et nous avons déjà la démonstration dans certains cas, permettre la diversification de races capables de contourner le gène de résistance. On peut citer par exemple le cas de la variété Ariane qui a été sélectionnée grâce à nos travaux à l'INRA qui contient le Gène Vf qu'on connaît de mieux en mieux car il a été séquencé récemment. Cette variété Ariane se développe et j'indiquerai comment cette nouvelle gamme variétale moins sensible aux parasites et donc nécessitant moins de

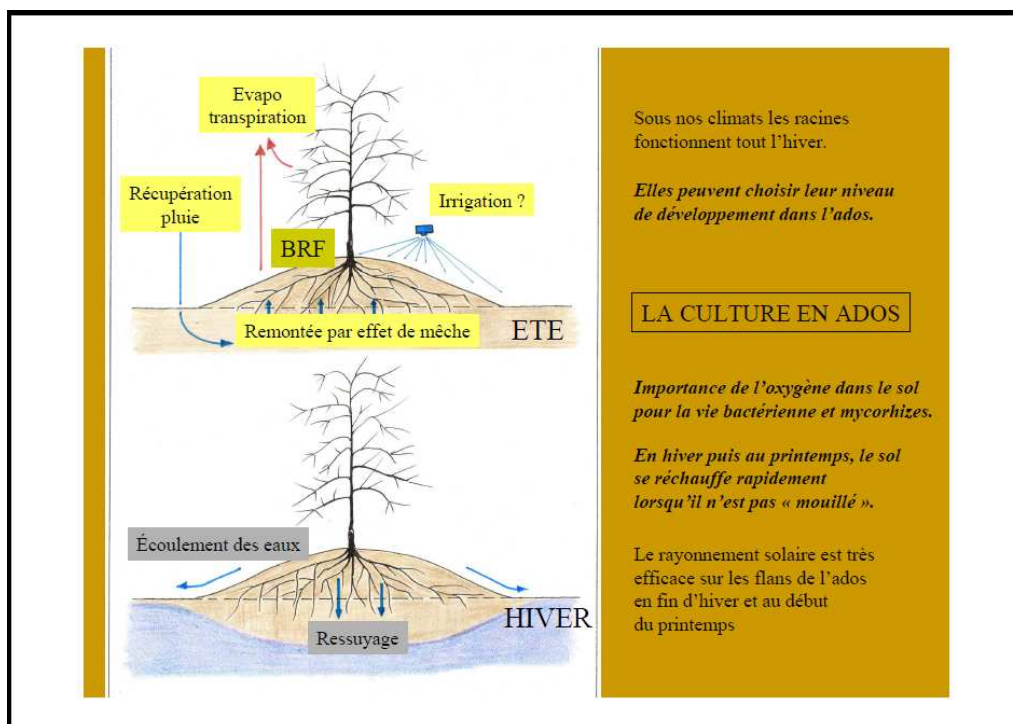
traitement phytosanitaire est promue pour que le consommateur puisse en bénéficier. À côté, vous avez une variété d'origine Basque, Anixa, qui a été, elle, sélectionnée sous la pression du milieu qui a en fait très peu de tavelure voire pas de tavelure. C'est un système génique inconnu jusqu'à présent, non caractérisé, mais à coup sûr très intéressant. Nous avons là deux approches qui ne s'opposent pas, bien au contraire, et qui doivent être complémentaires. Et grâce aux travaux de l'Institut de Recherche, grâce aux travaux de recherche fondamentale et grâce aux travaux faits au sein des Conservatoires comme celui d'Aquitaine, nous pouvons, à coup sûr, nous le pensons en tout cas, contribuer à sélectionner du matériel plus résistant, ayant une résistance durable, par exemple dans ce cas-là, au champignon parasite responsable de la tavelure.

La contribution des conservatoires va être évidemment d'étudier l'ensemble des variétés qui sont rassemblées dans ces sites. Les personnes qui font ce travail, qui sont en grande partie des bénévoles, vont étudier la qualité du fruit, le mode de fructification qui est un point très original et important et puis la rusticité aux parasites.

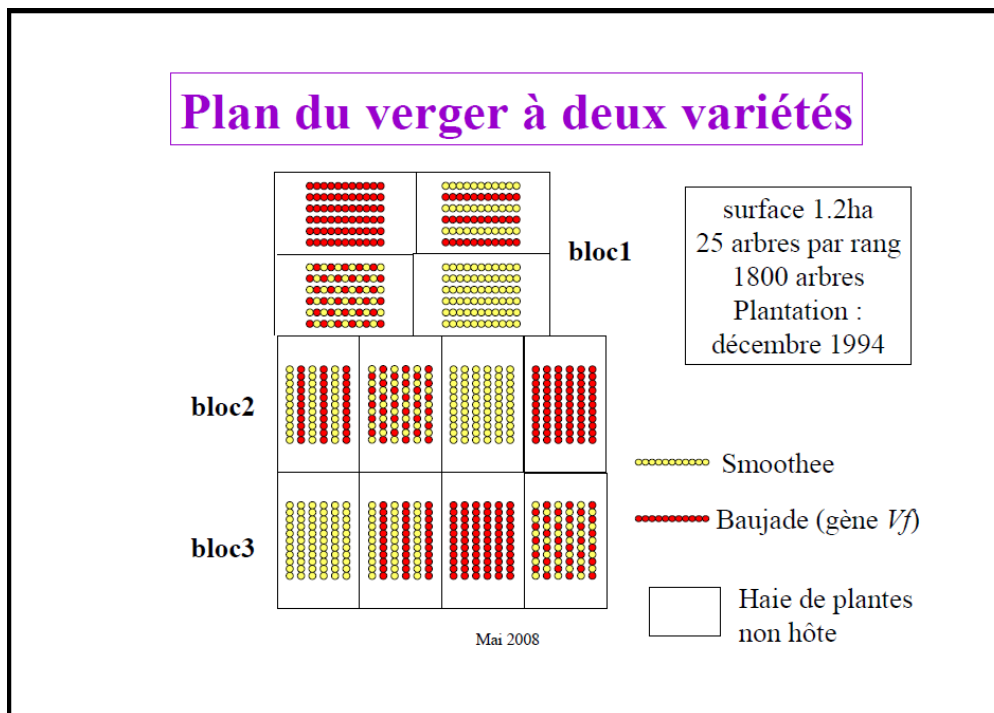
Quelle évolution variétale ? Quelle variété promouvoir ? Il faut quand même bien voir que l'assortiment variétal aujourd'hui en espèces fruitières est le résultat de la sélection de nos illustres prédécesseurs, exemple la prune Reine Claude, la poire Doyenné du Comice. La poire du Comice a été primée à Angers dans le Nord Ouest de la France en 1850 donc ce sont des variétés notoirement connues et qui sont d'origines très anciennes. Le travail de ces Conservatoires est de remettre au goût du jour des variétés complètement oubliées comme Roussane de Monein en pêche ou l'abricot de Nicole ou bien la prune Datil, des noms de variétés que les agriculteurs eux-mêmes ne connaissent plus, ont oublié et qui peuvent donc finalement donner une diversité à nos cultures fruitières tout à fait intéressante à condition bien sûr que la culture de ces variétés anciennes soit économiquement possible. Ces Conservatoires vont donc avoir un rôle, en particulier ici celui d'Aquitaine, de multiplication en grand nombre (ils multiplient chaque année 25 000 arbres d'espèces fruitières), un rôle de conseil non seulement auprès de l'amateur mais aussi d'associations voire de groupes de professionnels. Ces conservatoires ont un rôle éminent aujourd'hui : remettre dans les jardins des amateurs, et peut-être demain au niveau de certaines entreprises arboricoles, ces variétés anciennes, voire des variétés issues des programmes d'hybridation. C'est une conservation des variétés qui n'est pas statique mais dynamique. On va donc utiliser le patrimoine génétique qui aura été ainsi caractérisé en mettant en avant un certain nombre de caractères, par exemple le mode de fructification, pour éviter l'alternance de productions et les caractères de résistances aux parasites. Ce travail d'hybridation va se faire en concertation avec par exemple le Conservatoire du Nord-Pas-de-Calais. Les personnes en charge de ces travaux vont échanger leurs expériences. Suite aux hybridations, de jeunes plantes issues de semis de pépins de pommiers vont être semées en serre et vont être ensuite élevés en pépinières pour sélectionner de nouvelles variétés. Un exemple, entre Reinette dorée qui est une variété ancienne et

Chantecler qui est une variété issue de nos travaux à l'INRA, l'hybridation entre ces deux variétés a donné des sélections qui sont aujourd'hui étudiées, (...) un hybride en cours d'expérimentation avec justement une association de producteurs. Et, c'est un descendant de la variété INRA Ariane qui va peut-être demain permettre une diversification originale grâce à ce travail du Conservatoire d'Aquitaine.

Les systèmes culturels vont être aussi, bien évidemment, abordés. Selon un mode de conduites d'arbres tout à fait intéressant abordable par l'amateur, des recommandations vont être faites pour une culture en ados, de façon à mieux gérer l'humidité, en particulier en hiver, pour éviter l'asphyxie racinaire et pour avoir une très bonne aération donc mieux gérer l'oxygène et le redémarrage des racines au printemps.



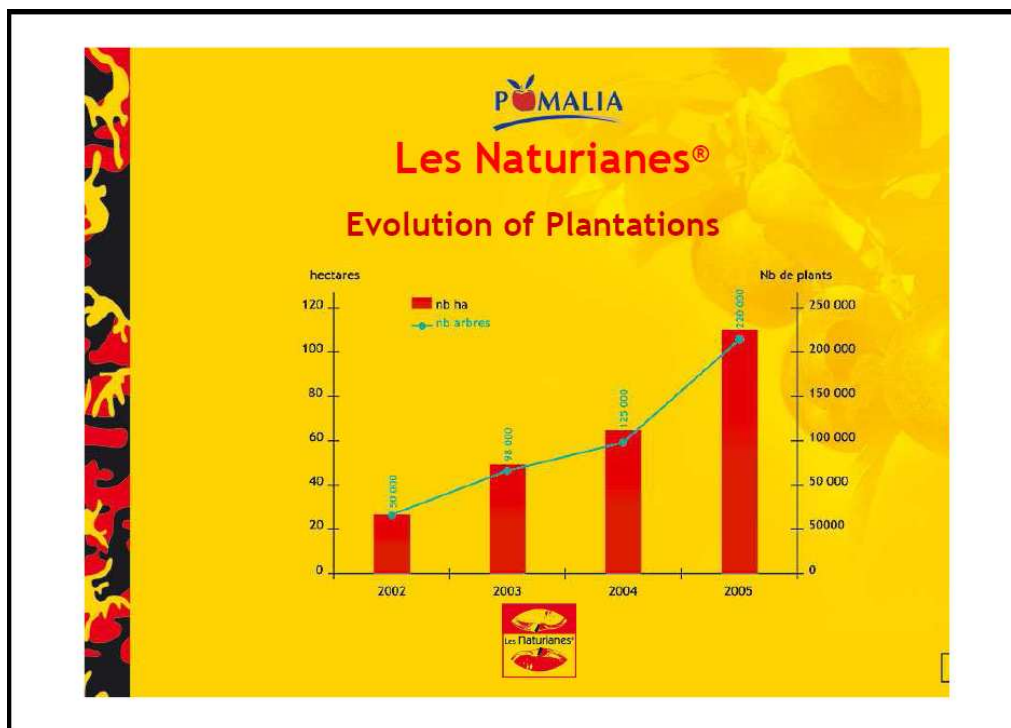
Ces travaux sont valorisés au travers de publications, les Editions de Rouergue sont assez militantes à ce niveau. En 2008 ces deux auteurs (Jean-Marie Lespinasse et Evelyne Leterme) ont publié cet ouvrage tout à fait remarquable, *Les Fruits Retrouvés Patrimoine de demain*, qui décrit 660 variétés appartenant à 14 espèces fruitières, avec cette visée de création de nouvelles variétés fruitières. L'INRA conduit des travaux plus fondamentaux pour caractériser les sources de résistance entre autres et nous contribuons aussi grâce à l'approche de pathologistes à réfléchir aux dispositifs des vergers de demain qui vont peut-être nous permettre de limiter la progression des épidémies qui est effectivement un problème très important aujourd'hui.



Vous avez ici par exemple deux systèmes différents, deux variétés alternées sur le rang () et ici deux variétés alternées entre rangs (). Les études épidémiologiques montrent que le dispositif 'variétés alternées sur le rang' limite mieux la progression de l'épidémie par rapport au dispositif 'variétés alternées entre rangs', sans parler évidemment des témoins, c'est-à-dire de la culture aujourd'hui, les blocs monovariétaux où nous avons aujourd'hui des problèmes sérieux de diversification, de souches parasites résistantes aux molécules pesticides. Ces travaux vont donc permettre, nous l'espérons, de reconsidérer le dispositif des vergers, à condition, bien sûr, que d'un point de vue économique ces nouvelles variétés cultivées dans de nouveaux dispositifs soient acceptables au niveau économique.

Pour conclure, comment faisons-nous la promotion de ces nouvelles gammes variétales ? Là je parle essentiellement du matériel que nous créons à l'INRA car il faut effectivement que ça ne reste pas confidentiel, il faut que le consommateur puisse profiter de ce matériel résistant et donc moins traité. Nous avons, je relate simplement la création de cette société qui s'appelle POMALIA qui regroupe des pépiniéristes, des organisations de producteurs et des metteurs en marché avec comme objectif de mettre sur le marché des variétés résistantes aux bio-agresseurs en coordonnant les plantations et surtout en mettant en œuvre une stratégie de marketing, ce qui est aujourd'hui essentiel. Vous avez là la façon dont nous travaillons au niveau de la sélection de ces nouvelles variétés qui implique non seulement l'INRA mais aussi le CTIFL pour, à travers une marque protégée, mettre ces nouvelles variétés sur le marché et en faire bénéficier le consommateur en France qui a aujourd'hui possibilité de trouver déjà ces nouvelles variétés moins sensibles aux parasites et donc moins traitées. Pour parler de l'évolution des plantations tout à

fait symptomatique on peut citer par exemple la variété Ariane qui montre une montée en puissance tout à fait conséquente.



Je remercie Jean-Marie Lespinasse, Mathieu Lascostes et Isabelle Calvière pour leur prêt de diapositives qui illustrent le travail qu'ils font dans leur Conservatoire et leur contribution à cette présentation. (...)

Q&A

B CHEVASSUS-au-LOUIS: Merci Yves d'avoir commencé à illustrer quelques points de notre session. Je retiens en particulier cette idée qu'à travers les productions fruitières on peut aussi relancer d'autres aspects de la biodiversité et l'exemple de la biodiversité des sols à travers le bois raméal et puis des pratiques culturelles adaptées étaient un bel exemple. Aussi cette idée que la diversité culturelle à travers l'association des citoyens et des amateurs non seulement à la conservation mais même à la création de variétés pouvait jouer un rôle tout à fait important. Ce matin on a évoqué la question des jardins et du rôle des jardins d'amateurs dans la consommation de fruits et légumes et le fait effectivement de proposer pour ces activités des variétés adaptées me semble une préoccupation tout à fait intéressante parce que très souvent les variétés proposées aux amateurs sont des variétés industrielles. Par exemple, le fait que les productions se fassent toutes au même moment sont plutôt des inconvénients pour des jardiniers amateurs donc le fait de prendre en compte ces considérations me semble tout à fait important.

Je pense que sur ces aspects utilisation génétique, exploration, utilisation, vous avez peut-être des réactions, des questions, des compléments que vous souhaitez apporter. (...)

PUBLIC (Cécile MAMAN de chez Danone) : Votre présentation m'a beaucoup intéressée. J'ai surtout compris que la préoccupation principale de la conservation des variétés c'était de trouver des résistances (...) et vous avez donné un certain nombre de critères. Le numéro 1 était la sensibilité aux maladies puis l'aspect original attrayant, les qualités organoleptiques et d'autres critères. Ma question est de savoir, dans tous ces critères, où la qualité nutritionnelle des variétés entre-elle en jeu ? Est-ce qu'il y a beaucoup de différence d'une variété à l'autre entre je ne sais pas, le contenu en vitamines, le contenu en antioxydants ? Je veux lier ça aussi au deuxième point que vous avez évoqué dans votre présentation, par rapport aux questions posées et aux systèmes culturels à savoir si sont étudiées les influences des systèmes culturels sur les qualités nutritionnelles des variétés des fruits.

Y LESPINASSE : Vous posez de bonnes questions, mais je n'ai pas de réponse à vous apporter. Nous savons effectivement que la pomme et la poire sont des fruits d'intérêt au niveau de l'apport nutritif. À ma connaissance, il n'y a pas de travaux qui permettent de dire, cette variété est effectivement plus intéressante sur le plan nutritif que telle autre. On commence à voir des publications où le nom de la variété est indiqué. Personnellement, je pense que l'ensemble de la pomme, il faut indiquer qu'il y a deux sous ensembles très importants, le sous ensemble pommes destinées au marché en frais et pomme destinées à l'industrie, en particulier en France nous avons tout un travail auquel l'INRA participe de création de nouvelles variétés pour le cidre avec des teneurs en polyphénols beaucoup plus importantes avec un apport d'amertume en particulier, donc nous allons avoir un ensemble variétal différent qui va donc être beaucoup plus riche au moins en polyphénols et donc quelque part en antioxydants. Par contre, dire que la variété Golden, par exemple, est moins riche, moins intéressante au point de vue nutritif que la variété Anixa que j'ai présentée tout à l'heure et qui fait partie de cet ensemble variétal d'autrefois, nous n'avons pas de données et je ne suis pas sûr que cela soit une piste vraiment intéressante.

PUBLIC (Cécile MAMAN de chez Danone) : A aucun moment dans l'élaboration des variétés vous vous demandez par rapport à celle de départ et celle d'arrivée, à aucun moment vous analysez pour savoir les qualités nutritionnelles ?

B CHEVASSUS-au-LOUIS : Sur la question de l'agronomie de qualité est-ce qu'il y aurait autour de la table quelqu'un qui pourrait éventuellement compléter ?

PUBLIC (Robert HABIB) : Sur cette question de la différence variétale, ce qu'il faut dire c'est que quand on regarde la variabilité individuelle des fruits sur un arbre par rapport à leur composition par exemple, on s'aperçoit que cette variabilité

individuelle est du même ordre de grandeur que la variabilité de la gamme variétale d'une part. D'autre part elle est fortement influencée par des pratiques culturales simples telles que la taille, l'éclaircissage, éventuellement le régime hydrique, la pluviométrie, le climat, le sol, etc. Pour répondre à votre question ce qu'il faudrait faire c'est essayer d'établir à l'échelle nationale, minimum, une base de données qui référence de façon précise les variétés, les pratiques de l'année en cours, les données climatiques et qui effectue un échantillon suffisamment significatif au niveau de l'arbre pour évaluer la variabilité intra-arbre. Je rejoins à peu près ce que vous a dit Lespinasse, c'est carrément impossible. Les sources de variation sont trop nombreuses.

PUBLIC (Yves DESJARDINS): Je peux peut-être commenter sur ce point ou indiquer qu'il existe beaucoup de travaux à travers le monde présentement qui mettent en valeur les Conservatoires et tous les « *Germplasm* » sur les effets de la santé. J'ai un bon exemple, celui sur les *Vaccinium*, qui est à l'Université de l'Oregon présentement où ils sont à reprendre et évaluer les caractéristiques santé des myrtilles, des bleuets, des canneberges, des *Rubus*, des framboises et des fraises et on peut voir des différences de qualités nutritionnelles entre autres du point de vue des polyphénols d'une valeur de 1 pour 1000 en termes de teneur et de concentration. Maintenant plusieurs programmes, en tout cas aux Etats-Unis, je sais qu'il y en a d'autres à travers le monde mais notamment au Etats-Unis, des programmes d'amélioration du bleuet, de la canneberge et de la fraise visent à améliorer les caractéristiques santé pour pouvoir justement créer de nouvelles variétés avec ce marqueur, cet indicateur de qualité. Je sais qu'à Genève présentement, dans le cadre de l'amélioration de la pomme, c'est une caractéristique qui est tenue en ligne de compte et je pense qu'il y a beaucoup d'avantages à aller revisiter d'anciennes variétés pour pouvoir éventuellement aller chercher tous les gènes qui pourraient être intéressants au niveau de la qualité nutritionnelle.

The diversity of French F&V: ethnic market development and the emergence of ancient and new species.

Michel CHAUVET

Agropolis International, Montpellier, France

Parler de géographie culturelle des F&L est bien ambitieux, et j'aborderai cette problématique par quelques exemples, qui montrent que les préférences culturelles peuvent contribuer au maintien de produits locaux, et que la banalisation liée à la mondialisation des échanges n'est pas inéluctable.

Je prendrai d'abord l'exemple des radis et des oignons. Il y a trente ans, je conseillais les exportateurs français de fruits et légumes, et on se préoccupait alors beaucoup de la concurrence néerlandaise. Les Néerlandais sont connus pour leur dynamisme en matière de légumes. Ils ont donc importé de Floride un mode de production industrielle de radis. Il s'agit de petits radis ronds rouges, récoltés mécaniquement, équeutés et mis en sachets plastiques. Les Hollandais ont créé des machines plus petites adaptées à une production sous serre et mis au point un emballage attrayant (des papillotes). Cela leur a permis de conquérir le marché allemand, mais ils se sont cassé les dents sur le marché français. Pourquoi ? Tout simplement parce que les Français tiennent à leurs radis demi-longs roses à bout blanc, avec en plus des préférences régionales sur la forme et la couleur du radis. De plus, ces radis doivent être vendus en feuilles, ce qui les déshydrate rapidement. Ils doivent donc être très frais pour rester vendables, et sont restés des productions maraîchères à un niveau local ou régional, résistant ainsi à la mondialisation. A la même époque, j'ai assisté à la déferlante des oignons néerlandais. Ceux-ci étaient produits dans les nouveaux polders, où l'on avait créé *ex nihilo* des exploitations agricoles de taille optimale disposant des meilleurs équipements de l'époque. Ils ont ainsi conquis le marché mondial et quasiment éliminé la production française. Mais, car il y a un mais, il s'agissait du type d'oignon dominant sur le marché, l'oignon sec et fort. Restaient quelques produits locaux. L'un d'eux était l'échalote rose, qui venait de faire l'objet d'innovation culturelle (la culture sur plastique au sol) et biologique (l'usage de semences dévirosées). Le Val de Loire puis la Bretagne ont rapidement développé cette production. Par ailleurs, il subsistait quelques petites zones en France où on produisait de l'oignon doux. Ce produit est plutôt un légume qu'un condiment, et les Méditerranéens l'apprécient pour le manger cru en salade. Ces oignons doux sont maintenant relancés comme produits du terroir (oignon doux des Cévennes, cèbe de Lézignan...). Non seulement ils font l'objet de préférences locales, mais ils sont aussi plus périssables que les oignons forts, donc moins faciles à gérer dans le grand commerce. Enfin, je mentionnerai un produit qui me tient à cœur, l'échalote grise, qui pour moi est la seule vraie échalote (et d'une espèce botanique distincte), et que l'on trouve surtout dans l'Ouest de la France, un peu dans le Sud-est, et en Italie où elle s'appelle *scalogno di Romagna*. Cette échalote a un goût prononcé et obtient des

prix élevés, mais n'est pas toujours facile à trouver. Au travers de ces exemples d'importance économique inégale, on voit que la diversité culturelle et la relance des terroirs permet, dans certaines conditions, de maintenir des productions et des marchés locaux.

Si on observe un pays voisin, l'Italie, on ne peut qu'être émerveillé de la diversité de leurs légumes. Les choux-fleurs ont des couleurs différentes d'une région à l'autre, le Romanesco en étant un exemple. Les chicorées exhibent aussi une grande diversité. L'une d'elles, appelée *puntarelle* (1.), est une chicorée amère qui a un plateau basal



1. « Puntarelle »
Cichorium intybus



2. « Radicchio »
Cichorium intybus



3. « Cavolo nero »
Brassica oleracea



4. « Trombette »
Cucurbita pepo



5. Mauve ; Mallow
(à Kairouan)
Malva verticillata

très large d'où émergent un grand nombre de tiges creuses ; ce sont elles que l'on mange, et non les feuilles. Coupées en fines lanières et mises dans l'eau où elles s'entortillent, elles sont ensuite accommodées en salade avec une sauce aux anchois, ce qui constitue un mets excellent. Ce produit et cette recette sont à ma connaissance connus uniquement en Italie. On trouve aussi les chicorées rouges ou *radicchio* (2.), dont il existe plusieurs types. L'Italie a même domestiqué des plantes en plein 20^{ème} siècle. *Diplotaxis tenuifolia* par exemple, est un substitut de la vraie roquette *Eruca vesicaria*, et se trouve fréquemment dans les marchés et restaurants italiens. De même, *Salsola soda*, appelé *roscano* ou *barba del sultano*, ou soude en français, est un légume bizarre, dont les feuilles cylindriques ressemblent vaguement à des haricots verts fins, et se mangent juste ébouillantées.

Un chou endémique de l'Italie est le chou palmier ou *cavolo nero* (3.); on le trouve uniquement en France dans les "potagers de curieux". Si l'on connaît la courgette (de l'espèce *Cucurbita pepo*), qui a dû apparaître en Algérie à la fin du 19^{ème} siècle, les Italiens ont innové en utilisant comme courgette d'autres types de courges de l'espèce *Cucurbita moschata*, les *trombettes* (4.).

Si l'on va dans l'est de la Méditerranée, on trouve un légume bizarre qui s'appelle en arabe *meloukhia*, et en français corète ou mauve des juifs. Il s'agit de *Corchorus olitorius*, que l'on connaît comme plante à fibre sous le nom de jute. C'est un accompagnement typique au Liban, en Egypte, mais aussi en Tunisie et dans toute l'Afrique tropicale. La caractéristique de ce légume feuille, qui est souvent desséché et moulu, c'est d'être très mucilagineux. Ce goût mucilagineux se retrouve chez une autre espèce consommée aussi en Egypte, en Tunisie, qui est la mauve, *Malva verticillata* (5.). La mauve était un légume apprécié dans la Rome antique ; on la voit parfois en Italie, ainsi elle a pratiquement disparu d'Europe en tant que légume. J'attribue

cette disparition à la répugnance que les Européens ont acquise vis-à-vis de la texture mucilagineuse, alors que l'attrance pour cette texture s'est maintenue dans certaines

régions comme l'Afrique. Dans l'est de la Méditerranée, on trouve aussi toute une famille de recettes de légumes farcis qu'on appelle en turc *dolma*. On connaît surtout les feuilles de vignes farcies au riz, mais on peut faire aussi des feuilles de choux farcies ou utiliser des poivrons ou des aubergines. Pour en disposer toute l'année, les Turcs, par exemple, évident des aubergines et les font sécher ; on les trouve vendues en chapelet dans les épicerie fines de Paris. Quant au poivron, le type préféré dans les Balkans est le 'Hungarian wax', qui a une couleur jaune clair et surtout une forme en cône étroit. Sa taille moyenne permet au goût du poivron de bien diffuser dans la farce. On a là un exemple de l'adéquation entre une recette de cuisine basée sur une tradition culinaire et un type variétal au sein d'une espèce.

Si on passe à l'Afrique tropicale, on peut s'appuyer sur un inventaire récemment publié par PROTA (www.prota.org), auquel j'ai participé. J'ai été frappé du grand nombre d'espèces utilisées comme légumes (275), et de la proportion de celles qui sont cueillies à l'état sauvage (la moitié), ou bien récoltées dans les champs comme adventices, avec des statuts divers qui vont de l'adventice tolérée à l'adventice favorisée puis à l'espèce proto-domestiquée. Du point de vue culinaire, les légumes sont souvent consommés en sauce, qui sert d'accompagnement à un féculent, celui-ci pouvant être du riz, du manioc, du mil, du sorgho ou du maïs. Pour faire la sauce, on peut les conserver en les desséchant et les réduisant en poudre. Ensuite, on les réhydrate et on les cuisine avec d'autres ingrédients. Deux types de goûts sont recherchés : l'amer et le mucilagineux. L'amertume est apportée par exemple par l'aubergine africaine, *Solanum aethiopicum*, qui ressemble à une tomate et devient rouge vermillon à maturité. Cette aubergine peut difficilement s'utiliser comme notre aubergine (*Solanum melongena*), et son amertume est compensée par le goût des autres ingrédients de la sauce. Un autre exemple de légume amer est *Vernonia amygdalina*, qui est un légume feuilles dont on fait un plat réputé, le ndolé.

Pour ce qui est de la texture mucilagineuse, on retrouve la corète et le gombo. Or en Afrique noire, on ne mange pas les mêmes types de gombo que dans la Méditerranée. Dans la Méditerranée, on préfère les gombos de forme allongée et qu'on récolte très immatures parce qu'on les consomme comme légume, un peu comme des haricots verts. Par contre en Afrique, on cherche plutôt des formes trapues que l'on cuisine à un stade plus mûr et qui sont très mucilagineux. A titre d'anecdote, mon fils a été récemment avec ses amis dans un restaurant africain et a remarqué un plat de gombo sur le menu. Comme il est aussi intrépide que moi en matière culinaire, il en a demandé. Le serveur l'a mis en garde, en lui précisant que c'était plutôt un plat pour les Africains, mais pas pour les Européens. Il a bien sûr insisté. Son plat s'est révélé tellement mucilagineux qu'il a provoqué chez mon fils une réaction de dégoût qu'il n'a pu surmonter. Au travers de ces exemples, on voit que les goûts et les dégoûts peuvent varier énormément d'une culture à l'autre, ce



qui a des influences sur toute la filière finalement et dont il faut tenir compte.

Au sein d'un même groupe d'espèces, on peut trouver une grande diversité, comme le montre la photo ci-joint, qui illustre la collection d'aubergines du château de Valmer, près de Vouvray, qui détient actuellement une des meilleures collections de légumes en France. En Indonésie, on consomme par exemple de petites aubergines crues, avec d'autres légumes crus. C'est surprenant, mais acceptable pour un palais européen. Dans d'autres pays, on les conserve en saumure, ce qui garde leur consistance croquante.

Passons maintenant en Chine. Comme le savent les habitués des restaurants chinois, un Européen est souvent dérouté à la fin du repas, car il n'y a pratiquement pas de dessert. Il y a des fruits, litchis, longanes ou "fraise chinoise" (*Myrica rubra*), mais aucun dessert vraiment sucré, ce qui constitue habituellement le point d'orgue d'un repas européen. Si l'on observe la gamme des fruits asiatiques, on ne peut que conclure que le goût sucré n'est pas nécessairement recherché. Dans les supermarchés chinois de Paris, on trouve par exemple des goyaves, mais ce sont des fruits énormes, verts et durs ! Autrement dit, ils sont consommés plutôt comme légume et appréciés pour leur caractère croquant, car ils sont trop immatures pour mûrir à la maison. Ce qui est surprenant pour nous, car les arômes de la goyave se développent quand elle est très mûre. De même, la papaye est appréciée verte, au point que la salade de papaye verte constitue l'un des meilleurs plats thaïlandais. Je citerai aussi le nashi, que les arboriculteurs français se sont efforcés d'introduire en Europe. Cette tentative s'est soldée par un échec, simplement parce que le nashi ne correspond pas au goût européen, qui attend d'un fruit qu'il ait du goût, or le nashi en a peu. Par contre, il est croquant et très juteux. Cela suffit à le faire apprécier des Asiatiques, dont les conceptions culinaires s'appuient sur des jeux d'oppositions de texture, de couleur et de goût (y compris l'insipide). Maintenant, on revoit le nashi, mais dans les supermarchés chinois, où il est acheté avant tout par des Asiatiques.

Dans le domaine des légumes, mes premiers essais culinaires ont été des fiascos, simplement parce que je cuisinais à l'européenne, où l'on cuit longuement les légumes. En fait, tout se passe comme si les légumes chinois étaient adaptés à leurs modes de cuisson et de consommation, autrement dit à peine saisis au wok, ou à peine cuits à la vapeur. Il est assez surprenant de constater que deux plantes botaniquement proches, le chou européen et le chou chinois, sont adaptés à des modes de cuisson opposés. Je ne peux enfin m'empêcher de citer des plantes qui ne sont pas des fruits et légumes, mais des céréales. On connaît le riz gluant, mais dans les zones montagneuses d'Asie du Sud, les populations locales ont une telle attirance pour la texture gluante qu'elles ont sélectionné des types gluants dans la plupart des céréales. Il y a ainsi des millets gluants, des sorghos gluants et même des maïs gluants. Ce dernier fait a longtemps constitué un mystère pour les botanistes. En effet, ce type de maïs, connu sous le nom de waxy par les techniciens, est inconnu en

Amérique Latine, où se trouve le centre d'origine du maïs. L'existence en Asie de ce maïs gluant a longtemps été un argument en faveur d'une possible présence du maïs en Asie bien longtemps avant Christophe Colomb. Cela montre en fait que la sélection populaire peut être très efficace, et qu'en quelques dizaines d'années, de nouveaux types variétaux peuvent apparaître quand les paysans ont un intérêt culturel marqué en faveur d'un caractère particulier.

Quelques mots sur le Japon pour finir. En observant la cuisine japonaise, plus encore que pour la cuisine chinoise, on est frappé par le fait qu'elle joue sur toute une gamme d'oppositions. Ce n'est pas seulement de l'art, c'est également de la technique très élaborée. Un aliment japonais ne prend son sens qu'en association avec d'autres. Il faut des oppositions de couleurs : le blanc du riz, le noir des algues, le rouge du shiso, le vert du wasabi ; il faut des associations de textures, avec des aliments mous, d'autres croquants ; il faut des associations de goût, le tofu insipide, le gingembre cru et piquant... Jamais le mot de Lévi-Strauss n'aura été plus vrai : "Un aliment doit être non seulement bon à manger, mais aussi bon à penser".

Pour le futur, que peut-on tirer de ces quelques éléments ? C'est que la mondialisation peut certes promouvoir des recettes uniformes. On a parlé de la *mcdonaldisation*, quoique le hamburger ait contribué à faire connaître en France les graines de sésame. Mais dans le même temps, les migrations humaines et la mondialisation des transports nous donnent accès à des cuisines du monde entier. Cela donne des occasions à des produits locaux de se maintenir et de se développer. La cuisine permet aussi le dialogue interculturel. Le monde serait bien triste si on devait manger partout les mêmes plats. La promotion de cette diversité culinaire est l'une des priorités du mouvement Slow Food, dont le slogan est maintenant que les aliments doivent être bons, propres et justes. J'ajouterai qu'ils doivent être divers. De ce point de vue, les réglementations peuvent avoir des effets pervers. Les appellations d'origine contrôlée, qui constituent un outil majeur de promotion des produits locaux, passent par exemple par la définition d'un cahier des charges. Or ce cahier des charges va s'imposer à tous ceux qui veulent l'appellation, et exclure ceux qui sont en dehors de l'aire d'application de l'appellation. Cela entraîne l'élimination des produits variés, dont certains pouvaient avoir un intérêt.

Pour promouvoir ces produits locaux, il faut bien entendu les documenter, les décrire, recueillir les recettes. Ce travail d'inventaire, que mènent les anthropologues de l'alimentation, reste parcellaire. Il faut aussi analyser les processus d'élaboration des produits, pour identifier les facteurs de blocage et aider ces produits locaux à s'adapter, à passer d'un stade quasiment familial à un stade artisanal ou de petite industrie. Ce n'est que de cette façon que les produits locaux peuvent devenir disponibles sur les marchés des villes. Cela peut passer par l'amélioration génétique des plantes locales, l'amélioration des techniques de production, une certaine forme d'industrialisation des processus et enfin des mesures de protection, comme les AOP,

IGP ou autres. Mais il n'est pas sûr que ces actions soient suffisantes, parce qu'on doit faire face à des forces d'imposition culturelle ; quand on est citadin et qu'on a un peu de moyen, on veut manger comme les riches des pays développés, et on délaisse les aliments des pauvres et des ruraux. C'est ce qui explique par exemple la désaffection des légumes secs en Europe.

Pour finir, la critique majeure que je fais à la notion de diète méditerranéenne est justement qu'elle se fonde sur le régime alimentaire des Crétois ruraux. Or non seulement ces populations vivaient à la campagne, mais elles étaient également pauvres. Notre problème est bien différent. Comment faire pour que des urbains un peu plus riches conservent le régime alimentaire des ruraux pauvres ? Je n'ai pas la réponse, Mais je constate avec les anthropologues que riches et pauvres partagent largement les mêmes schémas culturels. Les pauvres n'ont simplement pas les moyens de manger de la viande, mais dès qu'ils en ont les moyens, ils le font. Rappelons-nous qu'il n'y a pas si longtemps, les paysans français allaient vendre leurs poules à la ville. La "poule au pot" ne se mangeait que dans les grandes occasions.

Il nous faut donc accomplir une véritable mutation culturelle. Pendant des millénaires, notre alimentation nous était largement imposée par des contraintes écologiques et économiques. Nous avons maintenant l'embarras du choix. Ce choix se portera sur des produits frais ou traditionnels seulement si ceux-ci acquièrent un statut social et culturel élevé. Si on éprouve du plaisir à faire la cuisine et à manger des aliments goûteux et diversifiés, s'il devient chic d'en parler, on aura fait la moitié du chemin. Restera aux filières économiques d'accompagner ces tendances et de s'y adapter.

Q&A

Public (Président de l'interprofession INTERFEL): Ma question est un peu politique, j'ai assez épousé votre analyse des différents modèles simplement j'aimerais de votre part une réponse un peu plus précise qu'il y a au-delà des vœux pieux une extraordinaire contradiction entre les données économiques et financières notamment par rapport à la distribution, au cahier des charges de la grande distribution, je vais prendre un seul exemple, c'est l'exemple des clubs pomme qui ont une dimension mondiale sur un certain nombre de variétés et les logiques un peu comme les vôtres qui émanent un peu des intentions culturelles. Le patrimoine français de la pomme en 2000 était de 3000 variétés, je pense que l'INRA, excusez-moi, n'a pas fortement contribué à maintenir un certain nombre de variétés qui étaient en totale adéquation avec des attentes de consommateur notamment sur le goût. Comment dépassez-vous, par rapport à ce que vous avez dit tout à l'heure, cette contradiction entre des vœux pieux qui s'expriment, je pense, par rapport à des

logiques culturelles, socioculturelles, et puis les raisons économiques et financières qui vont complètement a contrario par rapport à ça ?

M CHAUVET : Vous remarquerez que j'ai mis quelques bémols à mes propos. Yves Lespinasse nous a parlé des actions en faveur de la diversité génétique fruitière. C'est un des domaines où l'INRA a eu une politique constante d'inventaire et de maintien des ressources génétiques, mais aussi d'amélioration des plantes avec un objectif de qualité gustative. En témoignent la fraise Gariguet, les pommes Chanteclerc et Ariane, la poire Angélys.

Public (Président de l'interprofession INTERFEL) : Pour être plus précis Monsieur (...), la dernière variété de tomate de tomate qui a été trouvée en 1966 est la Montfavet, expliquez moi sur quel matériel végétal nous travaillons aujourd'hui dans le cadre de l'expérimentation appliqué sur la tomate en France sinon qu'à partir de deux laboratoires fondamentaux qui sont ou israéliens ou hollandais. Comment, à partir de matériel végétal qui quelque par me semble-t-il ne traduisent pas les sensibilités que le consommateur français dans tout ce que vous avez exprimé au niveau des logiques de goût, culturel etc. corresponde ? Vous avez donné l'exemple hollandais sur l'oignon, je voudrais la même chose sur la tomate, on n'est pas du tout sur du matériel végétal en conformité avec nos attentes. Je n'ai pas connaissance que l'INRA ait eu sur ces questions là une politique volontariste par rapport à la recherche.

M CHAUVET : Je suis un peu mal placé pour répondre à cette question complexe, et je préférerais que Bernard Chevassus le fasse.

B CHEVASSUS-au-LOUIS : Je ne voudrais pas qu'on développe ici un débat trop franco-français. Je pense, et qu'on ne joue pas à renvoyer des balles, qu'il y a eu une période quand même dans laquelle on considérait que le fait que la recherche publique créait des variétés était, disons, de la distorsion de concurrence par rapport à la concurrence privée donc certains ont dit à la recherche publique, on pourrait aussi le dire au Canada et dans d'autres pays pas uniquement en France qu'il était pour le moins urgent que la recherche publique se désengage de la création variétale. On peut reposer la question aujourd'hui dans la mesure où on comprend mieux je pense ce que fera ou ne fera pas la création variétale privée et on sait en particuliers que 80% du chiffre d'affaire des semenciers privés va se concentrer sur les 4 majeurs que sont le maïs, le soja, le coton et un peu secondairement le colza. Par rapport à ça si on estime qu'effectivement un effort public doit être fait non seulement dans la conservation des ressources mais dans la création de variétés adaptées, il faut effectivement repenser globalement notre système de recherche et développement. Je ne détaille pas davantage mais je voulais rappeler cet élément d'histoire. Je ne prends qu'un exemple très concret pour ceux qui la connaissent, il y a une fraise qui s'appelle Gariguet que l'INRA avait obtenu, cette fraise n'a connue de succès

commercial que pratiquement 1 ans avant la fin de l'obtention de la licence INRA donc elle était restée pendant près de 20 ans dans les placards et non-utilisées par les producteurs mais encore une fois ce ne sont que quelques éléments histoire de garder des relations amicales.

Public (Jean SALLE, producteur de légumes à Perpignan, Président de VINIFLORE, Conseil Plénier) : Juste une observation sur le cap qu'il y a en ce moment INRA a obtenu cet énorme succès sur la fraise par anticipation non-exploitée mais dans le moment où cela a été effectivement exploité. Peut-être que l'INRA était extraordinairement en avance, probablement d'ailleurs, peut-être que les professionnels étaient extraordinairement en retard, très probablement aussi d'ailleurs. C'est dommage que la recherche n'ait pas fini de faire comprendre effectivement les avancées qu'elles avaient faites, qu'elles n'aient pas été capables peut-être aussi de faire comprendre qu'il y avait quelque chose à faire là. En tout cas, autant il serait négatif de dire que l'INRA a été trop en avance, ça serait négatif de dire que les professionnels étaient trop en retard, le sujet ici je crois, c'est de dire comment faisons nous pour qu'un tel gaspillage ne se reproduise pas. (...) Je crois que je rejoins en ça quand le président de l'interprofession fait part de ces interrogations.

M CHAUVET : si on prend l'exemple de la fraise, je ne suis pas sûr qu'il y ait eu vraiment un gaspillage. Quand l'INRA a arrêté son travail sur la fraise, le matériel génétique a été remis à un centre interprofessionnel, le CIREF, qui a continué l'effort d'amélioration des plantes. Cela a donné entre autres les variétés Ciflorette et Cigaline. Mais le problème, c'est qu'il faut raisonner au niveau de toute la filière. Il suffit qu'un des maillons de la filière soit défaillant pour que l'innovation ne se fasse pas. Il y a trente ans, l'expédition et la distribution considéraient que la diversité des fruits et légumes, multipliée par la diversité de leurs spécifications commerciales, était trop difficile à gérer, sans parler de la périssabilité des produits. On a donc cherché à diminuer le nombre de références. Par ailleurs, le consommateur garde l'impression qu'en achetant un fruit ou un légume, il achète un produit, et il ne comprend pas que ce produit ait un prix aussi bas bord champ et un prix aussi élevé en rayon. Or tout économiste vous dira qu'il n'achète pas un produit mais un service. Il y a un monde entre le rural qui récolte dans son jardin ou achète à des producteurs voisins, et le citadin qui vit dans une mégapole et achète des produits qui viennent de régions d'expédition lointaines. Cela pose des problèmes de logistique considérables.

Mais on constate des évolutions intéressantes, avec l'apparition de circuits courts et un intérêt grandissant des consommateurs pour la diversité. Après une phase "tout Golden", on a maintenant une gamme assez diversifiée de pommes. La situation s'est donc améliorée. Pendant des décennies, la concurrence portait sur les prix. Maintenant, elle porte aussi sur la diversification, et c'est excellent. Je dirai, en tant

que citoyen, que l'important est que l'on veille à maintenir des options, que l'on ait le choix entre des produits chers et bon marché, et entre divers modes de distribution. Souvent, la grande distribution ne sait pas gérer un rayon fruits et légumes, car ce sont des produits périssables. Pourquoi ne pas prévoir alors qu'un détaillant spécialiste s'installe dans les centres commerciaux ? Dans certaines régions, les hypermarchés ont décidé de ne pas avoir de rayon poissonnerie ou boucherie ; mais on trouve des spécialistes dans le centre commercial, et le consommateur sait donc qu'il trouvera tous les produits qu'il cherche. De plus, il apprécie d'avoir un rapport humain avec un détaillant et de pouvoir lui faire des remarques sur ses produits, chose bien plus difficile dans un hypermarché anonyme. Il y a toute une réflexion de fond à mener sur la distribution. Si l'on veut que le consommateur mange davantage de F&L frais, il faut bien sûr qu'ils aient un prix abordable, mais surtout qu'ils aient du goût, que l'on sache dans quelles conditions ils sont produits, d'où ils viennent, etc. Le consommateur devient exigeant et compétent, et la filière doit faire de même.

Public (Mariano WINOGRAD d'Argentine) : Ceci n'est pas une question mais une suggestion. Le débat est très intéressant mais pour nous qui ne sommes pas d'ici nous ne connaissons pas vos noms et professions.

Public (Jean SALLE) : Je suis Jean SALLE producteur de légumes à Perpignan, Président de VINIFLORE, Conseil Plénier). Simplement je voudrais dire, puisque j'ai la parole, Monsieur Chauvet, Monsieur le Président, Monsieur Chevassus-au-Louis, je n'étais pas du tout critique tout à l'heure lorsque je parlais de gaspillage, il n'y avait aucune notion de valeur, c'était un simple constat qui me semble-t-il pouvait apporter quelque chose qui est de dire, comment se fait-il que nous ayons pu, malgré nous, malgré nos savoirs et nos bonnes volontés, malgré le nombre de spécialiste qu'il y a, comment se fait-il que nous n'ayons pas abouti et que finalement on ait perdu du temps entre moment où cette fraise qui était extraordinaire, la Gariguette et le moment où on l'exploite on est pu perdre 15 ans ou quelque chose comme ça. C'est une erreur de nous tous ou en tout cas un constat de notre propre incapacité probablement de la filière ou des filières à la fois de la recherche, à la fois des chercheurs qui trouvent et de ce qui est exploité. Avant d'apporter les réponses il me semble qu'il est essentiel que l'on s'entende sur les questions que nous devons nous poser parce que nous sommes ici finalement pour dire, comment se fait-il que les fruits et légumes qui sont une part des produits alimentaires si essentielle semble-t-il à la santé, il me semble que tous le monde soit à peu près d'accord, cette réponse alimentaire si positive, comment se fait-il qu'il y ait à la fois ça et une obésité qui ne fait que galoper et comment se fait-il effectivement que malgré cette qualité là, tant de producteurs de fruits et légumes autour de grandes villes disparaissent qui font que probablement cette ressource taris plus vite que d'autres productions en tout cas en France et que l'on soit désormais obligé de les importer de beaucoup plus loin alors que nous savon ce que devient le climat en tout cas les interrogations que nous avons dessus, ce que devient l'eau, ce que devient le coût du pétrole, pourquoi ne

sommes nous pas meilleurs sur ce plan là. Voilà pourquoi je dis qu'il est important de voir nos difficultés, nos propres défauts.
(...)

Cultural and biological diversities: the need for a joined approach.

Daniel Veschambre

CTIFL, Paris, France

Dans mon exposé il y aura un certain nombre de points qui vont se chevaucher avec ce qu'a dit Michel Chauvet mais sans doute de façon différente. La particularité concernera ce qu'on pourrait appeler un indicateur de la biodiversité au niveau du négoce des fruits et légumes.

- Les origines sur la diversité alimentaire :

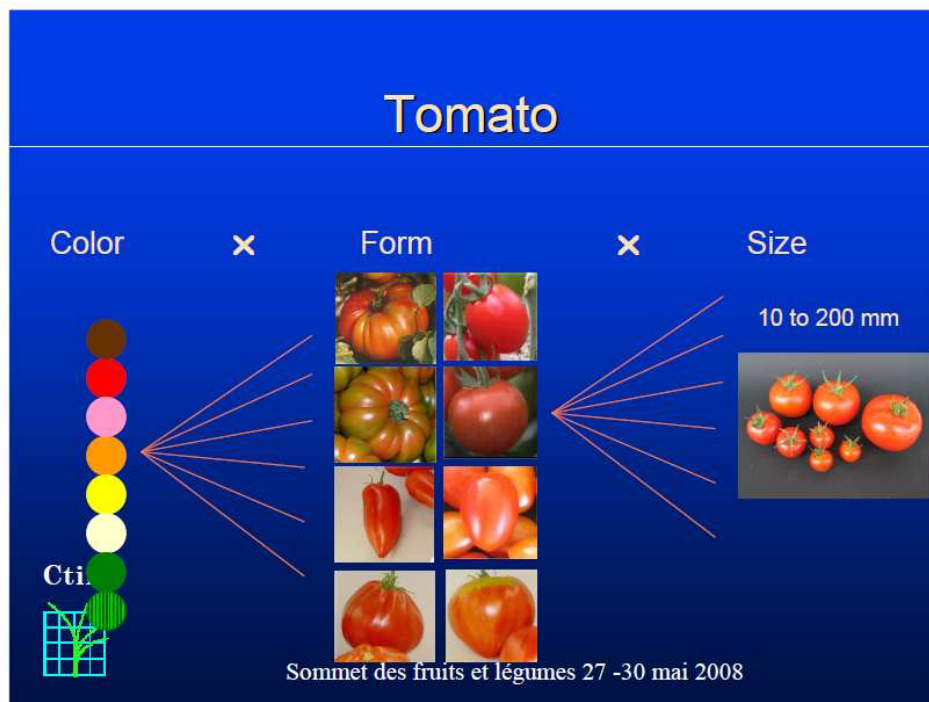
La diversification offerte à la consommation ou que les consommateurs peuvent utiliser est liée à un certain nombre de découvertes déjà citées : la découverte de l'Amérique mais aussi sur la période dite « des Lumières » qui a été une période où l'innovation et la curiosité ont été les maîtres mots à penser : elles ont permis de trouver des nouveaux produits intéressants qui jusque là étaient considérés de façon un peu suspecte, comme la tomate.

Dans la liste un peu longue (...) de ce qu'étaient les productions légumières avant la découverte de l'Amérique l'alimentation était basée principalement sur du chou rave, sur des lentilles, sur du navet ou le navet chou et aussi des oignons. Les autres légumes étaient consommés de façon beaucoup plus réduite. Il est intéressant de voir l'origine de la biodiversité d'un très grand nombre de régions sur le globe et, peu en Europe finalement. Là où il y a des points d'interrogations ce n'est pas sur l'origine qu'on se pose des questions mais c'est sur le fait que ces légumes étaient cultivés depuis longtemps et dont on a perdu les types botaniques d'origine : l'exemple classique étant celui de l'artichaut ; on voit bien que c'est un chardon mais on ne trouve plus le type botanique dans la nature.

L'exemple de la carotte est à la charnière. Le développement de la carotte a son origine en Afghanistan où se situe la biodiversité. Elle s'est développée en Europe au 14^{ème}, 15^{ème} siècle donc juste avant la découverte de l'Amérique et puis ensuite a essaimé dans l'ensemble du monde avec des évolutions variables entre l'Asie et l'Amérique avec un retour sur les types américains vers les zones de sélection aussi bien au Japon qu'en France. Il y a une espèce de bouclage des ressources génétiques et de la biodiversité pour redévelopper différents types. Ces types très différents en couleurs, en formes, en longueurs que l'on peut obtenir ont été présentés au 32^{ème} « Colloque Carotte » en 2007 à Arcachon. La diversification liée à la couleur, est peut-être un effet de mode pour le consommateur : une carotte noire finalement va seulement colorer l'eau de cuisson en noir mais cela n'a pas d'autre intérêt, la couleur n'est intéressante que si elle est le témoin d'autres qualités soit gustative, soit nutritionnelle. On pense bien sûr à des enrichissements en caroténoïdes ou en polyphénols qui pourraient être intéressants. La couleur en elle-même n'a pas

beaucoup d'intérêt à part peut être faire de la décoration ce qui est, avouons le, un peu limité.

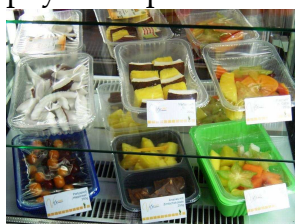
Les nouveaux légumes qui sont arrivés à partir du début du 16^{ème} siècle ont profondément bouleversé l'alimentation, non seulement en Europe, mais plus largement sur la planète. La pomme de terre et les haricots ont largement remplacé les lentilles ; la tomate qui a attendu certes la fin du 18^{ème} siècle et la mode du rouge assurée par la Révolution française pour se développer dans le courant du 19^{ème} siècle, c'est aussi le cas de la fraise à gros fruit qui s'est développée seulement au 18^{ème} siècle par une facétie du hasard où des espèces américaines ont réussi à se croiser à *Plougastell Daoulas* : quelques dizaines de pieds ont permis de sélectionner la fraise pendant 250 ans. Les programmes de sélection repartent des types botaniques américains, considérant que l'on a épuisé les possibilités de variabilité génétique. Le piment par contre, originaire d'Amérique Centrale s'est développé très rapidement au 16^{ème} siècle quasiment sur toute la planète à une rapidité assez surprenante pour l'époque.



Pour la tomate la multiplication de la diversité se fait à partir des différentes couleurs qui existent dans les types botaniques et les différentes formes de fruits et la taille. Le nombre de type est considérable, par rapport à la consommation. En réalité, on arrive aujourd'hui à avoir 70 ou 80 références tomate possibles ce qui est, très récent, une dizaine d'années : certains magasins peuvent proposer à la fois 15 références tomate différentes. Au-delà de la couleur, il y a aussi la diversité d'usage : tomate cerise en « snacking » et grosse tomate, à farcir pour donner un exemple. La couleur là aussi pourrait être couplée à des qualités nutritionnelles ou gustatives différentes. On peut avoir aussi des tomates enrichies en lycopène mais elles n'ont pas de goût différent en soi ; il faut donc pour le consommateur un marqueur de ces qualités nutritionnelles.

On a aussi dit l'importance de la diversification liée à l'importance des migrations, soit le tourisme de masse, soit les migrations de populations qui restent attachées à leurs traditions d'origine. Tout cela est source d'enrichissement considérable dans ce que l'on va pouvoir trouver dans les magasins.

On peut noter aussi dans les facteurs de diversification, l'innovation liée à la restauration. Le cas typique a été celui du kiwi en Europe où le besoin chez le consommateur a été créé à travers les pâtisseries qui ont proposé des pâtisseries avec du kiwi à la fin des années 70. Son développement s'est fait comme un fruit de luxe dans les magasins avant de connaître le succès que l'on sait. On voit maintenant des fleurs consommables, avec des algues. Faut-il les rattacher aux fruits et légumes ? Les populations migrantes ont introduit l'igname, déjà citée, la pousse de soja liée à la cuisine chinoise qui se fait sur notre territoire et est devenu un phénomène de masse, ou les besoins en noix de coco ou la menthe pour ceux qui l'utilisent. On a beaucoup parlé des produits en l'état ; il y a maintenant la préparation des produits qui est quelque chose d'assez nouveau : son développement est considérable dans tout les pays européens et les pays développés mais pas seulement.



Dans les fruits préparés, un exemple d'association de la noix de coco et de l'ananas, on peut aussi associer de la carambole et de la pastèque. Parfois on va plus loin : à la noix de coco on peut avoir le flacon de sauce au chocolat qui peut permettre de le consommer de façon tout à fait nouvelle. L'accroissement du secteur de produits préparés, a été pendant plusieurs années à deux chiffres, il est maintenant de 4% en Europe occidentale. Un taux de 4% d'accroissement de marché est remarquable surtout quand il s'inscrit dans la durée.

- Le référencement en magasin, indicateur de la diversité alimentaire :

Le référencement ou plutôt le nombre de références que proposent les magasins en matière de fruits et légumes peut constituer un bon indicateur. Quand on parle de référence fruits et légumes, ce ne sont pas des fruits et légumes différents ; une référence est une présentation d'un produit ; donc pour de la golden vide, la golden en sachet de 2 kilos et de la golden en barquette, on compte 3 références. Il n'en est pas moins que les chiffres sont éloquentes. Il y a 40 ou 50 ans l'approvisionnement en fruits et légumes se faisait dans l'alimentation générale, il y avait quelques spécialistes mais l'essentiel de l'achat en fruits et légumes se faisait dans l'alimentation générale ou, en épicerie, qui offrait environ une trentaine de références fruits et légumes. Dans les années 80/90 on a vu apparaître des spécialistes qui ont remplacé des alimentations générales, maintenant disparues complètement du panorama, en particulier en France. Ces spécialistes ont accru leur gamme liée avec l'arrivée de nouveaux produits. Sont apparus aussi les hypermarchés qui rapidement sont passés à une centaine de références fruits et légumes. A la fin des années 90 sont apparus les magasins hard discount qui sont plutôt revenus à un appauvrissement

de la gamme, c'est-à-dire qu'on est revenu à une trentaine de références. Ces magasins privilégient l'écoulement rapide d'un seul produit à bas prix : a une tomate, une pomme ou deux maximums sur des produits de grande consommation. En 2008, les choses ont considérablement évoluées : les spécialistes surtout quand ils sont très qualitatifs et dans les quartiers certes qui le permettent peuvent arriver à avoir jusqu'à 200 références fruits et légumes ; les hypermarchés arrivent à 150 ou 200 références fruits et légumes et les hard discounters ont un peu progressé avec 2 ou 3 références pomme et tomate. Si on regarde dans d'autres pays comment ça se passe on peut distinguer :

- les pays d'Europe du sud où il y a une « culture » des fruits et légumes et qui se traduit par une consommation saisonnalisée. On a une notion dans les pays d'Europe du sud de ce que sont les produits de saison : même si tous les produits sont présents toute l'année, il y a quand même une saisonnalité de la consommation. Les produits préparés, les produits de 'convenience' sont relativement limités même s'ils ont progressés : 10 à 15 références et qui sont axés notamment en France sur la gamme salade.

- Les pays plus au nord sont assez différents. Il y a, particulièrement en Allemagne, une préférence pour les produits allemands car il y a eu depuis 10 à 15 ans un développement de la production des légumes en Allemagne pour des raisons socio-économiques, un accroissement considérable de la production d'asperges, de fraises, de carottes et ces produits là sont très présents. Les importations en Allemagne se font traditionnellement de pays qui sont des clients depuis longtemps de l'Allemagne ; ce sont des relations également culturelles qu'il y a entre l'Allemagne, l'Italie, la Grèce et la Turquie. On trouve aussi de nombreux produits exotiques qui sont liés au fait que les allemands sont également de grands touristes ; ceci a créé des besoins liés à la découverte de produits nouveaux ; la présence de la communauté turque influence aussi les marchés allemands. Les références dans les magasins allemands sont de l'ordre de 120 à 150. En Angleterre les choses sont un peu différentes très marquées par une politique de qualité de la grande distribution pendant un certain nombre d'années ; l'existence de la publicité comparative est assez originale en Angleterre ; préférence également pour les produits anglais, on va seulement faire appel à l'extérieur lorsqu'on n'a pas ce qu'il faut sur place et finalement relativement peu de produits exotiques sauf lorsqu'il y a des communautés importantes notamment sur la région londonienne. Un nombre important de produits préparés lié sans doute à la restauration rapide et du peu de temps de préparation des légumes dans ce pays.

Aux Etats-Unis, les choses sont assez différentes dans le sens qu'il y a un merchandising qui a été adapté aux communautés asiatiques, hispaniques etc. et des références très nombreuses dans les grands magasins : on arrive jusqu'à 250 références dans les magasins en fruits et légumes mais avec une structure très différente de ce que nous avons en Europe : les produits préparés (de 'convenience') sont majoritaire avec 150 références alors que les produits en l'état sont minoritaires, toute proportion gardée. Aussi, l'utilisation d'un soin au produit en rayon qui est

une pratique courante et qui commence juste à se développer en Europe avec de la nébulisation et de la brumisation, alors que l'assistance à la vente a plutôt tendance à disparaître en Europe. Donc, des politiques assez différentes au niveau des distributeurs par rapport à l'attente des consommateurs.

Quelques exemples produits de 'convénience' qu'on connaît encore peu en France mais qui sont développés notamment au Etats-Unis et dans certains pays d'Europe du nord et qui sont promis à un grand développement.



Dans les pays émergents de l'est de l'Europe, de la Turquie, du Maroc, l'implantation des supermarchés se développe, les spécialistes s'adaptent petit à petit. Il y a des importations dans ces pays de produits étrangers mais qui côtoient bien entendu le marché local qui continue à exister heureusement mais on arrive à des contrastes qui sont saisissants entre les marchés locaux et les hypers.

Deux photos illustreront :



Un marché local du sud de Madagascar, pays de grande biodiversité et de l'autre coté des supermarchés à Tanger en 2008.

Q&A

B CHEVASSUS-au-LOUIS : (...) Cette intervention montre effectivement le message qui me semble important qui est que l'évolution des technologies et notamment l'évolution vers de produits préparés peut être un vecteur de diffusion de la diversité, aussi bien de la diversité des variétés que même la diversité des espèces à travers la présentation de composition qui sont attractives et peuvent donner envie. Peut-être une question sur le rôle de la technologie : est-ce qu'il y a d'autres technologies émergentes qui vous sembleraient importantes de mentionner comme pouvant faciliter la diffusion d'une plus grande diversité de fruits et légumes?

D VESCHAMBRE : Il y a la nécessité d'avoir un produit qui reste frais : comment un produit qui a une faible consommation va pouvoir être maintenu en rayon s'il perd son attractivité ? C'est toute la question si le produit doit être transporté. Certains produits se transportent mal, tout ce qui est feuille notamment va très mal se transporter. Les technologies liées à la préparation ne sont pas seulement une affaire de découpe, il y a aussi derrière un travail de maintien de la qualité dans la préparation grâce à l'ensachage. Pour la sécurité microbiologique, ce sont des produits qui sont lavés donc prêt à l'emploi. On utilise des auxiliaires technologiques à base de chlore mais il y a d'autres produits qui apparaissent. On utilise aussi des atmosphères modifiées à l'intérieur des barquettes pour éviter la dégradation des produits et on arrive à des dates limites de consommation sous froid dirigé assez bas de l'ordre de 4 à 6°C et on arrive à voir des durées de consommation qui sont de l'ordre de 15 jours parfois 20 jours sur des produits frais. Si les produits ne sont pas préparés ils se dégradent au contraire très rapidement malgré les soins que l'on pourrait apporter notamment par nébulisation ou la brumisation, qui permettent toutefois de conserver une certaine fraîcheur aux feuilles pendant quelques jours.

PUBLIC (Robert HABIB) : Une question sur l'évolution des produits transformés. Quand on sait que le problème de consommation de fruits et légumes est essentiellement lié à la faiblesse des revenus, il y a une corrélation positive entre le niveau de revenu et le niveau de consommation, ces produits transformés est-ce qu'on peut penser que c'est une solution pour ces populations qui ont déjà du mal ? Ou est-ce que ça vise le segment de marché des déjà-consommateurs des fruits et légumes ?

D VESCHAMBRE : Non, je pense que les produits préparés peuvent permettre à certaines catégories de retrouver le goût des fruits et légumes = s'ils ne sont pas préparés, ils n'achètent pas de fruits et légumes. Les études que nous faisons sur la façon de les consommer le montrent, les personnes travaillant jeunes, forcément ultra pressés ne consomment plus des fruits et légumes et ne consomment plus des fruits et légumes qui ont besoin d'une préparation, l'épluchage notamment. C'est l'abandon et la disparition de la consommation de produits comme l'asperge ou l'artichaut. Certaines catégories de population de moins de 30 ans, travaillant et quel que soit le niveau social, ne savent plus qu'il faut peler une asperge pour la manger. C'est dramatique.

B CHEVASSUS-au-LOUIS : On a discuté ce matin en séance plénière des facteurs qui sont responsables actuellement du prix des céréales et des aliments, comment vont-ils jouer sur les fruits et légumes ? Est-ce qu'ils vont jouer de manière plus importante et donc augmenter encore cette question du prix élevé ? Est-ce que vous avez déjà des études ? Ou est-ce qu'au contraire les fruits et légumes vont être un peu à l'abri de cette augmentation des grandes denrées comme les céréales ? Est-ce que vous avez déjà des analyses dans ce domaine ?

D VESCHAMBRE : L'impact de l'énergie va se retrouver sur certaines productions, celles qui sont transportées mais en fait, le coût énergétique du transport est relativement faible. Pour faire venir une tomate du sud Marocain, plus loin encore qu'Agadir, Dakhla sur le tropique, en camion, puisque c'est le seul mode qui est utilisé, il faut compter 0,1 litre de fuel par kilo. C'est gênant pour le gaz à effets de serre mais c'est relativement peu par rapport prix vendu au consommateur. Il y a le cas des productions qui sont chauffées sous serres en Europe Occidentale qui vont forcément poser problème avec le coût de l'énergie. Sur ces produits là, les difficultés apparaissent déjà.

PUBLIC (José FANASSE, Directeur exécutif de la Société Internationale de Sciences Arvicoles) : (...) Nous reconnaissons que dans le monde entier il y a un regain d'intérêt pour les fruits et légumes, il y a un accroissement de la consommation des fruits et légumes, il y a une augmentation de la consommation locale parce qu'on a parlé souvent du transport et de la vente internationale du marché mais il y a quand même une grande croissance dans la consommation locale aussi dans les pays en voie de développement. On a vu ce matin les photos en Norvège de la cave biodiversité que M. Yves Lespinasse nous a montré, nous connaissons très bien le Global Crop Diversity Trust qui est l'organisme (...) initiatives et, en étant la Société International Orticole on a eu des discussions avec eux en demandant qu'ils fassent aussi des efforts nécessaires pour les fruits et légumes, un de nos collègues a composé avec un King la stratégie pour le fraisier et quand la stratégie pour sauvegarder la diversité du fraisier était présenté au privé, au secteur privé et on a eu un « niet », on n'avait pas d'argent pour continuer la sauvegarde de la ressource génétique du fraisier. Cela montre que nous sommes défavorisés par rapport aux grandes cultures. Pour conclure, je crois qu'il est nécessaire qu'on continue à défendre notre profession, pour la qualité de nos produits, pour le secteur en général, et on a besoin quand même d'une revitalisation, comme l'a dit M Chauvet, de la culture des fruits et légumes. Dans beaucoup de pays en Afrique, je me rappelle, quand on parle de carottes ils disent 'ça c'est pour les lapins'.

PUBLIC (Guy ST MARTIN, Président du Conseil Régional Aquitaine) : Je suis en charge de la promotion des produits, de leur qualité, de la défense des produits du terroir et j'interviens après ce que viens de dire M Veschambre concernant la consommation des fruits et légumes. Il est vrai que la consommation de fruits et légumes peut être amoindrie par le fait qu'il y a un phénomène de préparation et que de plus en plus les jeunes ménages n'ont pas le temps d'éplucher et ainsi de suite, tout cela est sûrement vrai mais, il y a un autre problème sur lequel je voudrais attirer votre attention. C'est la distorsion qui existe entre le prix de la production des fruits et légumes et le prix à la consommation des fruits et légumes. (...) Récemment encore vous aviez dans les grandes surfaces de la salade à 1€ le pied et les

producteurs s'en défaisaient difficilement à 0,15 centimes. Je crois que cet écart majeur qu'il y a entre le prix à la production et le prix à la consommation entraîne tout à la fois une sous-consommation parce que le consommateur ne peut pas payer aujourd'hui avec les difficultés qu'il peut rencontrer et, en plus de ça, cela entraîne un phénomène de surproduction et le producteur ne peut plus vendre. Il y a aussi, je crois, un problème de régularisation des marchés qui me semble important à réfléchir pour voir comment on peut arriver à ménager ce système là qui fait que d'un côté des producteurs vendent difficilement et parfois à bon marché, très bon marché leurs fruits et leurs légumes et de l'autre côté des consommateurs qui ne peuvent pas acheter.

Public (R HABIB) : C'était une remarque mais elle correspondait aux questions précédentes, est-ce qu'on peut comparer la crise alimentaire actuelle sur les produits vivrier avec ce qui pourra advenir sur les fruits et légumes. Simplement, le fait que les fruits et légumes soient des produits extrêmement périssables, comme l'a rappelé Monsieur Veschambre, fait qu'il y a un certains nombre de mécanismes de stockage, de spéculation qui ne peuvent pas s'appliquer aisément. Je pense qu'on n'est pas exactement dans le même type de marché et donc on ne peut pas transposer directement d'un exemple à un autre.

SESSION 8

LOCAL F&V SUPPORT LOCAL IDENTITY OF FOOD PRODUCTION AND CULINARY CULTURE

Chair: **M. Chauvet**

- Introduction. **M. Chauvet**
- Does building of food identity favour local production? The Mediterranean case. **S. Abis**
- Cultural geography of the F&V. Some Mediterranean, African and Asian examples. **M. Chauvet**
- Combining traditional culture and modernity in the F&V sector: lessons from Japan. **T. Nishizawa**

Introduction

Michel CHAUVET

Agropolis International, Montpellier, France

Ce titre, "Les fruits et légumes, identité de production et identité culinaire" ne vient pas de moi, mais j'ai adhéré à l'idée au point que l'on m'a demandé d'assurer la présidence de cette session. L'idée est que dans l'évolution de la production et du commerce alimentaires, pendant des décennies, la tendance principale de l'amélioration des plantes et de l'industrialisation des filières s'est fondée essentiellement sur quelques espèces cultivées d'origine européenne. Ces espèces se sont ainsi mondialisées et sont maintenant commercialisées dans le monde entier, du fait de l'avance technique qu'elles ont prise sur les espèces locales des diverses parties du monde. De plus, elles ont suivi la tendance spontanée de l'économie mondialisée, à savoir la délocalisation. C'est un processus ancien. En France, au 19^{ème} siècle, les légumes étaient cultivés dans des ceintures maraîchères autour de chaque ville. Avec l'arrivée du chemin de fer à partir du milieu du 19^{ème} siècle, on a vu l'apparition de régions d'expédition, comme la Provence, le Roussillon et la région nantaise. La délocalisation a été encore plus loin dans les années 1950 avec le fret routier et le fret maritime réfrigéré, ce qui fait que c'est le sud de l'Espagne et le Maroc qui se sont mis à approvisionner l'Europe. On a donc assisté à une localisation des productions dans les zones qui étaient écologiquement ou logistiquement les plus à même d'avoir des avantages comparatifs.

Cette tendance peut continuer au niveau mondial, à moins que le prix de l'énergie n'arrive à la contrebalancer. Dans la mesure où les consommateurs auront la capacité de les payer, on pourra retrouver la même gamme de fruits et légumes dans les supermarchés de toute la planète. Est-ce un bien ? Personnellement je ne le pense pas ; le monde serait triste si en voyageant on voyait partout les mêmes choses et qu'on mangeait partout les mêmes aliments dans les restaurants.

Nous sommes à l'UNESCO, et il se trouve que l'UNESCO a adopté récemment une convention sur la diversité culturelle. Je pense donc qu'un des axes majeurs de notre réunion cet après-midi est que si nous voulons compenser ces tendances spontanées de la mondialisation, il faut s'appuyer sur des facteurs négligés jusqu'à maintenant, à savoir les différences culturelles et les produits de terroir. Nous allons donc essayer de voir en quoi les différences culturelles permettent de développer des gammes de fruits et légumes et des usages différents. Pour cela il existe des protections juridiques, en Europe en particulier on a les appellations d'origine, les indications géographiques de provenance, etc. Nos pays sont assez riches et bien dotés en élites intellectuelles et administratives pour se débrouiller. Je pense qu'on pourra développer des modes d'agriculture de terroir qui pourront au moins laisser des options par rapport aux tendances lourdes de l'agriculture. Le problème est

beaucoup plus difficile dans les pays du Sud qui sont faibles du point de vue financier, du point de vue de la gouvernance économique et politique et aussi du point de vue de tout l'accompagnement des filières. En fait, la plupart des produits locaux typiques voire endémiques de ces pays risquent d'être balayés par la mondialisation si on ne les accompagne pas pour les faire passer d'un stade de fabrication familial à un stade artisanal ou de petite industrie, puisque même les pauvres du Sud vivent maintenant surtout dans les villes et beaucoup moins dans les campagnes où l'on avait maintenu des savoir-faire et des productions locales. Quand la crise alimentaire a éclaté, j'ai été frappé de voir dans le journal "Le Monde" la photo d'un manifestant qui brandissait un pain lors d'une émeute de la faim à Dakar. Que le pain soit devenu le symbole de l'alimentation au Sénégal est lourd de conséquences, car le pain se fait avec du blé tendre, et le blé tendre doit être importé. Les céréales traditionnelles du Sénégal sont le riz, le mil, le sorgho, le maïs, mais certainement pas le blé tendre. Ils ont certes le droit de manger du pain, mais cela traduit une sorte d'aliénation culturelle, qui consiste à préférer la nourriture que mangent les blancs et les riches à celle que mangent les pauvres et les paysans. Au-delà de la question du statut social des aliments, se pose celle de la création et de l'évolution des filières locales, pour qu'elles puissent maintenir la diversité alimentaire, qui est à la fois une diversité culturelle et une diversité biologique. Pour revenir sur les céréales, j'ai appris récemment que si dans les villes d'Afrique de l'Ouest les consommateurs urbains ne mangent pas de mil ou de sorgho, c'est tout simplement parce que ces produits arrivent sur les marchés dans un état brut ; il faut alors procéder au pilage des grains ! Si le pilage se conçoit pour les femmes rurales, il n'est pas envisageable pour les femmes urbaines qui travaillent à l'extérieur. La solution réside dans la création d'entreprises de transformation, qui vendraient des céréales prêtes à la cuisson.

M. Abis va nous parler du cas des pays méditerranéens en insistant sur les aspects économiques qui nous indiquent les limites ou les contraintes très fortes qui s'appliquent à ces problématiques. J'interviendrai ensuite pour lancer quelques pistes et vous montrer que suivant les cultures du monde, on ne mange pas les fruits et légumes de la même façon. M. Nishizawa nous expliquera le cas du Japon qui est à mon avis exceptionnel parce qu'historiquement c'est le seul ou en tout cas le premier pays de culture non-européenne à avoir, grâce à ses capacités scientifiques et économiques, développé un certain nombre d'espèces qui sont endémiques ou typiques de la culture et de la cuisine japonaises. Je ne sais pas si on peut tirer des leçons du cas du Japon pour les pays en développement, mais cela permettra au moins d'ouvrir la discussion.

Does building of food identity favour local production? The Mediterranean case

Sébastien ABIS

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Permettez-moi d'abord de vous dire un mot sur le CIHEAM. Créé en 1962, le CIHEAM est aujourd'hui la seule organisation intergouvernementale en Méditerranée. Nous sommes 13 Etats membres du Nord et du Sud du Bassin, engagés sur la même volonté méditerranéenne, c'est-à-dire celle de la coopération en matière agricole, alimentaire et environnementale pour le développement de la région. Le CIHEAM, c'est un Secrétariat Général et surtout 4 IAMs, où se font les missions de formation et de recherche.



The International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
was founded in 1962.

It's an **intergovernmental organisation** comprising **thirteen member countries**
from the Mediterranean Basin

CIHEAM is made up of a **General Secretariat** based in Paris and
four Mediterranean Agronomic Institutes (MAI) located in Bari (Italy), Chania (Greece),
Montpellier (France) and Zaragoza (Spain).

In pursuing its three central missions (**education, research and cooperation**)
CIHEAM has come to be recognised as an authority in its fields of activity:
Mediterranean agriculture, food and sustainable rural development.

Symbole de notre activité de recherche pour l'action Mediterra, rapport annuel publié en 5 langues et construit par une expertise régionale mutualisée. Il me faut préciser que c'est la dernière édition 2008, consacrée aux futurs agricoles et alimentaires, qui m'a permis de bâtir la communication présente. Et celle-ci puise largement dans les travaux menés par mes collègues de l'Institut de Montpellier, à savoir Martine Padilla et Bénédicte Oberti.

Je vous propose trois temps pour articuler mon propos :

- 1- un cadrage rapide sur les fruits et légumes en Méditerranée ;
- 2- une analyse des grandes dynamiques à l'œuvre dans cette région concernant la consommation et les comportements alimentaires ;

- 3- un effort de prospective pour identifier quelques pistes pour agir dans cette Méditerranée en faveur d'une plus grande sécurité alimentaire.

I. Eléments de cadrage sur la situation en Méditerranée

Démographie

Rapidement vous rappeler que la zone méditerranéenne, c'est 450 millions d'habitants, avec de plus en plus de populations urbaines littorales.



Démographiquement, il importe d'insister sur une transition certes tardive mais terriblement rapide, avec une chute brutale de la fécondité, une émancipation économique des femmes et de profondes mutations sociales face à la modernité.

Dans ce paysage démographique là, bouleversé depuis une quinzaine d'années, vous comprendrez que les pratiques alimentaires se transforment et que la consommation évolue.

Production

En terme de production, il faut, après avoir souligné la grande particularité agro-écologique de la zone méditerranéenne, insister sur le poids tout à fait considérable de cette région dans la production des fruits et légumes.

En effet, le Bassin méditerranéen, c'est actuellement 16 % de la production mondiale de fruits et 13 % de celle de légumes. Toutefois, on observe une érosion dans le temps, face à la concurrence de nouveaux bassins de production comme l'Amérique du Sud et la Chine, puisque la Méditerranée assurait dans les années 1970 près de 30 % de la production mondiale en fruits.

Quelques exemples ici de produits emblématiques pour la région. Avec 85 % de la production mondiale de noisettes, 80 % des figues, 36 % des dattes, 52 % des abricots, 46 % des raisins de table, 1/3 de la production mondiale de pêche, 30 % pour les tomates et faut-il le rappeler un monopole méditerranéen sur l'huile d'olive avec 99 % de la production mondiale.

Parmi les grands producteurs de fruits et légumes, nous avons en Méditerranée d'abord la France, l'Espagne et l'Italie, ensuite la Turquie et après l'Egypte et le Maroc.

Changement climatique

3ème cadrage régional, avec un mot sur le changement climatique et les ressources naturelles. Vous n'êtes pas sans ignorer que c'est notamment en Méditerranée que se combinent le plus dangereusement impacts du changement climatique, raréfaction des ressources hydriques, érosion des sols et récurrence des sécheresses. Cette combinaison périlleuse bouscule en permanence la cartographie agricole des pays méditerranéens, et plus particulièrement ceux du Maghreb.

Et vous avez à ce niveau deux types d'illustration. En négatif, celle du Maroc qui se branche sur la production de banane dans les années 1980 pour constater ensuite que cela est fortement aquavore et pas vraiment stratégique pour la sécurité alimentaire du pays. On peut d'ailleurs sans doute se dire la même chose sur la fraise aujourd'hui. 2ème réaction face aux pressions environnementales, le cas de la Tunisie qui a récemment mis en place un système satellitaire assez performant pour cartographier agro-climatiquement le territoire.

L'Etat est engagé avec les professionnels et les producteurs pour concilier le choix des cultures avec le respect de l'environnement et l'impératif social du lieu de production.

Bref, on a en Méditerranée un potentiel agricole qui peu à peu s'affaiblit, inutile de se le cacher, mais aussi qui se recompose avec le changement climatique et les tensions sur les ressources. Pour les producteurs, c'est bien la complexité du comment produire plus mais mieux, c'est-à-dire en épargnant les ressources et en s'adaptant aux nouvelles conditions agro-climatiques.

Commerce

Dernier élément de cadrage régional, celui sur les enjeux économiques et sociaux de la libéralisation en cours des échanges agricoles entre l'Europe et ses partenaires du Sud.

On a tendance dans ce dossier à se noyer dans des peurs mutuelles entre les deux rives, avec ici en France, toujours cette impression de consommer de plus en plus de tomates marocaines alors que cette tomate est de plus en plus hollandaise en réalité. Notre IAM de Montpellier a conduit un programme important de recherches ces dernières années, Eumed-Agpol, pour examiner et modéliser cette libéralisation des échanges agricoles de fruits et légumes entre l'UE et les pays du Sud de la Méditerranée.

Toutes les estimations convergent pour souligner que le potentiel d'exportation des pays du Sud vers l'Europe est très limité et de plus en plus faible, tandis qu'à l'inverse, celui de l'Europe vers le Sud sera significatif et croissant.

L'impact socio-économique de cette libéralisation sera donc très fort pour les partenaires du Sud. Et le Nord de la Méditerranée ne doit pas redouter son voisinage méridional en terme de production fruitière et maraîchère, car la concurrence pour l'Europe se joue désormais ailleurs.

Et donc dans le débat agricole euro-méditerranéen, ne surestimons pas l'effet concurrence mais au contraire focalisons les efforts sur les complémentarités de ces deux zones voisines à l'échelle mondiale.

Après ces éléments de cadrage, pour diagonaliser un peu la problématique méditerranéenne, regardons désormais ce que cette région subit en terme de transformations alimentaires.

II. Consommation et comportements alimentaires

La Méditerranée est un carrefour pour les hommes et les cultures. Avec le temps, c'est une mosaïque alimentaire qui s'est dessinée avec pour seul dénominateur commun le fait que l'acte alimentaire est partout en Méditerranée une pratique sociale fondamentale et l'aspect hédonique reste important.

1. Mais aujourd'hui, vous avez en Méditerranée de profondes disparités en terme de consommation.

Disparités liées à des différences de niveau de vie toujours considérables, mais également disparités avec des préférences alimentaires qui sont différemment dictées en milieu urbain et parfois abandonnées en milieu rural.

Sur la rive Nord, on a une dérive alimentaire avec davantage de lipides consommés (produits laitiers, huile végétale...), plus de sucres aussi. Les plats méditerranéens, qui réclament fraîcheur et préparation, sont quelque peu délaissés.

Sur la rive Sud, les disponibilités alimentaires ont progressé mais on s'éloigne de plus en plus du modèle méditerranéen type, surtout dans les villes où les fast-foods

et la grande distribution ont fait une apparition récente mais très rapide désormais. Dans ces pays du Sud, on a donc visiblement une diminution globale dans la consommation des produits traditionnels, bien que l'intérêt pour ceux-ci reste manifeste.

2. Le résultat, c'est que nous avons une insécurité qualitative grandissante en Méditerranée. Les indices sur la qualité alimentaire des rations baissent, traduisant le développement d'un phénomène de malnutrition dans la plupart des pays de la région, qui après des années passées à veiller à la sécurité des quantités, en oublie aujourd'hui les risques santé d'une alimentation désordonnée car déséquilibrée.

L'accès aux produits favorables à la santé demeure difficile, comme l'atteste l'exemple de l'huile d'olive remplacée dans bons nombres de cuisines méditerranéennes par des huiles végétales comme le tournesol, car économiquement plus intéressantes.

Et pour refléter ces nouveaux comportements alimentaires, nous observons une explosion du surpoids et de l'obésité en Méditerranée. Un chiffre simplement pour notifier qu'à l'heure actuelle, au Maghreb, 20 % des enfants de moins de 5 ans se trouvent en situation de surpoids ou d'obésité. A l'horizon proche, ces populations méditerranéennes, si longtemps préservées des maladies chroniques alimentaires, vont devoir affronter, dans un contexte socio-économique déjà tendu, des charges de santé publique considérables.

3. 3^{ème} point sur ces pratiques alimentaires, pour constater à quel point un décalage est fort actuellement. Vous avez en effet d'un côté l'image de la diète méditerranéenne, officiellement reconnue comme modèle par l'OMS en 1996, prochainement inscrite au patrimoine mondial de l'Unesco et de plus en plus pratiquée de part le monde, notamment dans les pays anglo-saxons.

Et de l'autre côté, c'est-à-dire en Méditerranée, vous avez une dérive alimentaire, une malnutrition et des pratiques de consommation qui s'éloigne de la diète crétoise.

Tout cela est paradoxal et surtout préjudiciable puisque cette diète méditerranéenne semble incarner ce que la Méditerranée aurait d'universel, mais symbolise finalement l'impuissance des méditerranéens à valoriser leur patrimoine. L'économie mondialisée a pris à la Méditerranée ce qu'elle avait d'universel mais au lieu de la renforcer, cela a plutôt affaibli la Méditerranée. Si rien ne change, tendanciellement, les méditerranéens demain seront orphelins d'une diète alimentaire qui partout contribue à faire exister mondialement et positivement cette région.

III. Perspectives et invitation à l'action

1. La diffusion internationale de la diète méditerranéenne et ses produits associés ne signifie pas un accroissement des productions et un marché élargi pour les agriculteurs méditerranéens. Les produits dits méditerranéens se sont délocalisés, l'olivier aux Etats-Unis ou la tomate en Chine. Résultat, il faut creuser la question des zones de production, notamment dans un contexte où les consommateurs semblent de plus en plus sensibles au territoire, aux terroirs, donc à l'authenticité des produits.

Cela signifie qu'il conviendrait en Méditerranée de travailler sur la promotion des indications géographiques, comme outil de valorisation pour les terroirs et vecteur pour le développement local.

Cette dynamique ne peut être responsable que si elle s'inscrit dans les démarches de durabilité et d'équité sociale, tout en tissant davantage de passerelles entre l'agriculture et le tourisme dans cette Méditerranée où 1/3 des flux mondiaux de tourisme se concentre chaque année.

2. D'abord, sur des circuits courts, sur des marchés de proximité, donc sur le marché local international. Il faut là dessus progresser en terme de logistique et de stockage pour surtout toucher les zones urbaines et reconquérir l'estomac des méditerranéens avec des produits traditionnels et de qualité, dont bien entendu les fruits et légumes.

C'est à ce titre qu'il faut faire de la grande distribution qui s'implante en Méditerranée un allié plutôt que l'épouvantail de tous les maux. Les pouvoirs publics pourraient s'associer avec le privé pour mettre à disposition du plus grand nombre une gamme étendue de produits méditerranéens (subventions, TVA inversée). 2^{ème} axe : ensuite, il faut pour ces produits trouver un débouché sur l'international. Pour protéger les savoir-faire, les recettes et les produits spécifiques de la Méditerranée, l'une des options serait de créer un label produits terroirs de la Méditerranée. Ce label essentiellement marketing, serait une ombrelle aux labels existants comme les IG et aurait à répondre au triple objectif de l'identité, de la qualité et de la sécurité de la production. A travers cette démarche globale, mixant reconquête des marchés méditerranéens locaux et extension des débouchés internationaux, c'est le patrimoine et le potentiel agro-alimentaire méditerranéen qui en serait dynamisé.

3. Cela signifie, dès l'enfance, construire des politiques d'éducation à l'alimentation dans une optique de santé publique ; de santé publique globale en effet, car bien se nourrir aujourd'hui, c'est construire une assurance-vie complémentaire sur l'avenir. Et un consommateur informé, éduqué, en sera plus exigeant sur la qualité et l'authenticité des productions.

Conclusion

Pour conclure, il faut sans doute appeler, quand on s'interroge sur le développement de la Méditerranée et sur les solidarités à y promouvoir, à davantage articuler politiques agricoles, politiques environnementales, politiques santé et politiques éducatives.

Outre la responsabilité alimentaire du consommateur, il est certain qu'il ne faudrait pas, contexte actuel oblige, dénigrer la dimension qualitative de la sécurité alimentaire. Celle-ci doit conjuguer des aspects quantitatifs certes, mais avec impératif de qualité des produits consommés.

Finalement, consommer méditerranéen, c'est défendre des produits régionaux, contribuer à la durabilité culturelle et environnementale de la zone, enclencher de nouvelles dynamiques socio-économiques et s'engager sur la voie d'une santé publique plus sûre.

Cultural geography of the F&V. Some Mediterranean, African and Asian examples.

Michel CHAUVET

Agropolis International, Montpellier, France

Parler de géographie culturelle des F&L est bien ambitieux, et j'aborderai cette problématique par quelques exemples, qui montrent que les préférences culturelles peuvent contribuer au maintien de produits locaux, et que la banalisation liée à la mondialisation des échanges n'est pas inéluctable.

Je prendrai d'abord l'exemple des radis et des oignons. Il y a trente ans, je conseillais les exportateurs français de fruits et légumes, et on se préoccupait alors beaucoup de la concurrence néerlandaise. Les Néerlandais sont connus pour leur dynamisme en matière de légumes. Ils ont donc importé de Floride un mode de production industrielle de radis. Il s'agit de petits radis ronds rouges, récoltés mécaniquement, équeutés et mis en sachets plastiques. Les Hollandais ont créé des machines plus petites adaptées à une production sous serre et mis au point un emballage attrayant (des papillotes). Cela leur a permis de conquérir le marché allemand, mais ils se sont cassé les dents sur le marché français. Pourquoi ? Tout simplement parce que les Français tiennent à leurs radis demi-longes roses à bout blanc, avec en plus des préférences régionales sur la forme et la couleur du radis. De plus, ces radis doivent être vendus en feuilles, ce qui les déshydrate rapidement. Ils doivent donc être très frais pour rester vendables, et sont restés des productions maraîchères à un niveau local ou régional, résistant ainsi à la mondialisation. A la même époque, j'ai assisté à la déferlante des oignons néerlandais. Ceux-ci étaient produits dans les nouveaux polders, où l'on avait créé *ex nihilo* des exploitations agricoles de taille optimale disposant des meilleurs équipements de l'époque. Ils ont ainsi conquis le marché mondial et quasiment éliminé la production française. Mais, car il y a un mais, il s'agissait du type d'oignon dominant sur le marché, l'oignon sec et fort. Restaient quelques produits locaux. L'un d'eux était l'échalote rose, qui venait de faire l'objet d'innovation culturelle (la culture sur plastique au sol) et biologique (l'usage de semences dévirosées). Le Val de Loire puis la Bretagne ont rapidement développé cette production. Par ailleurs, il subsistait quelques petites zones en France où on produisait de l'oignon doux. Ce produit est plutôt un légume qu'un condiment, et les Méditerranéens l'apprécient pour le manger cru en salade. Ces oignons doux sont maintenant relancés comme produits du terroir (oignon doux des Cévennes, cèbe de Lézignan...). Non seulement ils font l'objet de préférences locales, mais ils sont aussi plus périssables que les oignons forts, donc moins faciles à gérer dans le grand commerce. Enfin, je mentionnerai un produit qui me tient à cœur, l'échalote grise, qui pour moi est la seule vraie échalote (et d'une espèce botanique distincte), et que l'on trouve surtout dans l'Ouest de la France, un peu dans le Sud-est, et en Italie où elle s'appelle *scalogno di Romagna*. Cette échalote a un goût prononcé et obtient des

prix élevés, mais n'est pas toujours facile à trouver. Au travers de ces exemples d'importance économique inégale, on voit que la diversité culturelle et la relance des terroirs permet, dans certaines conditions, de maintenir des productions et des marchés locaux.

Si on observe un pays voisin, l'Italie, on ne peut qu'être émerveillé de la diversité de leurs légumes. Les choux-fleurs ont des couleurs différentes d'une région à l'autre, le Romanesco en étant un exemple. Les chicorées exhibent aussi une grande diversité. L'une d'elles, appelée *puntarelle* (1.), est une chicorée amère qui a un plateau basal



1. « Puntarelle »
Cichorium intybus



2. « Radicchio »
Cichorium intybus



3. « Cavolo nero »
Brassica oleracea



4. « Trombette »
Cucurbita pepo



5. Mauve ; Mallow
(à Kairouan)
Malva verticillata

très large d'où émergent un grand nombre de tiges creuses ; ce sont elles que l'on mange, et non les feuilles. Coupées en fines lanières et mises dans l'eau où elles s'entortillent, elles sont ensuite accommodées en salade avec une sauce aux anchois, ce qui constitue un mets excellent. Ce produit et cette recette sont à ma connaissance connus uniquement en Italie. On trouve aussi les chicorées rouges ou *radicchio* (2.), dont il existe plusieurs types. L'Italie a même domestiqué des plantes en plein 20^{ème} siècle. *Diplotaxis tenuifolia* par exemple, est un substitut de la vraie roquette *Eruca vesicaria*, et se trouve fréquemment dans les marchés et restaurants italiens. De même, *Salsola soda*, appelé *roscano* ou *barba del sultano*, ou soude en français, est un légume bizarre, dont les feuilles cylindriques ressemblent vaguement à des haricots verts fins, et se mangent juste ébouillantées.

Un chou endémique de l'Italie est le chou palmier ou *cavolo nero* (3.); on le trouve uniquement en France dans les "potagers de curieux". Si l'on connaît la courgette (de l'espèce *Cucurbita pepo*), qui a dû apparaître en Algérie à la fin du 19^{ème} siècle, les Italiens ont innové en utilisant comme courgette d'autres types de courges de l'espèce *Cucurbita moschata*, les *trombettes* (4.).

Si l'on va dans l'est de la Méditerranée, on trouve un légume bizarre qui s'appelle en arabe *meloukhia*, et en français corète ou mauve des juifs. Il s'agit de *Corchorus olitorius*, que l'on connaît comme plante à fibre sous le nom de jute. C'est un accompagnement typique au Liban, en Egypte, mais aussi en Tunisie et dans toute l'Afrique tropicale. La caractéristique de ce légume feuille, qui est souvent desséché et moulu, c'est d'être très mucilagineux. Ce goût mucilagineux se retrouve chez une autre espèce consommée aussi en Egypte, en Tunisie, qui est la mauve, *Malva verticillata* (5.). La mauve était un légume apprécié dans la Rome antique ; on la voit parfois en Italie, ainsi elle a pratiquement disparu d'Europe en tant que légume. J'attribue cette disparition à la répugnance que les Européens ont acquise vis-à-vis de la texture mucilagineuse, alors que l'attrance pour cette texture s'est maintenue dans certaines

régions comme l'Afrique. Dans l'est de la Méditerranée, on trouve aussi toute une famille de recettes de légumes farcis qu'on appelle en turc *dolma*. On connaît surtout les feuilles de vignes farcies au riz, mais on peut faire aussi des feuilles de choux farcies ou utiliser des poivrons ou des aubergines. Pour en disposer toute l'année, les Turcs, par exemple, évident des aubergines et les font sécher ; on les trouve vendues en chapelet dans les épicerie fines de Paris. Quant au poivron, le type préféré dans les Balkans est le 'Hungarian wax', qui a une couleur jaune clair et surtout une forme en cône étroit. Sa taille moyenne permet au goût du poivron de bien diffuser dans la farce. On a là un exemple de l'adéquation entre une recette de cuisine basée sur une tradition culinaire et un type variétal au sein d'une espèce.

Si on passe à l'Afrique tropicale, on peut s'appuyer sur un inventaire récemment publié par PROTA (www.prota.org), auquel j'ai participé. J'ai été frappé du grand nombre d'espèces utilisées comme légumes (275), et de la proportion de celles qui sont cueillies à l'état sauvage (la moitié), ou bien récoltées dans les champs comme adventices, avec des statuts divers qui vont de l'adventice tolérée à l'adventice favorisée puis à l'espèce proto-domestiquée. Du point de vue culinaire, les légumes sont souvent consommés en sauce, qui sert d'accompagnement à un féculent, celui-ci pouvant être du riz, du manioc, du mil, du sorgho ou du maïs. Pour faire la sauce, on peut les conserver en les desséchant et les réduisant en poudre. Ensuite, on les réhydrate et on les cuisine avec d'autres ingrédients. Deux types de goûts sont recherchés : l'amer et le mucilagineux. L'amertume est apportée par exemple par l'aubergine africaine, *Solanum aethiopicum*, qui ressemble à une tomate et devient rouge vermillon à maturité. Cette aubergine peut difficilement s'utiliser comme notre aubergine (*Solanum melongena*), et son amertume est compensée par le goût des autres ingrédients de la sauce. Un autre exemple de légume amer est *Vernonia amygdalina*, qui est un légume feuilles dont on fait un plat réputé, le ndolé.

Pour ce qui est de la texture mucilagineuse, on retrouve la corète et le gombo. Or en Afrique noire, on ne mange pas les mêmes types de gombo que dans la Méditerranée. Dans la Méditerranée, on préfère les gombos de forme allongée et qu'on récolte très immatures parce qu'on les consomme comme légume, un peu comme des haricots verts. Par contre en Afrique, on cherche plutôt des formes trapues que l'on cuisine à un stade plus mûr et qui sont très mucilagineux. A titre d'anecdote, mon fils a été récemment avec ses amis dans un restaurant africain et a remarqué un plat de gombo sur le menu. Comme il est aussi intrépide que moi en matière culinaire, il en a demandé. Le serveur l'a mis en garde, en lui précisant que c'était plutôt un plat pour les Africains, mais pas pour les Européens. Il a bien sûr insisté. Son plat s'est révélé tellement mucilagineux qu'il a provoqué chez mon fils une réaction de dégoût qu'il n'a pu surmonter. Au travers de ces exemples, on voit que les goûts et les dégoûts peuvent varier énormément d'une culture à l'autre, ce qui a des influences sur toute la filière finalement et dont il faut tenir compte.

Au sein d'un même groupe d'espèces, on peut trouver une grande diversité, comme le montre la photo ci-joint, qui illustre la collection d'aubergines du château de Valmer, près de Vouvray, qui détient actuellement une des meilleures collections de légumes en France. En Indonésie, on consomme par exemple de petites aubergines crues, avec d'autres légumes crus. C'est surprenant, mais acceptable pour un palais européen. Dans d'autres pays, on les conserve en saumure, ce qui garde leur consistance croquante.



Passons maintenant en Chine. Comme le savent les habitués des restaurants chinois, un Européen est souvent dérouté à la fin du repas, car il n'y a pratiquement pas de dessert. Il y a des fruits, litchis, longanes ou "fraise chinoise" (*Myrica rubra*), mais aucun dessert vraiment sucré, ce qui constitue habituellement le point d'orgue d'un repas européen. Si l'on observe la gamme des fruits asiatiques, on ne peut que conclure que le goût sucré n'est pas nécessairement recherché. Dans les supermarchés chinois de Paris, on trouve par exemple des goyaves, mais ce sont des fruits énormes, verts et durs ! Autrement dit, ils sont consommés plutôt comme légume et appréciés pour leur caractère croquant, car ils sont trop immatures pour mûrir à la maison. Ce qui est surprenant pour nous, car les arômes de la goyave se développent quand elle est très mûre. De même, la papaye est appréciée verte, au point que la salade de papaye verte constitue l'un des meilleurs plats thaïlandais. Je citerai aussi le nashi, que les arboriculteurs français se sont efforcés d'introduire en Europe. Cette tentative s'est soldée par un échec, simplement parce que le nashi ne correspond pas au goût européen, qui attend d'un fruit qu'il ait du goût, or le nashi en a peu. Par contre, il est croquant et très juteux. Cela suffit à le faire apprécier des Asiatiques, dont les conceptions culinaires s'appuient sur des jeux d'oppositions de texture, de couleur et de goût (y compris l'insipide). Maintenant, on revoit le nashi, mais dans les supermarchés chinois, où il est acheté avant tout par des Asiatiques.

Dans le domaine des légumes, mes premiers essais culinaires ont été des fiascos, simplement parce que je cuisinais à l'européenne, où l'on cuit longuement les légumes. En fait, tout se passe comme si les légumes chinois étaient adaptés à leurs modes de cuisson et de consommation, autrement dit à peine saisis au wok, ou à peine cuits à la vapeur. Il est assez surprenant de constater que deux plantes botaniquement proches, le chou européen et le chou chinois, sont adaptés à des modes de cuisson opposés. Je ne peux enfin m'empêcher de citer des plantes qui ne sont pas des fruits et légumes, mais des céréales. On connaît le riz gluant, mais dans les zones montagneuses d'Asie du Sud, les populations locales ont une telle attirance pour la texture gluante qu'elles ont sélectionné des types gluants dans la plupart des céréales. Il y a ainsi des millets gluants, des sorghos gluants et même des maïs gluants. Ce dernier fait a longtemps constitué un mystère pour les botanistes. En

effet, ce type de maïs, connu sous le nom de waxy par les techniciens, est inconnu en Amérique Latine, où se trouve le centre d'origine du maïs. L'existence en Asie de ce maïs gluant a longtemps été un argument en faveur d'une possible présence du maïs en Asie bien longtemps avant Christophe Colomb. Cela montre en fait que la sélection populaire peut être très efficace, et qu'en quelques dizaines d'années, de nouveaux types variétaux peuvent apparaître quand les paysans ont un intérêt culturel marqué en faveur d'un caractère particulier.

Quelques mots sur le Japon pour finir. En observant la cuisine japonaise, plus encore que pour la cuisine chinoise, on est frappé par le fait qu'elle joue sur toute une gamme d'oppositions. Ce n'est pas seulement de l'art, c'est également de la technique très élaborée. Un aliment japonais ne prend son sens qu'en association avec d'autres. Il faut des oppositions de couleurs : le blanc du riz, le noir des algues, le rouge du shiso, le vert du wasabi ; il faut des associations de textures, avec des aliments mous, d'autres croquants ; il faut des associations de goût, le tofu insipide, le gingembre cru et piquant... Jamais le mot de Lévi-Strauss n'aura été plus vrai : "Un aliment doit être non seulement bon à manger, mais aussi bon à penser".

Pour le futur, que peut-on tirer de ces quelques éléments ? C'est que la mondialisation peut certes promouvoir des recettes uniformes. On a parlé de la *mcdonaldisation*, quoique le hamburger ait contribué à faire connaître en France les graines de sésame. Mais dans le même temps, les migrations humaines et la mondialisation des transports nous donnent accès à des cuisines du monde entier. Cela donne des occasions à des produits locaux de se maintenir et de se développer. La cuisine permet aussi le dialogue interculturel. Le monde serait bien triste si on devait manger partout les mêmes plats. La promotion de cette diversité culinaire est l'une des priorités du mouvement Slow Food, dont le slogan est maintenant que les aliments doivent être bons, propres et justes. J'ajouterai qu'ils doivent être divers. De ce point de vue, les réglementations peuvent avoir des effets pervers. Les appellations d'origine contrôlée, qui constituent un outil majeur de promotion des produits locaux, passent par exemple par la définition d'un cahier des charges. Or ce cahier des charges va s'imposer à tous ceux qui veulent l'appellation, et exclure ceux qui sont en dehors de l'aire d'application de l'appellation. Cela entraîne l'élimination des produits variants, dont certains pouvaient avoir un intérêt.

Pour promouvoir ces produits locaux, il faut bien entendu les documenter, les décrire, recueillir les recettes. Ce travail d'inventaire, que mènent les anthropologues de l'alimentation, reste parcellaire. Il faut aussi analyser les processus d'élaboration des produits, pour identifier les facteurs de blocage et aider ces produits locaux à s'adapter, à passer d'un stade quasiment familial à un stade artisanal ou de petite industrie. Ce n'est que de cette façon que les produits locaux peuvent devenir disponibles sur les marchés des villes. Cela peut passer par l'amélioration génétique des plantes locales, l'amélioration des techniques de production, une certaine forme

d'industrialisation des processus et enfin des mesures de protection, comme les AOP, IGP ou autres. Mais il n'est pas sûr que ces actions soient suffisantes, parce qu'on doit faire face à des forces d'imposition culturelle ; quand on est citadin et qu'on a un peu de moyen, on veut manger comme les riches des pays développés, et on délaisse les aliments des pauvres et des ruraux. C'est ce qui explique par exemple la désaffection des légumes secs en Europe.

Pour finir, la critique majeure que je fais à la notion de diète méditerranéenne est justement qu'elle se fonde sur le régime alimentaire des Crétois ruraux. Or non seulement ces populations vivaient à la campagne, mais elles étaient également pauvres. Notre problème est bien différent. Comment faire pour que des urbains un peu plus riches conservent le régime alimentaire des ruraux pauvres ? Je n'ai pas la réponse, Mais je constate avec les anthropologues que riches et pauvres partagent largement les mêmes schémas culturels. Les pauvres n'ont simplement pas les moyens de manger de la viande, mais dès qu'ils en ont les moyens, ils le font. Rappelons-nous qu'il n'y a pas si longtemps, les paysans français allaient vendre leurs poules à la ville. La "poule au pot" ne se mangeait que dans les grandes occasions.

Il nous faut donc accomplir une véritable mutation culturelle. Pendant des millénaires, notre alimentation nous était largement imposée par des contraintes écologiques et économiques. Nous avons maintenant l'embarras du choix. Ce choix se portera sur des produits frais ou traditionnels seulement si ceux-ci acquièrent un statut social et culturel élevé. Si on éprouve du plaisir à faire la cuisine et à manger des aliments goûteux et diversifiés, s'il devient chic d'en parler, on aura fait la moitié du chemin. Restera aux filières économiques d'accompagner ces tendances et de s'y adapter.

Q&A

PUBLIC (Président de l'interprofession INTERFEL) : Ma question est un peu politique, j'ai assez épousé votre analyse des différents modèles simplement j'aimerais de votre part une réponse un peu plus précise qu'il y a, au-delà des vœux pieux, une extraordinaire contradiction entre les données économiques et financières notamment par rapport à la distribution, au cahier des charges de la grande distribution. Je vais prendre un seul exemple, c'est l'exemple des clubs pomme qui ont une dimension mondiale sur un certain nombre de variétés et les logiques un peu comme les vôtres qui émanent un peu des intentions culturelles. Le patrimoine français de la pomme en 2000 était de 3000 variétés, je pense que l'INRA, excusez-moi, n'a pas fortement contribué à maintenir un certain nombre de variétés qui étaient en totale adéquation avec des attentes de consommateur notamment sur le goût. Comment dépassez-vous, par rapport à ce que vous avez dit tout à l'heure, cette contradiction entre des vœux pieux qui s'expriment, je pense, par rapport à des

logiques culturelles, socioculturelles, et puis les raisons économiques et financières qui vont complètement a contrario par rapport à ça ?

M CHAUVET : Vous remarquerez que j'ai mis quelques bémols à mes propos. Yves Lespinasse nous a parlé des actions en faveur de la diversité génétique fruitière. C'est un des domaines où l'INRA a eu une politique constante d'inventaire et de maintien des ressources génétiques, mais aussi d'amélioration des plantes avec un objectif de qualité gustative. En témoignent la fraise Gariguet, les pommes Chanteclerc et Ariane, la poire Angélys.

PUBLIC (Président de l'interprofession INTERFEL) : Pour être plus précis Monsieur (...), la dernière variété de tomate qui a été trouvée en 1966 est la Montfavet, expliquez moi sur quel matériel végétal nous travaillons aujourd'hui dans le cadre de l'expérimentation appliquée sur la tomate en France sinon qu'à partir de deux laboratoires fondamentaux qui sont ou israéliens ou hollandais ? Comment, à partir de matériels végétaux qui quelque part me semble-t-il ne traduisent pas les sensibilités que le consommateur français dans tout ce que vous avez exprimé au niveau des logiques de goût, culturel etc. correspondre ? Vous avez donné l'exemple hollandais sur l'oignon, je voudrais la même chose sur la tomate, on n'est pas du tout sur du matériel végétal en conformité avec nos attentes. Je n'ai pas connaissance que l'INRA ait eu sur ces questions là une politique volontariste par rapport à la recherche.

M CHAUVET : Je suis un peu mal placé pour répondre à cette question complexe, et je préférerais que Bernard Chevassus le fasse.

B CHEVASSUS-au-LOUIS : Je ne voudrais pas qu'on développe ici un débat trop franco-français. Je pense, et qu'on ne joue pas à renvoyer des balles, qu'il y a eu une période quand même dans laquelle on considérait que le fait que la recherche publique créait des variétés était, disons, de la distorsion de concurrence par rapport à la concurrence privée donc certains ont dit à la recherche publique, on pourrait aussi le dire au Canada et dans d'autres pays pas uniquement en France qu'il était pour le moins urgent que la recherche publique se désengage de la création variétale. On peut reposer la question aujourd'hui dans la mesure où on comprend mieux je pense ce que fera ou ne fera pas la création variétale privée et on sait en particuliers que 80% du chiffre d'affaire des semenciers privés va se concentrer sur les 4 majeurs que sont le maïs, le soja, le coton et un peu secondairement le colza. Par rapport à ça si on estime qu'effectivement un effort public doit être fait non seulement dans la conservation des ressources mais dans la création de variétés adaptées, il faut effectivement repenser globalement notre système de recherche et développement. Je ne détaille pas davantage mais je voulais rappeler cet élément d'histoire. Je ne prends qu'un exemple très concret pour ceux qui la connaissent, il y a une fraise qui s'appelle Gariguet que l'INRA avait obtenu, cette fraise n'a connue de succès

commercial que pratiquement 1 ans avant la fin de l'obtention de la licence INRA donc elle était restée pendant près de 20 ans dans les placards et non-utilisées par les producteurs mais encore une fois ce ne sont que quelques éléments histoire de garder des relations amicales.

PUBLIC (Jean SALLE, producteur de légumes à Perpignan, Président de VINIFLORE, Conseil Plénier) : Juste une observation sur le cap qu'il y a en ce moment INRA a obtenu cet énorme succès sur la fraise par anticipation non-exploitée mais dans le moment où cela a été effectivement exploité. Peut-être que l'INRA était extraordinairement en avance, probablement d'ailleurs, peut-être que les professionnels étaient extraordinairement en retard, très probablement aussi d'ailleurs. C'est dommage que la recherche n'ait pas fini de faire comprendre effectivement les avancées qu'elles avaient faites, qu'elles n'aient pas été capables peut-être aussi de faire comprendre qu'il y avait quelque chose à faire là. En tout cas, autant il serait négatif de dire que l'INRA a été trop en avance, ça serait négatif de dire que les professionnels étaient trop en retard, le sujet ici je crois, c'est de dire comment faisons nous pour qu'un tel gaspillage ne se reproduise pas. (...) Je crois que je rejoins en ça quand le président de l'interprofession fait part de ces interrogations.

M CHAUVET : si on prend l'exemple de la fraise, je ne suis pas sûr qu'il y ait eu vraiment un gaspillage. Quand l'INRA a arrêté son travail sur la fraise, le matériel génétique a été remis à un centre interprofessionnel, le CIREF, qui a continué l'effort d'amélioration des plantes. Cela a donné entre autres les variétés Ciflorette et Cigaline. Mais le problème, c'est qu'il faut raisonner au niveau de toute la filière. Il suffit qu'un des maillons de la filière soit défaillant pour que l'innovation ne se fasse pas. Il y a trente ans, l'expédition et la distribution considéraient que la diversité des fruits et légumes, multipliée par la diversité de leurs spécifications commerciales, était trop difficile à gérer, sans parler de la périssabilité des produits. On a donc cherché à diminuer le nombre de références. Par ailleurs, le consommateur garde l'impression qu'en achetant un fruit ou un légume, il achète un produit, et il ne comprend pas que ce produit ait un prix aussi bas bord champ et un prix aussi élevé en rayon. Or tout économiste vous dira qu'il n'achète pas un produit mais un service. Il y a un monde entre le rural qui récolte dans son jardin ou achète à des producteurs voisins, et le citadin qui vit dans une mégapole et achète des produits qui viennent de régions d'expédition lointaines. Cela pose des problèmes de logistique considérables.

Mais on constate des évolutions intéressantes, avec l'apparition de circuits courts et un intérêt grandissant des consommateurs pour la diversité. Après une phase "tout Golden", on a maintenant une gamme assez diversifiée de pommes. La situation s'est donc améliorée. Pendant des décennies, la concurrence portait sur les prix. Maintenant, elle porte aussi sur la diversification, et c'est excellent. Je dirai, en tant

que citoyen, que l'important est que l'on veille à maintenir des options, que l'on ait le choix entre des produits chers et bon marché, et entre divers modes de distribution. Souvent, la grande distribution ne sait pas gérer un rayon fruits et légumes, car ce sont des produits périssables. Pourquoi ne pas prévoir alors qu'un détaillant spécialiste s'installe dans les centres commerciaux ? Dans certaines régions, les hypermarchés ont décidé de ne pas avoir de rayon poissonnerie ou boucherie ; mais on trouve des spécialistes dans le centre commercial, et le consommateur sait donc qu'il trouvera tous les produits qu'il cherche. De plus, il apprécie d'avoir un rapport humain avec un détaillant et de pouvoir lui faire des remarques sur ses produits, chose bien plus difficile dans un hypermarché anonyme. Il y a toute une réflexion de fond à mener sur la distribution. Si l'on veut que le consommateur mange davantage de F&L frais, il faut bien sûr qu'ils aient un prix abordable, mais surtout qu'ils aient du goût, que l'on sache dans quelles conditions ils sont produits, d'où ils viennent, etc. Le consommateur devient exigeant et compétent, et la filière doit faire de même.

PUBLIC (Mariano WINOGRAD d'Argentine) : Ceci n'est pas une question mais une suggestion. Le débat est très intéressant mais pour nous qui ne sommes pas d'ici nous ne connaissons pas vos noms et professions.

PUBLIC (Jean SALLE) : Je suis Jean SALLE producteur de légumes à Perpignan, Président de VINIFLORE, Conseil Plénier. Simplement je voudrais dire, puisque j'ai la parole, Monsieur Chauvet, Monsieur le Président, Monsieur Chevassus-au-Louis, je n'étais pas du tout critique tout à l'heure lorsque je parlais de gaspillage, il n'y avait aucune notion de valeur, c'était un simple constat qui me semble-t-il pouvait apporter quelque chose qui est de dire, comment se fait-il que nous ayons pu, malgré nous, malgré nos savoirs et nos bonnes volontés, malgré le nombre de spécialiste qu'il y a, comment se fait-il que nous n'ayons pas abouti et que finalement on ait perdu du temps entre le moment où cette fraise qui était extraordinaire, la Gariguette et le moment où on l'exploite on est pu perdre 15 ans ou quelque chose comme ça. C'est une erreur de nous tous ou en tout cas un constat de notre propre incapacité probablement de la filière ou des filières à la fois de la recherche, à la fois des chercheurs qui trouvent et de ce qui est exploité. Avant d'apporter les réponses il me semble qu'il est essentiel que l'on s'entende sur les questions que nous devons nous poser parce que nous sommes ici finalement pour dire, comment se fait-il que les fruits et légumes qui sont une part des produits alimentaires si essentiels semble-t-il à la santé, il me semble que tous le monde soit à peu près d'accord, cette réponse alimentaire si positive, comment se fait-il qu'il y ait à la fois ça et une obésité qui ne fait que galoper et comment se fait-il effectivement que malgré cette qualité là, tant de producteurs de fruits et légumes autour de grandes villes disparaissent qui font que probablement cette ressource taris plus vite que d'autres productions en tout cas en France et que l'on soit désormais obligé de les importer de beaucoup plus loin alors que nous savons ce que devient le climat en tout cas les interrogations que nous avons dessus, ce que devient l'eau, ce que devient le coût du pétrole, pourquoi ne

sommes nous pas meilleurs sur ce plan là. Voilà pourquoi je dis qu'il est important de voir nos difficultés, nos propres défauts.
(...)

Combining traditional culture and modernity in the F&V sector: lessons from Japan.

Takashi NISHIZAWA

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M CHAUVET : Ce qui m'intéresse depuis longtemps avec le Japon, comme je l'ai dit ce matin, j'ai fais la liste légumières endémiques pratiquement du Japon qui sont totalement inconnues en dehors et qui sont apparemment très appréciées, qui ont été sélectionnées etc. au Japon je trouve ça très étonnant et je pensais que c'était un exemple qui méritais d'être analysé et qu'on voit comment le Japon a justement su, le titre l'indique, combiner à la fois un maintien très fort d'une identité culturelle très forte et en même temps une grande modernité comme on sait et en particulier dans le secteur des fruits et légumes. (...)

T NISHIWAWA: I will introduce the traditional fruits and vegetables in Japan, especially how they have been used in the history of Japan in relation to Japanese culture, and also how they are used now.

Japan has a long history, and the food culture was created independently from other countries. The food culture of Japan reaches the Jomon era which is from approximately 14'000/400 BC. Very primitive production of some wild vegetables and fruits productions also started in 'Jomon' era. At the end of Jomon era, rice plant was introduced to Japan mainly through China and Korean. The introduction of rice was a big impact for the culture of Japan because of settled life of ancient Japanese, followed by the foundation of country.

The next to 'Jomon' era is called as the 'Kohun' era (3rd-6th Century). During the 'Kohun' era, the Japanese Imperial Court made a chapel in 'Yamato' province and the Yamato clan decided the Shinto as a national religion. 'Shinto' is the Native-Japanese religion; it is a type of polytheism and a mystic beliefs system. For instance, this cedar tree (1) is over 1'000 years old and people are still afraid of cutting the trees because of the existence of spiritual things inside of the trees. Thus, 'Shinto' largely affected the lifestyles of Japanese people including eating habits.



1. An old cedar tree, Yamagata

In the 'Asuka' era (6-8th Century), Buddhism was introduced to Japan and the philosophy was mixed with that of 'Shinto'. As the results, many taboos were decided for the consumption of foods, especially for meat eating. For example, in 675 AD, the Emperor 'Temmu' decreed the prohibition on the consumption of meat. In the 8th Century, many additional decrees were made by Emperors on the banned of killing any animals, sometimes even fishing. From such a eating habit, 'Syojin-ryori', a

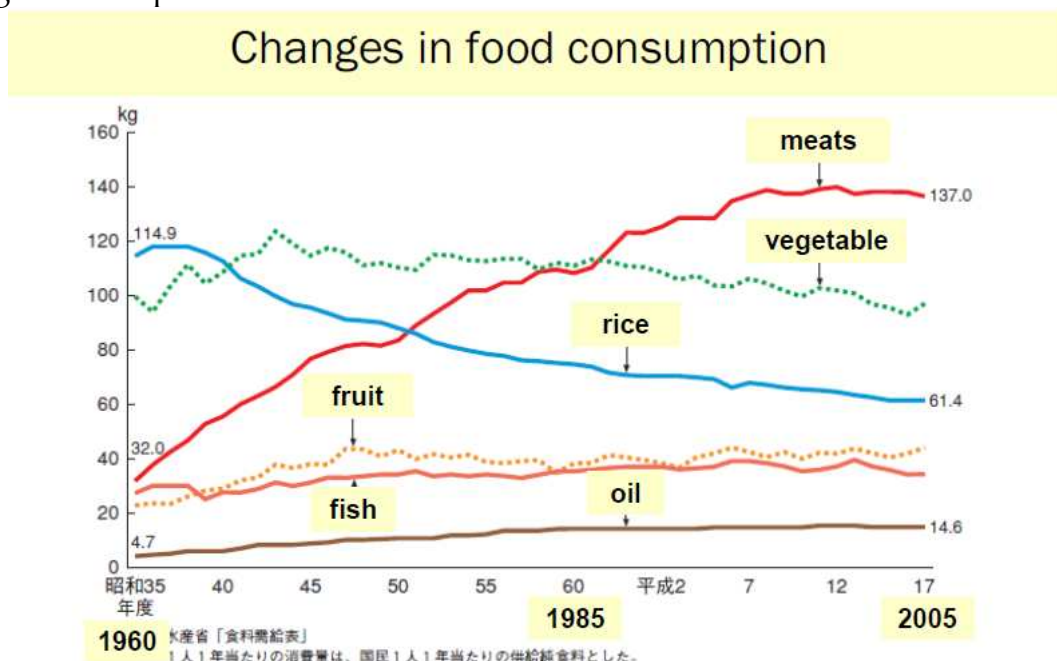
famous Japanese dish, was born in this era as a vegetarian dish for the Buddhist monks. 'Syojin-ryori' became an origin of the Japanese cuisine.

In the 16th Century, people started to eat 'Tempura' that was originally introduced to Japan by the early Portuguese. 'Tempura' was modified as a vegetarian style because people carefully avoided meat eating.

In the 'Edo' era (17th-19th Century), Japan closed itself off from the outside world. This policy was called 'Sakoku' which means to break relations from other countries and under the 'Sakoku' policy, no foreigners or Japanese could enter or leave the country on the penalty of death. The policy was conducted in 1633 and continued for 235 years until 1868. During the 'Sakoku' period, Japanese traditional foods such as 'Sushi', 'Soba' was established.

Japan modernization began in mid 19th Century when Japan blocked off all intercourse with foreign countries. A lot of new crops and western cuisines were introduced and Japanese people were allowed meat eating. However, even under such conditions, common people continued the same lifestyle as the 'Sakoku' period. Westernization began after the World War II, when American dietary habits were introduced in Japan, and the habit spread rapidly throughout Japan. For instance, Japan MacDonaldd was founded in 1971 and now it shares 12.5% of the worldwide sales that was the second biggest consuming country.

Because of the changes in the dietary habits, Japan largely expanded the meat consumption. As you see in this figure, meat consumption increased almost four times between 1960 and 2005 while rice consumption decreased to almost half level during the same period.



Because of the crisis of rice consumption, we started to re-evaluate Japanese traditional eating habit since 1970's. This photo (2) is a dinner menu in my house. As you see, Japanese people still eat a lot of indigenous crops. Another example is 'Soba' (3) which was also completed in the 'Edo' era. 'Soba' was one of the fast-food because it was quickly cooked and served. Even now, many Japanese workers eat Soba at lunch time.



3. Soba noodle.



2. A typical dinner menu.

Here, I will introduce what kind of indigenous vegetables and fruits Japanese people have utilized.



4. *Wasabia Japonica*

'Wasabi' (4) is the most famous indigenous vegetable in Japan because it is used as a spice for 'Sushi'.

This is 'udo' (5) which is a young sprout of a woody plant. In spring, people to mountain for the collection of edible mountain crops such as 'udo'.

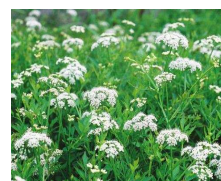


5. *Aralia cordata*



6. *Petastes japonicus*

'Fuki' (6) is a plant which belongs to *Asteraceae* family. Young inflorescence of the 'fuki' emerges in early spring from the snow and it is eaten as 'tempura'. The petiole of 'fuki' is also boiled with soy sauce.



7. *Oenanthe javanica*



8. *Zingiber mioga*

'Seri', water dropwort (7), also grows in spring and is usually used as a filling of 'miso' soup.

'Miyoga' (8) belongs to the ginger family but not so spicy. Young spike of 'miyoga' is also used as a filling of 'miso' soup.

Compared to the indigenous vegetables, only a few fruits have their origin in Japan. Among them, 'Akebi' (9) is a typical fruit which is originated in Japan.



9. *Akebia quinta*

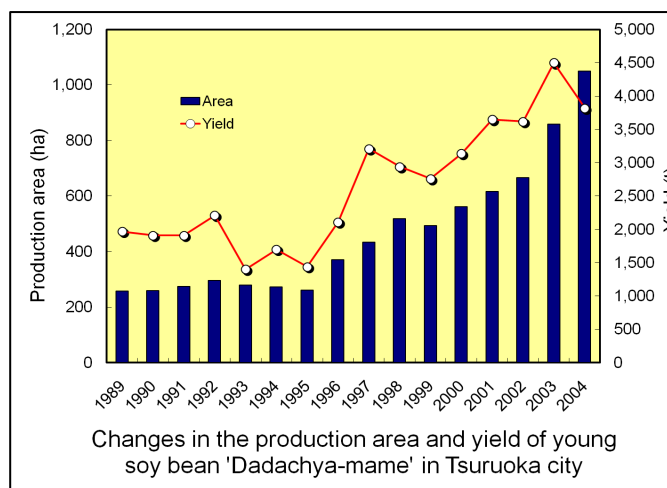


10. Ginnan:
Ginkgo
biloba

'Ginkgo' (10) nut was probably introduced from China in prehistoric era but now it is a very important material for traditional Japanese cuisines.

The other indigenous crops are 'urui' (*Hosta sieboldiana*), 'kogomi' (*Matteuccia struthiopteris*), 'shidoke' (*Parasenecio delphiniifolius*) and so on.

Both production and consumption of these indigenous fruits and vegetables are now continuously decreasing. As the result, it is becoming difficult to reserve these crops and inherit them to the next generations, but they may have a great possibility as "new" crops. For example, the area of paddy field in my place, Tsuruoka-city, decreased 30% from 39'000 ha in 1969 to only 28'000 ha in 2007. Therefore, farmers had to find out alternative crops to grow in the fallow fields but the market price of



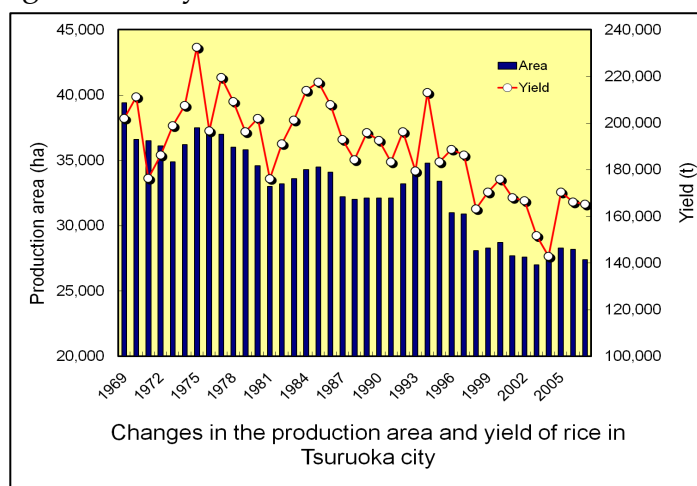
common vegetables and fruits were not competitive-price products. The agricultural cooperative focused on 'Dadacha-mame', an indigenous soy-bean. Although 'Dadacha-mame' had been grown by the farmers in this area for many years, the production had almost ceased in 1970's because of the introduction of common soy-bean. In 1980's, the agriculture cooperative in Tsuruoka city organized a production group of

'Dadacha-mame' for the expansion of the production. As the result, the production area increased almost five times during these ten years.

Now, Tsuruoka city has a patent of the seed and allow the production only inside of the city.

The other important activity is to upraise farmer's market. Many farmers' markets have been constructed under the financial support of the government and/or agricultural cooperatives. Farmers pay registration fees and arrange their products in the market.

Farmers often show the records of chemicals and fertilizers they used for the production. They often also display their photos with their farms. Because of such information, consumers feel safe when they buy the crops. Each product has been bar-coded and the amount of sales has been recorded.



This is a good retailing system because farmers can directly sale their products to the consumers. Farmer's market is also appropriate for the sale of local fruits and vegetables because the production of those crops is small and not suitable for mass production and mass consumption.

Although the local vegetables and fruits have been re-evaluated little by little in Japan, we have to promote more the production. Faculty of Agriculture, Yamagata University organized the "Collegiums of Yamagata Local Crops" in 2003 and started to publish a journal and newsletter for the introduction of local crops. Members of this group are not only researchers but also consumers who are interested in the movement of slow food, local production for local consumption, protection of gene resources and so on. Therefore, the journal contains essays, recipes of local crops, grower's opinions concerning about local crops. In 2007, we published a book about local crops in Yamagata. We also organize food contest and symposium about the local crops every year. But, more important activity is to notice the importance of local vegetables and fruits for the young people and because of this objective we often have a seminar for high-school students. We hope that the young students who took this seminar will enter our university, research about local crops, and eventually work for the extension of local crops after the graduation. This is our goal.

Q&A

M CHAUVET : J'avoue que je suis épaté par la maîtrise du modernisme des japonais puisque Monsieur Nishizawa avait un chronomètre devant lui, rendant totalement inutile le rôle du président puisqu'il a respecté à la minute près son temps de parole.

PUBLIC : Oui, je trouve que les japonais ont une longueur d'avance sur nous dans ce sens que l'Etat ou les cités, les villes mettent à la disposition des agriculteurs des locaux pour que ces agriculteurs fassent eux-mêmes la distribution. Tout à l'heure on a évoqué le rôle de la grande distribution comme vecteur de la consommation des fruits et légumes, franchement, je crois que ça serait bien mieux si on associait les agriculteurs, autrement dit si les activités locales faisaient le nécessaire pour que les agriculteurs puissent vendre eux-mêmes leurs produits. Ce modèle là, je pense qu'il faudrait le généraliser au maximum et je suis très étonné qu'on n'en parle pas davantage partout. Merci en tout cas aux Japonais de nous donner un si bon exemple. En plus de ça, eux-mêmes forment des jeunes donc la sensibilisation des cultures locales pour être les futures acteurs, là aussi « chapeau » parce que je ne pense pas qu'il existe ce type de modernisme de vision chez nous. Nous avons vraiment des longueurs de retard dans ce domaine.

PUBLIC (Philippe BORIN, Producteur d'endives et vice-président d'INTERFEL) : J'ai été au Japon, je ne pense pas que le système japonais soit applicable au français, mais pourquoi pas. La grande distribution n'a pas sa place au Japon par rapport au

système européen. Ils ont gardé un système tout à fait différent mais extraordinaire mais pour un occidental difficile à comprendre.

PUBLIC (Bernard CHEVASSUS-AU-LOUIS): Monsieur Nishizawa, j'ai été impressionné par votre vitesse d'augmentation de consommation de viande, j'ai cru voir que vous étiez passé de 30 à plus de 100 kilos de consommation de viande de 1960 à 2000. (...) Le poisson était une autre courbe et j'ai été vraiment impressionné. La consommation de viande (voir graph2) a atteint 130 kilos par an et par habitant. Même si ce sont tous les types de viandes c'est un chiffre énorme. (...)

T NISHIZAWA: Yes, this is in kilograms, per person, per year. There are the good numbers.

PUBLIC (Mario WINOGRAD): En Argentine on croyait qu'on mangeait la plus grande quantité de viande de vache du monde qui est de 70 kilos, seulement de vache mais avec le poulet et le cochon, on n'arrive pas à ça, on arrive à quelques 100 kilos et nous ne mangeons presque pas de chèvre ou mouton. Et c'est un problème pour nous car nous mangeons beaucoup de viande et trop peu de fruits et légumes.

PUBLIC (William GUILLARD from the United States, Wholesaler): I was dully impressed with what I saw in term of the variety of the produce as well as the variety in cultural methods and I was just wondering if you could explain or expend a little bit on the breeding activities that are undertaken in Japan and bring new varieties, in particular maybe in Biwa, loquats or maybe even melons or something like that.

T NISHIZAWA: Breeding in Japan is mainly performed by private companies or for national experimental stations, but universities have a small role for the breeding.

PUBLIC (Bernard BRUYERE, Président délégué de la Fédération du Commerce et de la Distribution à INTERFEL): Comme toujours on a un peu taquiné la grande distribution, je voudrais quand même remettre un petit peu les pendules à l'heure. Monsieur disait qu'il fallait prévoir des marchés où les producteurs viennent vendre leurs produits etc. Je crois que le système français n'est pas tellement adapté à ce mode de consommation, il existe, et notamment en Province, des marchés paysans mais le consommateur et la consommatrice plus particulièrement ne veut pas consacrer autant de temps qu'il y a une cinquantaine d'année pour faire ces courses. Aujourd'hui dans les hypermarchés, le consommateur passe à peu près 40 min pour faire ses courses, il y a encore 10 ans il mettait 1h30, c'était un plaisir, aujourd'hui il veut de la rapidité d'achat. En ce qui concerne l'allusion de monsieur Chauvet pour la présentation des fruits et légumes dans les hypermarchés, il est vrai que certains de nos rayons fruits et légumes en hypermarchés se sont banalisés au fil du temps. Néanmoins, n'oublions pas une chose, c'est qu'à la création des hypermarchés le but est de tout trouver sous un même toit donc par rapport au marché paysan où nous

n'avions qu'une certaine catégorie de produit, là nous avons tout un assortiment de produits et aujourd'hui des produits de contresaison qui viennent en hiver d'Amérique du Sud ou d'Afrique du sud, d'extrême orient. Je terminerais pour vous dire que des efforts considérables sont fait aujourd'hui pour mettre en valeur les fruits et légumes dans certaines chaines de magasin que je représente ici et il est créé des espaces fraîcheurs spécialistes en hypermarché où l'on trouve 300 à 400 références de fruits et légumes frais hors bio et 4^{ème} gamme et fruit secs. Les magasins qui ont osés franchir ce pas voient leur volume se développer et leur CA se développer de plus de 10 à 20% selon les cas et la première année notamment. Sachez que des efforts considérables sont quand même fait, je rappelle que nous pesons 75% de la vente des fruits et légumes en France, il faut en laisser un petit peu à nos chers détaillants représenté par Gilles Millon mais des efforts considérables sont fait et notamment par la professionnalisation de nos cadres et employés.

M CHAUVET : (...) Parmi les leaders de l'interprofession qui montre que vous pouvez avoir pour nos approches je dirais tout d'abord par rapport à l'exposé de Monsieur Abis tout à l'heure c'est que dans les pays du sud on a en quelque sorte une économie du hale ? C'est-à-dire que d'un côté il y a des systèmes traditionnels très primitifs etc. où les produits sont à même le sol et d'un autre côté on passe dans des hypermarchés parfois dans des enclaves, peut-être pas pour l'Algérie mais j'étais l'année dernière au Kenya où j'ai visité un centre commercial dont l'entrée est contrôlée c'est même pratiquement réservé aux européens d'ailleurs ou les kenyans riches où on passe d'un extrême à l'autre et on a pas tout les stades intermédiaires que heureusement on a quand même pu maintenir en France et j'espère qu'on va continuer c'est-à-dire que à coté de la grande distribution on a aussi des détaillants spécialisés et on a aussi les marchés forains. Je fais toutes mes courses donc je suis sensible à cette notion de perte de temps, j'ai évidemment moi aussi pas envie d'aller à plusieurs endroits, personnellement je ne vais jamais sur les marché paysans parce que si c'est pour acheter 3, 4 produits et devoir de toute façon aller ensuite au supermarché, ça ne vaut pas tellement le coup en termes de temps consacré. Par contre je vais dans des marchés forains presque tout le temps, je fais la différence entre marché forain et marché paysan.

PUBLIC : Ecoutez il n'y a aucune raison de dévaloriser les marchés paysans enfin !

M CHAUVET : Mais je vous explique mon comportement ! (...) Cela dit, en ce qui concerne la grande distribution, en tant qu'observateur, ce que je constate et ce que déplore c'est que je pense que souvent il y a un problème de formation et de turnover du personnel. C'est-à-dire que j'ai l'impression que, je ne vais pas faire de statistique mais peut-être que la moitié disons des chefs de rayons fruits et légumes ne sont pas vraiment compétents et en plus une des raisons serait peut-être parce qu'ils ne sont pas forcément payés comme les gens compétents pourraient l'être. Excusez moi j'ai l'impression de vous attaquer mais comme je sais que vous êtes un

représentant de la grande distribution et bien que la grande distribution est capable également du meilleur. Je vais citer Carrefour (...) parce que je suis la gamme Reflets de France et je suis épaté de la réactivité qu'ils ont, j'ai entendu parler quelqu'un de chez Carrefour et j'ai trouvé qu'il avait une hauteur de vue vraiment remarquable. La grande distribution a les moyens de recruter des gens de valeur, de former les gens etc. à eux de le faire et après tout que la concurrence face le résultat mais c'est vrai que par rapport à des petits détaillants, parce qu'on a eu un peu une tendance à, je ne dirais pas un paupérisation mais chez beaucoup de petits détaillants il faut dire qu'on voit de moins en moins de français ce sont souvent par exemple des maghrébins qui connaissent un peu les fruits et légumes mais qui n'ont pas forcément toutes les compétences nécessaires pour faire ce que nous on souhaiterait aujourd'hui les voir faire. Donc, il y a un problème qui se pose à tous les circuits de distribution et qui mérite certainement une approche globale de la part de l'interprofession mais ce n'est pas à moi de faire votre politique, je constate le résultat en tant que consommateur. Je souhaite qu'on continue à avoir des options. Il y a des produits que je ne retrouve que chez les marchés paysans, nous sommes bien d'accord, donc quand je cherche un produit je sais où il fait aller. Que le meilleur gagne, mais en tout cas on ne pourra promouvoir les fruits et légumes que si globalement, quelques soient les acteurs de la filière, on augmente le niveau de savoir-faire, de compétences des gens qui ont à les manier. Effectivement, on ne peut pas traiter les fruits et légumes comme on traite des conserves ou des produits industriels stabilisés etc. ça c'est certain.

PUBLIC (Bernard BRUYERE): Je partage à 100% votre point de vue mais et j'agis en ce sens à la Fédération du Commerce, c'est-à-dire qu'on a besoin de véritables professionnels pour faire avancer les choses et développer nos ventes et de même développer la consommation de fruits et légumes. L'année dernière je l'avais exposé à l'EGEA de Bruxelles, on a besoin de former des gens, certes nous avons malgré tout de bons professionnels mais nous avons encore des actions de formations à faire. Je voudrais qu'un jour les fruits et légumes soient considérés comme un métier de bouche à part entière comme la boucherie, la charcuterie, le traiteur, la boulangerie etc.

PUBLIC (Mariano WINOGRAD): Même si je vois que ça ce casse un peu la figure, sincèrement, pour nous, c'est très intéressant. Comme Monsieur le Producteur d'endive a dit, la solution japonaise serait sûrement, peut-être pour l'Argentine, difficile de copier mais même la solution française serait difficile de copier mais nous servira sûrement pour apprendre. Nous avons reçu la coopération du CFTL en Argentine, nous ne sommes pas vraiment capables de vous copier, mais nous pouvons bien sûr vous comprendre. Comme après la guerre, la France a trouvé une solution pour sortir de la pauvreté, de la guerre, et aujourd'hui vous êtes un pays puissant. Aujourd'hui je suis venu pour apprendre sur la promotion de fruits et légumes et je suis sûr que vous trouverez, même dans votre discussion politique et

sectorielle quelques solutions qui nous serviront. Pour moi, ce n'est pas seulement un plaisir mais un honneur d'être ici en vous écoutant et nous avons beaucoup besoin de ce que vous trouverez dans votre discussion en matière de ce qui nous concerne tous. Au moins en Argentine, on doit doubler la consommation de fruits et légumes et on doit réduire la consommation de viande et ça c'est un très grand défi.

PUBLIC : Pour répondre à Monsieur, pour réussir, il faut la diversité dans les fruits et légumes, première chose. Dans tout système il faut garder la diversité et les Japonais l'on compris, ils sont très progressistes et très traditionnalistes. Je voudrais savoir, il ya dix ans que j'ai été au Japon, combien aujourd'hui la grande distribution représente au Japon ? Les grandes surfaces de plus de 6500 m²?

T NISHIZAWA: I can not say the exact number but we also have many hypermarkets. On the other hand, we also have many local farmers' markets nowadays, for instance, the population of Tsuruoka city is just 100'000 but there are more than 20 such farmer's markets. Farmer's markets do not compete with hypermarkets because the cell mainly local products or unusual crops. In the hypermarkets, we can only buy common varieties.

SESSION 13

PESTICIDES MANAGEMENT : F&V CONSUMPTION

Chair: **M. Dunier-Thomann**

- Evaluation of consumer exposure to pesticides. **B. Declercq**
- Evaluation of consumer exposure to pesticides: a French study. **A. Périquet**
- The EU Coordinated Monitoring Programme and Rapid Alert System for Pesticide Residues. **L. Martin-Plaza**
- Risk management in France. **F. Gérault**

Evaluation of consumer exposure to pesticides

Bernard DECLERCQ

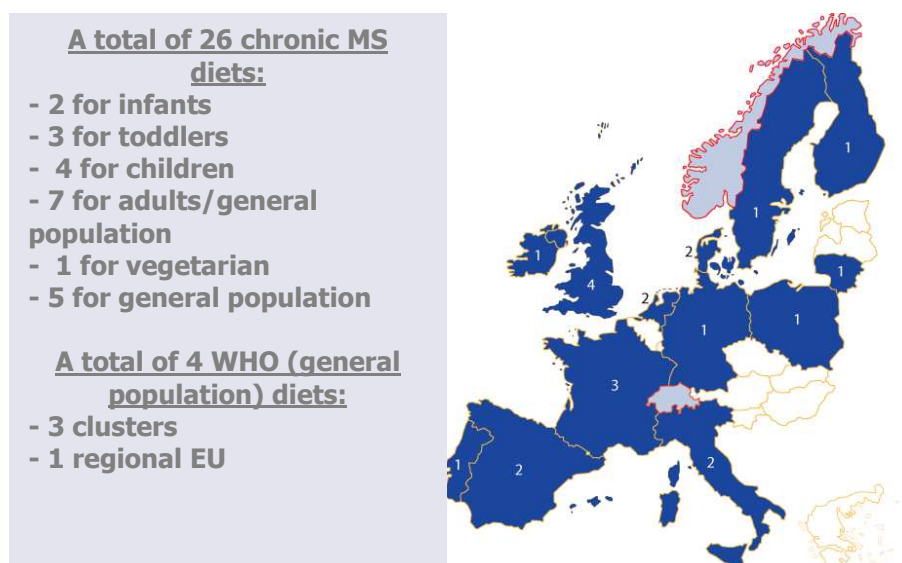
DGCCR, Massy, France

Nous vivons dans un monde qui m'étonne un peu. Au 21^{ème} siècle, on a encore des révoltes par manque de nourriture car des gens ont faim et cela est absolument inadmissible. Il y a des actions à entreprendre car à priori les productions agricoles ne sont plus seulement destinées à l'alimentation humaine. Auparavant, on produisait les végétaux uniquement pour alimenter les humains et les animaux. Maintenant, on a d'autres débouchés. On a un problème car on ne produit plus assez de végétaux pour l'alimentation du monde parce la population augmente de façon inexorable et d'autre part les surfaces cultivables ne sont pas extensibles. Il y a donc une question peut-être d'ordre politique, où on aura absolument besoin d'accroître la production pour faire face aux besoins. Comment peut-on accroître la production des produits végétaux ? On peut le faire de différentes façons mais l'objectif en augmentant cette production est de protéger l'environnement naturellement mais de protéger aussi les consommateurs et de protéger les applicateurs. Pour le domaine des pesticides, notre problème est d'étudier et de voir si l'utilisation des pesticides est acceptable du côté des exigences de l'environnement en général et de la protection de l'eau en particulier à savoir si le pesticide va passer dans l'eau ou pas et à ce propos il faut dire que du point de vue international nous avons une situation assez laxiste. Au niveau européen on a une situation de droit. La quantité de pesticide dans l'eau est limitée à 0,1µg/L ce qui est quand même assez bas et qui n'est fondé sur aucune analyse scientifique. Il faut prendre en compte la santé du consommateur et protéger également les opérateurs. Je n'aborderais pas tous les points pour autoriser les pesticides sur le marché, étant donné que cette réunion est basée sur les F&L j'ai axé cet exposé simplement sur la protection des consommateurs bien que pour tous les autres aspects, sauf pour l'eau, nous avons un concept très similaire c'est-à-dire qu'il faut regarder si le 'crédit toxicologique' est bien respecté vis-à-vis de la consommation des humains, des animaux et de la faune aquatique et terrestre .

Pour les consommateurs, on a deux grands axes pour étudier l'exposition. On a l'aspect chronique c'est-à-dire que tout au long de la vie le consommateur est-il protégé en absorbant des F&L ou des produits végétaux qui sont contaminés par des pesticides. L'autre modèle qui est un modèle d'exposition aiguë va regarder dans quelle mesure en absorbant seulement une portion d'un produit alimentaire les effets sont-ils acceptables. Pour le chronique comme pour l'aiguë, on a besoin d'avoir des informations toxicologiques et ces informations sont essentiellement basées sur des études à moyen terme et à long terme en général conduites sur des animaux de laboratoire. Dans ces études à moyen terme et à long terme on peut citer des études de cancérogénèse, de génotoxicité et également de tératogénèse et de reprotoxicité. On a également besoin des essais sur la neurotoxicité des produits. Ce qu'il faut

comprendre sans rentrer dans le détail de ces études, elles sont très coûteuses et aussi très complètes ainsi que pour les médicaments. On évalue donc à partir de ces études une dose sans effet, c'est-à-dire quelle est la plus petite dose du pesticide que l'on a donné aux animaux qui n'entraîne aucun effet adverse. Pour déterminer ce qu'est une dose journalière acceptable (DJA) on applique un facteur de sécurité (FS) à la dose sans effet (DSE) la plus faible et ce facteur de sécurité peut varier de 100 à 500 : $ADI = DSE/FS$. Le facteur de sécurité le plus faible est de 100 parce qu'on a un facteur de 10 qui tient compte de l'extrapolation de l'animal à l'homme et dans la population elle-même on a des cas extrêmement différents qui peuvent aller de l'adolescent à une personne malade par exemple comme un facteur supplémentaire de 10. Ce qu'il faut bien comprendre c'est qu'à ce niveau là on a déjà un facteur de sécurité très important puisqu'il est de 100 sur la dose sans effet la plus faible. Il est aussi important de voir quels sont les régimes alimentaires puisque l'on doit évaluer cette valeur toxicologique à la quantité de pesticides ingérés. Donc il est nécessaire de connaître la consommation (les régimes alimentaires) et la contamination des aliments (le niveau des résidus).

En ce qui concerne le niveau de régime alimentaire on peut voir que même en Europe, il y a de nombreux régimes alimentaires ne serait-ce que pour évaluer les chroniques. Au niveau international, on a 13 régimes alimentaires sur lesquels on teste si la consommation de pesticides est bien inférieure aux données toxicologiques.



Pour ce qui est des LMR on a deux problèmes. Le premier problème est de définir ce qu'on va prendre pour résidu. On fait donc ce qu'on appelle des études de métabolisme et de ces études, on en déduit la nature du pesticide avant d'évaluer la quantité. La nature du pesticide peut être le pesticide lui-même mais peut être aussi les pesticides et ces métabolites et cela peut aussi être tous les métabolites suivant les possibilités analytiques de les détecter. Dans tous les cas, ce que l'on doit faire c'est prendre en valeur le maximum de contamination que l'on a pour protéger le consommateur. Il est absolument essentiel que l'on connaisse cette nature du

pesticide et évaluer ensuite la quantité. Elle est évaluée avec des essais que fournissent les professionnels en respectant quelque chose dont on ne parle pas souvent au niveau international et parfois au niveau communautaire les bonnes pratiques agricoles (BPA). Les bonnes pratiques agricoles se définissent avec les quantités appliquées, le nombre d'applications et aussi le délai avant récolte C'est donc quelque chose de très important et qui est déterminé par des études d'efficacité. Nous avons donc la quantité d'aliments consommés. Pour chaque culture nous avons des quantités de résidus de pesticide. On peut donc évaluer les quantités de pesticide qui sont soit le pesticide lui-même ou ces métabolites etc. et on va le comparer à ce qu'on appelle le crédit toxicologique. L'exposition est calculée (exposition maximum théorique, TMDI) de façon affinée en essayant d'estimer la quantité de produits contaminés que l'on va ingérer. On va l'estimer et comparer également au crédit toxicologique : $TMDI = \text{somme de} [\text{consommation} \times LMRs]$.

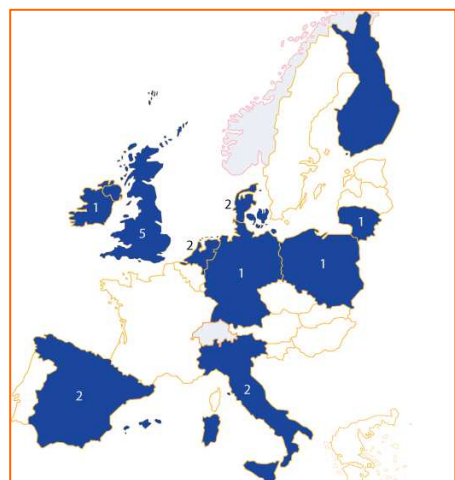
Le crédit : $CREDIT = ADI \times \text{poids de l'humain}$. Il faut non seulement protéger l'adulte, mais il faut aussi protéger les adolescents, les bébés et le poids de l'humain est naturellement très important. Ce qui est reconnu de façon internationale c'est assez souvent l'adolescent qui est le plus critique pratiquement pour tous les pesticides parce que par rapport à son poids l'adolescent absorbe une quantité d'aliment très importante. (...) Il faut toujours que le crédit soit supérieur à la consommation du pesticide. Ce qu'il faut retenir aussi, ce qui est essentiel c'est que quand on fait une estimation de l'exposition chronique, c'est toujours l'ensemble des végétaux qui ont été traité qui doivent être estimé avec la différence pour l'exposition aiguë où là, c'est chaque culture qui est visée parce que quand vous mangez une pomme qui contient des pesticides et qui ont des effets aigus c'est à ce moment là que la portion de pomme donc la culture elle-même qui est visée. La dose de référence aiguë, ce qu'on appelle ARfD est basée sur des études toxiques qui sont des études courtes puisque cela a un effet aigu. En général, ce sont des études neurotoxiques et des études de reproduction. Par exemple il y a des produits qui sont des pyrethrinoides qui ont des effets neurotoxiques et qui disposent dans ces cas d'une dose de référence aiguë. Il y a aussi d'autres produits qui ont des effets sur la reproduction qui eux aussi ont des doses de références aiguës. Pour la quantité toxique que l'individu peut absorber, il y a, comme pour le chronique, la dose

sans effet et il y a un facteur de sécurité qui est généralement de 100. Donc, toujours la même chose, un facteur de 10 pour l'extrapolation

animale et de l'humain et 10 pour l'inter-population. Cela est valable du point de vue international, en Europe de temps en temps quand on manque de données on prend comme dose de référence aiguë la DJA parce que c'est vraiment un effet chronique

A total of 18 acute diets were provided:

- 8 for children



donc pas du tout un effet aigu. Je pense que prendre une DJA pour fixer une dose de référence aiguë, c'est quand même critiquable. Pour les doses de références aiguës il y a des portions alimentaires comme pour le chronique mais il y en a beaucoup moins de modèles (comme on peut le voir sur la carte).

Les spécialistes des régimes alimentaires pour les effets aigus ont été établis en général par le Royaume Uni qui dispose de plusieurs modèles un peu copiés par tous les autres pays européens et j'ai appris dernièrement que l'agence de sécurité alimentaire européenne va bientôt nous mettre sur son site d'un seul régime alimentaire chronique et probablement aussi un seul régime alimentaire aigu. Ce qu'on doit bien comprendre c'est que l'aigu c'est une portion

Case	IESTI	U = Unit weight (in kg) γ = Variability factor LP = Large portion consumption data for the commodity (97.5th percentile of eaters) (in kg) hr = Hr (in mg/kg) bw = Body weight (in kg)
1 and 3	$= LP \times Hr / bw$	
2a	$= U \times Hr \times V + (LP - U) \times Hr / bw$	
2b	$= LP \times Hr \times V / bw$	

Ce qui est dit Hr c'est la valeur maximum de résidu. Je suis un peu contre cette valeur Hr qui est prise, c'est la valeur maximum critiquable parce qu'elle n'est pas légale. Il n'y a que des spécialistes, peut être une cinquantaine à connaître cette valeur Hr. On milite actuellement pour que cette valeur ne soit pas la valeur la plus haute de résidu dans les essais mais qu'elle soit la LMR (la quantité maximum de résidus de pesticides autorisée sur une culture) car elle n'est pas publiée et donc seulement connue par les experts mais pas toujours par les laboratoires surveillant la contamination des produits végétaux. Le facteur de variabilité (V) est au moins de 3 mais varie encore suivant les pays.

Pour l'effet aigu si nous avons un dépassement de la consommation de la dose de référence aiguë (IESTI > ARfD) alors nous avons plusieurs possibilités qui passe toujours par une modification de la pratique agricole. Nous allongeons le délai entre le dernier traitement et la récolte et où nous demandons de nouveaux essais avec des réductions du nombre d'applications car nous traitons dans ce cas culture par culture. Au niveau international comme au niveau communautaire, on n'a pas utilisé jusque maintenant une approche probabiliste parce que cette approche fait appel à des modèles extrêmement lourds à gérer, coûteux, qui permettraient probablement d'autoriser des pesticides que l'on interdit actuellement. Les consommateurs ont encore là une sécurité complémentaire. Les experts savent très bien que ce que l'on juge actuellement est vraiment avec un esprit très rigoureux, peut-être trop même. Une autre chose qui se met plus ou moins en route actuellement est de regarder qu'elle est l'exposition du consommateur vis-à-vis d'un ensemble de pesticides qui auraient les mêmes mécanismes d'action sur le déclenchement des effets. Cela a été fait pour des pesticides qui sont bien connus mais cela mériterait aussi de s'appliquer également à des produits qui sont peut-être un peu moins connus tels que des

produits de la famille des strobilurines, les triazoles etc. qui ne sont pas des produits étudiés actuellement dans ces systèmes là.

Ce qu'on doit retenir de cet exposé c'est que le 'crédit toxicologique' pour tous les produits pesticides qui sont sur le marché, est évalué et est toujours supérieur à la consommation, que ce soit l'aigu ou le chronique. Les LMR que l'on fixe ne sont pas des valeurs sanitaires, ce sont des valeurs obtenues à la suite de mise en œuvre de bonnes pratiques agricoles. Pourquoi le fait-on ? Pour éviter que l'on disperse dans l'environnement des pesticides sans nécessité absolue pour l'agriculture. Il ya aussi d'autres problèmes que l'on doit regarder, il faut essayer d'utiliser juste la quantité et le nombre d'applications nécessaires pour éviter les résistances parce que pour le gestionnaire plus tard, cela va poser des problèmes, et surtout éviter de traiter les végétaux au moment où on les récolte, éviter aussi d'appliquer des pesticides avec des délais de 0 jour. Donc, on doit essayer au niveau international de le faire. Cette évaluation du risque est faite pour aider le gestionnaire du risque à voir s'il doit ou non conserver ce pesticide dans les applications futures et on lui donne déjà des éléments par l'évaluation du risque. Nous avons déjà aidé les gestionnaires car nous avons déjà écarté de l'emploi un certain nombre de pesticides. Enfin, il faut que les évaluations de la toxicité prennent en considération toutes les utilisations du pesticide, et notamment l'environnement. Il s'agit d'une science assez récente qui base ces évaluations à partir de modèles.

S'il y a un message que je peux faire passer ici, il faut être rigoureux mais quand même il faut être pragmatique et raisonnable. Il faut aussi être raisonnable dans l'application des produits et que les pesticides doivent être absolument sans problème pour tous les aspects santé (consommateurs, applicateurs) pour l'environnement (eau, faune aquatique et terrestre) quand ils sont appliqués.

Q&A

PUBLIC (Robert HABIB) : Dans le calcul des risques, est-ce qu'on tient compte de la dose présente autorisée de pesticides sur les F&L par exemple ou du dépassement éventuel de cette dose que l'on peut parfois observer ? D'autre part il me semble que vous avez surtout présenté une démarche pesticide par pesticide du point de vue de l'évaluation des risques. S'il y a des combinaisons de pesticides, est-ce qu'il peut y avoir des effets non attendus du fait de cette combinaison ?

B DECLERCQ : Pour la deuxième question, j'ai déjà répondu en disant que quand c'était possible, quand on avait les mêmes effets toxiques, on essayait de combiner. Cela s'est fait pour les organophosphorés. Par exemple, pour le carbamate, pour toutes ces familles là on a fait une combinaison des effets de toutes les applications et on regarde qu'elle est l'implication sur la sécurité du consommateur donc on tient compte des effets combinés des produits. En ce qui concerne la première question, il

y a des dépassements. Des dépassements de niveaux sont des dépassements de LMR, j'ai bien indiqué dans l'exposé que la LMR c'est une limite agricole, pas une limite sanitaire c'est-à-dire que quand vous avez des dépassements des LMR contrairement à ce qu'on voit dans la presse, cela ne présente pas de risques pour le consommateur. Il faut calculer le risque après ces dépassements. Mais quand vous avez un dépassement de LMR cela veut dire que l'agriculteur n'a pas respecté l'application du produit et cela est condamnable. Ce qui est condamnable c'est le dépassement mais la santé du consommateur fait appel à un autre calcul.

PUBLIC (JF PROUST) : A propos de LMR qui ne sont pas des limites sanitaires, un des problèmes qui peut se poser c'est d'un point de vue légal par rapport au pack hygiène puisque très souvent les distributeurs ou les importateurs ou les gens dans la filière estiment que la LMR est une limite sanitaire et agissent comme si c'était une limite sanitaire et demandent le rappel du produit pour un dépassement de LMR ce qui est peut être une sur-réaction. Le problème est de savoir que faudrait-il avoir comme limite pour être dans le cadre de ce pack hygiène c'est-à-dire à partir de quelle limite de résidus doit on considérer qu'il peut y avoir un risque pour le consommateur et donc qu'il faut rappeler le produit ?

Le deuxième point est à propos des délais avant récoltes. Vous avez dit qu'il faut éviter d'avoir un délai avant récoltes de 0. Je ne sais pas qu'elle est ce délai dans tous les pays européens, en France, il y a un délai avant récolte par 'défaut' à 3 jours. C'est très bien, dans la plupart des cas cela ne pose pas trop de problème mais il y a certains cas où cela pose des problèmes. Effectivement on peut envisager sans trop de problèmes agronomiques, un délai avant récolte minimum de par exemple 24h dans tous les cas ou 12h, je pense qu'effectivement ça ne pose pas de problèmes agronomiques par contre je dois signaler quand même que le délai avant récolte de 3 jours n'est pas applicable pour certaines récoltes. Si vous êtes producteurs de courgettes ou de concombres ou de fraises, vous savez très bien qu'il faut récolter au minimum toutes les 24H.

B DECLERCO : Je ne suis pas tout à fait d'accord avec vous. Je crois que le délai de 0 jours est applicable par exemple quand on n'a pas d'autre façon de le faire et en France cela ne présente pas de façon très urgente. J'ai en mémoire en ce qui concerne la production dans les Antilles, de bananes où c'est difficile dans le champ de bananiers pour traiter des maladies de la feuille donc là je peux accepter qu'on ait des délais très courts car de toute manière les fruits ne sont pas atteints. Par contre, pour les courgettes et les fraises, je ne suis pas favorable si il y avait une telle nécessité alors il faudrait plutôt mettre en œuvre des traitements après récolte. Vous allez pulvériser dans la nature des produits qui vont contaminer les sols de façon encore plus importante et je crois qu'il faut faire très attention à utiliser les pesticides de la meilleure façon possible. Si vraiment il y a des produits que l'on ne peut pas conserver de façon satisfaisante, il faut alors utiliser les traitements après récolte et là je serais un petit peu plus tolérant mais à condition que le traitement après récolte

soit fait de façon satisfaisante, ce qui n'est pas toujours le cas en France, il faut le reconnaître. La deuxième question ?

PUBLIC (JF PROUST) : A propos du pack hygiène, quels limites doit on prendre en compte pour rappeler le produits parce qu'il y a un risque pour le consommateur puisque à priori la LMR n'est pas cette limite là et ça peut quelque fois être embêtant. Donc quelle limite doit-on prendre ?

B DECLERCQ : La LMR c'est la LMR. A partir du moment où il y a un dépassement c'est que quelque chose n'a pas fonctionné normalement, donc, il faut sanctionner. Théoriquement, le service des fraudes devrait détruire le lot, c'est clair, net et précis, il n'y a pas de retour, on doit détruire le lot car ce n'est pas conforme à la loi. Si le service de répression de fraudes fait son travail et en général il le fait bien puisque j'y ai exercé pendant un certain nombre d'années et je peux vous dire qu'on en a détruit quelque fois. Cela pose des problèmes parce qu'on n'a effectivement pas l'aspect sanitaire en main mais on a l'aspect réglementaire. On a eu des lots de raisin qui venait de l'Inde et qui avait je ne sais plus combien de pesticides dedans qui dépassait les LMR en plus, il faut arrêter là et je ne vise pas l'Inde particulièrement mais quel que soit le pays y compris la France, il faut que les producteurs sachent utiliser les produits de façon satisfaisante. C'est tout ce que je demande. Quand on autorise un produit on passe assez de temps pour regarder s'il y a des risques etc. pour qu'enfin, l'agriculteur soit bien conseillé. Il y a là aussi peut-être une incapacité de conseil auprès des agriculteurs, je le constate et j'en suis navré.

M DUNIER-THOMAN : Juste pour rebondir, comme vous le savez l'EFSA (Food Safety Authority) produit des opinions scientifiques sur ces sujets là. On a parlé de l'effet cumulatif des pesticides, pour votre information, l'EFSA vient juste de publier sur le site web sous « panel protection product and residu » une opinion très importante qui est attendue par le comité européen sur l'effet cumulatif des pesticides sur la santé humaine. C'est donc un premier volet et également un travail sur un cas particulier qui est la famille des triazoles donc reprendre l'effet cumulé des pesticides pour la famille des triazoles en particulier, c'est une opération qui en préparation et qui sera également mise sur le site. Monsieur Declercq a parlé des oiseaux, vers de terre et autres, pour votre information, la réglementation est très précise à ce sujet là, les normes en neurotoxicologie pour vers de terre, oiseaux, poissons, mammifères etc. il y a évidemment des règles très précises à suivre au niveau européen pour avoir une autorisation de mise sur le marché et les pays membres qui produisent ces dossiers ainsi que l'industrie suivent des documents guides. Il y a avait un document guide 2002 sur 'oiseaux et mammifères' qui a été mis à jour par l'EFSA, nous travaillons dessus depuis 2 ans avec des experts européens et en principe l'opinion va être adopté et sera sur le site web cet été. C'est un document de 180 pages avec 30 annexes, quelque chose de très lourd, il y a une consultation qui s'est fini en Janvier et vous pouvez donc déjà y avoir accès. Il y a

donc un document qui va être disponible très bientôt et il y a eu un énorme travail de fait au niveau européen pour mettre à jour ce document guide donc on ne travaille pas dans le vague on a vraiment quelque chose de très précis pour les acteurs c'est-à-dire les états membres et l'industrie.

Evaluation of consumer exposure to pesticides : a French study

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Cette étude a été menée à l'initiative du comité Sécurité Alimentaire d'INTERFEL / APRIFEL dont je remercie Saida Barnat qui est la coorganisatrice de ce sommet. Je voulais également remercier le Conseil d'Administration d'INTERFEL / APRIFEL qui a permis de réaliser cette étude et aussi tout le personnel qui a participé en particulier, Alexandra Deniau pour son travail tout à fait remarquable de compilation et d'analyse de résultats.

Cette étude a tenté de répondre à deux préoccupations : alors que les Autorités de Santé et les Pouvoirs Publics recommandent une augmentation de la consommation quotidienne de F&L, il était légitime que le Comité Sécurité Alimentaire d'INTERFEL/ APRIFEL se pose la question de savoir quel était le niveau d'exposition des consommateurs aux résidus de produits phytosanitaires dans ce contexte ; l'autre raison, est qu'il semble s'installer autour des F&L un climat de suspicion et de méfiance lié à la présence de ces résidus et le comité souhaitait apporter un éclairage sur ce point.

Méthodologie : Il s'agissait de confectionner des menus quotidiens énergétiquement équilibrés dont la ration de F&L allait en augmentant 200, 400, 600, et même 800 grammes de F&L par jour. Ces menus ont été validés par le Service Nutrition du Professeur Jean-Michel Lecerf à l'Institut Pasteur de Lille. A l'intérieur d'une même catégorie pondérale (200g par jour, par exemple) il suffisait d'ajouter la quantité de fruits et la quantité de légumes pour savoir ce que les individus avaient consommé quotidiennement tout au long de l'exercice.

Nous avons ensuite utilisé les Limites Maximales de

Résidus (LMR) pour calculer la quantité de chacune des substances actives que l'on peut ingérer quotidiennement au travers de chacun des F&L. Par une simple addition, on peut connaître la quantité de chaque substance active qu'un individu a ingérée quotidiennement pendant la durée de l'exercice au travers des vecteurs F&L. Nous avons comparé cette quantité ingérée au Crédit Toxicologique. Cette comparaison nous permettait de savoir quelle part du Crédit Toxicologique avait été utilisée et si la Dose Journalière Admissible était dépassée et si oui, de combien. Voici

BREAKFAST	LUNCH	DINNER
<ul style="list-style-type: none">• 130g Whole bread• 20g Butter• 30g Emmenthal• Coffee/milk (100g)• 10g Sugar• 100g Grapes	<ul style="list-style-type: none">• 100g Pasta• 10g oil• 80g Oven-baked dorado• +15g Onion• +15g Butter + white white• + 200g potato• 15g oil• 85g bread• 150g Dairy product• 15g Sugar• 100g Apple	<ul style="list-style-type: none">• Ratatouille :• 50g Aubergine• 50g Courgette• 50g Bell Pepper• 25g Shallots• 10g Basil• 15g oil• 50g Turkey white meat• 200g white rice• 85g bread• Flavoured yoghurt

un exemple de menu qui a été proposé dans le cadre d'une normo-consommation de 350-400 grammes de F&L par jour ; il suffisait d'additionner les quantités de raisins ou de pommes ou les quantités d'oignons, d'aubergines ou de courgettes proposées ce jour là avec celles qui figuraient dans d'autres menus, les autres jours sur les quatre semaines qu'avait duré l'exercice.

C'est une étude maximaliste de type AJMT ou Apport Journalier Maximum Théorique car nous nous sommes situés dans le contexte où les résidus étaient toujours présents au niveau de la Limite Maximale de Résidus (LMR). La Limite Maximale de Résidus et j'insiste sur ce point, n'est pas un paramètre toxicologique, c'est une donnée d'exposition et ce n'est pas parce qu'il y a un dépassement de LMR qu'il y a automatiquement un accroissement du risque toxique pour le consommateur. Il faut bien avoir cela présent à l'esprit. C'est un paramètre agronomique et un paramètre réglementaire qui représente la quantité de substance active qui ne doit pas être dépassée dans une denrée alimentaire donnée. Cette approche est vraiment maximaliste car lorsque les conditions des Bonnes Pratiques Agricoles sont respectées, il est très rare que l'on se situe au niveau de la LMR. L'expérience et les dosages ont montré qu'on se situait plutôt entre 10 et 30% des Limites Maximales de Résidus. Nous avons aussi considéré que toutes les substances les plus utilisées sur F&L étaient présentes dans chacune des denrées F&L ce qui, évidemment, n'est jamais le cas au cours d'une même campagne de traitement. Nous n'avons pas pris en compte les facteurs de réduction inhérents au processus industriel ou au procédé ménager d'usage courant comme le lavage, le brossage, le pelage, la cuisson et le blanchiment. Nous avons aussi considéré que l'intégralité des menus proposés était totalement ingérée, ce qui n'est pas forcément toujours le cas.

Toxicological et regulatory data: ADI and MRL
<ul style="list-style-type: none"> ➤ The Maximum Residue Limits were obtained from official sources: Ephy – ACTA - Ubifrance - Itepmi – DGCCRF – FAO ➤ The european and French MRLs are more often than not similar and when they are different, the lowest MRL is used. ➤ The ADIs have been gathered from accessible sources: Agritox – ACTA - FAO ➤ When the ADI values are different, the european ADI is used.

Sur cette diapositive figurent les sources auxquelles nous nous sommes référés pour obtenir les Valeurs Toxicologiques de Référence, la DJA en particulier, et aussi les sources qui nous ont permis d'avoir les Limites Maximales de Résidus.

Lorsqu'il y avait selon la source, une différence entre les LMR, nous avons retenu

la LMR la plus basse ; quand il y avait également des différences à propos des Doses Journalières Admissibles, nous avons retenu la DJA européenne.

Passons aux résultats de cette étude et à leur discussion. Sur les 186 substances actives (SA) qui ont été répertoriées, nous en avons retenues 162 car la toxine *Bt* n'est pas répertoriée, 5 SA ont eu un retrait d'homologation et pour 18 d'entre elles nous

n'avons pas pu trouver soit la DJA soit la LMR ; sur ces 162 SA, 10 étaient très souvent utilisées dans le traitement des F&L.

Active substances and ADI

Amount (g) of fruit and vegetables in the diet	Number of active substances ^a likely to exceed the ADI		Number of active substances ^a likely to exceed 10% of the ADI
200	0	0	13
400	2	0	21
600	2	0	27
800	7	5	38

^a out of a total of 162 active substances

Sur cette diapositive nous avons mis en exergue le nombre de substances actives qui étaient susceptibles de dépasser la DJA : 0, 2, 2 et 7 substances actives étaient dans ce cas, respectivement pour les régimes de 200, 400, 600 et 800 grammes de F&L par jour. Si on exclut la roténone et la vinclozoline qui ont eu un retrait d'homologation, ces chiffres sont de 0 pour les trois premières catégories de grammage et de 5 pour le régime à 800g de F&L/jour. Si on repère le nombre de substances susceptibles de dépasser de 10% la Dose Journalière Admissible, les chiffres sont : 13, 21, 27 et 38 en fonction des catégories pondérales de F&L ingérés. Nous avons retenu ce chiffre de 10% de la DJA car la plupart des études montrent, et la plupart des experts s'accordent à dire qu'il n'y a pas, à ce niveau de la DJA, un fort risque pour le consommateur.

Average percentages of the ADI

Amount (g) of fruit and vegetables in the diet	All active substances (162)
200	2.85
400	5.81
600	8.54
800	11.26

Nous avons calculé, toutes SA confondues utilisées sur tous les F&L, ce que représentait le pourcentage moyen de la DJA. Nous sommes loin du Crédit Toxicologique Acceptable puisque les pourcentages sont de 2.8, 5.8, 8.5 et la barre des 10% de la DJA n'est atteinte que lors de la plus forte consommation quotidienne de F&L. Il est donc clair que même dans ces conditions, on reste éloigné du Crédit Toxicologique Acceptable.

En guise de discussion, je voudrais faire une comparaison avec une étude qui a été effectuée au cours des années 1991-1994, sous l'égide de l'Observatoire National des Consommations Alimentaires. C'est une étude qui a été réalisée selon la même méthode maximaliste et selon le protocole AJMT. Si l'on se situe dans le cadre d'une normo-consommation de F&L, les quantités et les qualités des F&L étaient également comparables et le nombre de SA prises en compte était quasiment identique.

Comparaison avec une étude précédente (1991-1994) (Observatoire National des Consommations Alimentaires)

- ➡ **Même méthode maximaliste**
- ➡ **Comparable à la consommation de F&L (Insee 1989 - Sécodip 1991)**
- ➡ **Nombre de substance actives considérées: 162 vs. 165**

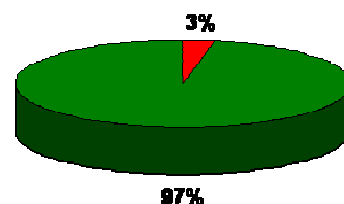
	OCA	APRIFEL
Nombre de SA Excédant la DJA	22	0
Nombre de SA entre 10 et 100% de la DJA	45	21
Nombre de SA sous les 10% de la DJA	100	144

Cette comparaison montre qu'il y a un certain nombre de progrès qui ont été effectués au cours de ces quinze dernières années puisque le nombre de SA susceptibles de dépasser la DJA est passé de 22 à 0. Le nombre de SA comprises entre 10% et la DJA est passé de 45 à 21 et enfin le nombre de SA au dessous de 10% de la DJA est passé de 100 à 144. Donc on peut estimer que dans ces conditions des progrès ont été réalisés concernant le nombre de SA utilisées et le niveau des résidus présents dans les F&L.

En guise de conclusion, je voudrais dire que dans le cadre d'une normo-consommation de F&L aucune SA sur les 162 testées ne dépasse la Dose Journalière Admissible, 144 SA sont en dessous des 10% de la DJA et les pourcentages de la DJA avoisinent les 6%, ce qui signifie que 94% du Crédit Toxicologique 'disponible' n'a pas été utilisé.

Si on prend en compte les facteurs de réduction dont nous nous étions affranchis et qui sont listés ci-contre, on voit qu'on utilise environ 2 fois moins du Crédit Toxicologique disponible (3% au lieu de 6%). Donc raisonnablement, je crois que dans ce contexte là, on peut dire que la sécurité du

2. According to an Estimated Daily Intake approach



- use on 30% of authorised cultivations
- residues at average/median level (1/3 of the MRL)
- 50% of elimination of residues during preparation before consumption
- **real exposure = 3% of the ADI**

consommateur vis-à-vis des résidus des produits phytosanitaires est largement assurée.

Si maintenant on se situe dans le contexte d'une augmentation préconisée de la consommation quotidienne de F&L, on est toujours loin du Crédit Toxicologique disponible puisque les pourcentages sont de 6 et 8% et que la barre des 10% n'est atteinte qu'avec la plus forte consommation de F&L, laquelle est très largement excédentaire et c'est dans ce seul régime à 800 grammes par jour que 5 SA sur 162 sont susceptibles de dépasser le Crédit Toxicologique.

On peut dire que l'exposition du consommateur vis-à-vis des résidus de produits phytosanitaires n'est pas augmentée de façon significative quand la quantité de F&L ingérée quotidiennement s'accroît. Cela nous permet de dire clairement que les F&L doivent être considérés comme des vecteurs de santé plutôt qu'être perçus comme des vecteurs de toxiques. Certes, cette étude est théorique, mais une étude « de terrain » plus récente réalisée par la Direction Générale de l'Alimentation entre 2000 et 2001, selon une méthodologie différente dite des « Repas Dupliqués », a abouti à des conclusions similaires. Les enquêteurs arrivaient chez les familles averties, sauf du jour de leur venue, prélevaient la totalité du repas à des fins d'analyse, au moment où elles allaient se mettre à table. Sur 161 repas qui ont été prélevés, ont été recherchées 10 SA.

DGAL (2000)

- **Méthodologie différente: «Repas Dupliqués »**
- **Echantillon d'analyse: 161**
- **Nombre de substances actives étudiées: 10**
- **Résultats**

Substances Actives	Echantillon + (%)	% DJA
Dichlorvose	0	-
Dicofol	7	1.7
Ométhoate	0	-
Oxydemetone	0	-
Parathione-ethyl	10	1
Phosalone	23	10.3
Phosphamidon	0	-
Procimidone	35	0.2
Triazophose	14	4
Vinchlozoline	27	0.6

Sur ces 10 SA, quatre n'ont jamais été détectées, cinq atteignaient un pourcentage extrêmement faible de la DJA (entre 1 et 4%) et une seule, la Phosalone, atteignait la barre des 10% de la DJA. Donc entre une étude théorique et une étude de terrain, il y a une bonne concordance des résultats. Après une telle comparaison, je crois qu'on peut dire que la sécurité du consommateur est correctement assurée.

Quelques réflexions en dehors du contexte de cette étude. Il semble circuler dans les médias et par les médias et chez les citoyens une peur des résidus de produits phytosanitaires or j'espère avoir montré que cette peur était injustifiée. Elle est peut-être entretenue par des prêcheurs de l'apocalypse pour qui il n'y a de salut que sans pesticides et sans OGM, mais je crois que cette peur est vraiment exagérée et je trouve que c'est regrettable car elle entame la confiance des consommateurs vis-à-vis du potentiel santé qu'ont les F&L. Dans une des séances plénières, Monsieur Barling (session 10) a dit qu'il faudrait dans l'avenir concilier productivité et diminution du recours aux produits phytosanitaires ; je crois que cette approche est possible à condition que toutes les parties puissent discuter entre elles, de manière raisonnée et raisonnable afin d'arriver à un consensus. Il a dit aussi que commençait à se profiler la notion de pénurie alimentaire ; dans ce contexte, les Conseils de l'Europe, de la FAO, de l'OMS, de l'ONU sont de donner aux Pays en Développement les intrants nécessaires pour augmenter la productivité et sous le terme intrants, ce ne sont pas seulement les matières fertilisantes dont il est question, ce sont aussi les produits de protection des plantes. Donc quand, dans les Pays Développés, on s'inquiète beaucoup de la qualité de l'alimentation ; dans les Pays en Développement, il s'agit de produire pour manger. Dans les médias des Pays Développés, il y a cette notion de peur alimentaire mais la notion d'émeute alimentaire se fait jour comme les crises récentes l'ont montré dans les Pays en Développement où la position des gens s'est durcie puisqu'on en vient à utiliser des armes pour s'approvisionner en denrées alimentaires. Bien sûr, je ne suis pas suffisamment naïf pour croire que la productivité est la seule raison de cette pénurie, il y a en bien d'autres mais il n'empêche que nous sommes confrontés aujourd'hui à ce problème.

Q&A

PUBLIC (Jean-Claude MORON, vice président du Comité économique F&L Bassin Val de Loire) : Ce que je viens d'entendre du professeur Périquet me rassure, c'était très clair parce que ce que j'avais cru comprendre tout à l'heure, initialement c'est que les producteurs européens en tout cas français travaillaient peut être moins bien que les producteurs américains. Je m'explique, l'an dernier dans le cadre du colloque à Bruxelles, un scientifique américain qui s'appelle Bruce Ames, auteur de plus de 500 publications nous déclarait que 99,99% des substances chimiques absorbées étaient d'origine naturelle et que seulement 0,01% étaient d'origine synthétique. Ces chiffres semblaient être approuvés par la communauté scientifique qui était présente. Donc quelque part je me dis, c'est quand même pas tout à fait ce que j'ai l'habitude d'entendre. D'autres disent que les substances chimiques d'origine naturelle sont indispensables pour stimuler les défenses naturelles. Finalement, comment peut-on prouver ces travaux ? Je pense que Monsieur Périquet a sans doute un avis sur ce sujet.

Ma deuxième question, toujours dans le rapport pesticide/cancer me fait penser au rapport qui est apparu sur les causes de cancer en France le 13 septembre 2007 je

crois et qui disais précisément qu'il n'y avait aucun lien putatif entre pesticides et cancer et cela ne reposait sur aucune donnée solide. C'est un rapport qui a quand même été cautionné par l'Académie des Sciences, l'Académie de Médecine, l'INVS donc l'Institut de Veille Sanitaire et puis le Centre International du Cancer. Alors lorsque j'entends tout ça je me dis c'est tout de même pas si dangereux et pas si dramatique que cela. Pourriez-vous m'apporter des précisions ?

A PERIQUET : Effectivement Monsieur Bruce Ames est quelqu'un de très connu dans le milieu scientifique puisqu'il est le père du test 'Ames' qui permet de voir si un produit est mutagène ou ne l'est pas, ce qui est quand même très important, c'est donc une sommité scientifique et il était intervenu l'an dernier à Bruxelles lors de la conférence EGEA. Il avait dit effectivement avec beaucoup d'humour, parce qu'on lui a posé la question que vous avez soulevé sur le problème des cocktails que dans le café il y avait 250 substances différentes dont certaines étaient cancérigènes. Il avait aussi dit que ce n'était pas pour ça que la plupart des gens proscrivait le café de leur alimentation. Sur le point du cocktail je voulais apporter tout à l'heure plusieurs précisions, B Declercq a déjà fait la distinction entre le non-sens toxicologique d'additionner des substances qui n'ont pas le même effet biologique, ça ne veut rien dire toxicologiquement parlant, c'est le premier point qu'il faut indiquer. Ensuite il est vrai que la communauté scientifique réclame depuis longtemps ce type d'études, je dois indiquer que très récemment, j'ai évalué une étude qui est une action nationale de recherche pilotée au sein de l'INRA et qui pour la première fois va prendre en compte le sujet d'éventuelles interactions des produits phytosanitaires entre eux. Pour ce qui est des substances naturelles, ce n'est pas parce que c'est naturel que c'est forcément 'safe', il y a un certain nombre de substances toxiques naturellement présentes dans nos aliments.

Pour la deuxième question c'est là aussi un problème aigu qui inquiète tout le monde. Il y a plusieurs éléments de réponses possibles, le premier que j'utilise souvent, c'est le rapport du Comité Protection Prévention (CPP, 2000) qui était une auto-saisine de Dominique Voynet à l'époque et qui quelque part, s'était un peu auto-répondu. Dans ce document, il est clairement indiqué qu'il n'y a aucun argument qui permet de faire un lien direct de cause à effet entre utilisation de produits phytosanitaires et cancer, ça c'est le premier élément de réponse. Ensuite il y a en a une autre, c'est que la Mutualité Sociale Agricole n'a jamais fait état de ce lien. Cela me permet de faire un petit distinguo entre la notion de risques consommateurs et de risques opérateurs, et je mets bien en garde tout le monde, les journalistes en particulier, de ne jamais faire l'amalgame et de ne pas transposer directement des effets qui ont pu être observés chez les opérateurs aux effets que l'on pourrait éventuellement supposer chez les consommateurs. Le niveau d'exposition est tellement différent qu'on n'a pas le droit de faire cette translation que certains médias ne se privent pas de faire à l'envie, c'est un point important que je dois signaler. Ensuite Isabelle Baldi, une épidémiologiste (INSERM – Bordeaux) a montré qu'il pouvait y avoir une relation de cause à effet entre certaines pathologies observées

chez les opérateurs et l'exposition aux produits phytosanitaires, mais quelqu'un de la même équipe a clairement indiqué dans le Journal de l'Environnement, je crois au mois de janvier dernier, qu'il n'y avait aucune preuve que l'on pouvait imputer un cancer de quelque type que ce soit à l'exposition aux produits phytosanitaires. Enfin, j'attends beaucoup d'une étude lancée par la MSA qui s'appelle AgriCancer qui, avec une cohorte très importante d'agriculteurs, pourra dans quelques années nous fournir des éléments de réponse. Voilà ce que je peux dire sur l'aspect pesticides et cancer.

B DECLERCQ : Pour la première partie en ce qui concerne les toxiques naturels, vous en avez de très importants, vous avez même des végétaux qui sont toxiques, des herbes, qui sont beaucoup plus toxiques que les pesticides. Il faudrait quand même rappeler aux gens qu'il existe des toxiques dont on ne parle jamais. Pour moi, ce qui est plus préoccupant pour l'alimentation du consommateur, c'est premièrement le risque microbiologique. On parle toujours des pesticides mais jamais on ne parle de ça. Je n'ai pas vu encore de morts directs de la consommation d'un fruit ou d'un légume qui a été contaminé par le pesticide, cela ne se voit pas, ce n'est pas palpable mais des risques sanitaires, des gens qui meurent d'infection par les microbes, ça, ça se sait, il y a des morts. Donc le risque dont on devrait parler tout le temps c'est celui là. Deuxième risque le plus important ce n'est pas les pesticides et on n'en parle jamais non plus, les mycotoxines. On aurait du en parler aujourd'hui, quelque part ça c'est grave et on aura de plus en plus de problèmes pour une bonne raison qui est qu'il y a de plus en plus de difficultés de garder la marchandise saine dans son stockage. Et si on diminue le nombre de pesticides, on va avoir de plus en plus de problèmes. Et si on n'utilise pas de pesticides sur les pommes on va avoir plus de patuline que les gamins vont consommer ou les bébés dans les pots de bébés. On est fou ! On n'est pas raisonnable !

The EU Coordinated Monitoring Programme and Rapid Alert System for Pesticide Residues

Luis MARTIN-PLAZA

European Commission, France

We have heard here many things that I can not talk about as there is not enough time. The issue is the coordinated monitoring programme and rapid alert.

I work in a unit which is dealing with chemical contaminants pesticides and although there are using under the good agricultural practice, in fact there are not desirable on the food that is why it is treated in this unit.

To put you in the frame, we have a lot of horizontal legislations including more or less all the food chain and then I try to point out things about the control on each of them. We have also legislation more particularly focused on pesticides and pesticides residues. The Food Law is umbrella of the legislation coring all the food chain and trying to protect the consumer with food on the market without risk. Another very important regulation is the regulation R 882/2004 about official controls to ensure the verification of compliance with food and feed law. This is also very important in the control because these regulations talk about the sampling, about the control of state members, the plan that state members have to do, also about the traceability of the products and also about the community different labs and official labs in general. If we want to talk about control we have to keep in mind who is doing the control, they are official labs. I would say that in Europe in F&L areas we have almost 200 official labs but the control on F&L of pesticide residues is done by the official control of the member states but there are big mount of control that are under the food business operators. In fact the food business operator does not want to have the risk to put food on the market so they make a lot of control. So maybe the results of our monitoring are not so bad or not so good, depending on which side you look at this. They are not so bad because the private sector is doing a lot of control itself. The next important regulation is the regulation R 852/2004 where it is precisely here where the entire obligation for the food operators is defined. All the food business operators should be registered; they have to do an analytical control point and HACCP system. Briefly the legislation on pesticides, we have two kinds of legislation. One is about marketing and uses of plant protection products and another one is pesticide residues. The first one is the directive D 91/414 and in this moment there is a new proposal for regulation in the process at the parliament in the council to decide about the proposal made by the commission. There is some improvements of the directive 91/414 from the 1990's, it is quite old. The maximum residue level (regulation 396/2005) is quite new; in fact, the full application of this regulation will start from September 2008 so, so far we are still under the previous legislation. There is also another piece of legislation on pesticides that is the thematic strategy on the sustainable use of pesticides. This is more related to the environment and this is done by another DG in the Commission.

Talking about the pesticides legislation we cover food plant and animal origin so not only F&V. The first directive 91/414 is going to be replaced by a new regulation hopefully at the end of this year. There is a share of responsibilities in the evaluation of the pesticides in one side is at the EU level the active substances (AS) that are going to be evaluated thanks to the evaluation of the risk. The evaluation of the risk is done by EFSA that is doing the evaluation of the active substances that are more or less 1200 AS in the market in Europe. After this evaluation the growers will lose 2/3 of them because safety, economical reasons. The member states are responsible of the control of marketing and uses so the Commission *makes some evaluation* and Commission member states take the reasonable management of these opinions and then they are still responsible for the uses and marketing of these AS. The new proposal of the regulation established a new tool for the control that the Food and Veterinary Office (FVO) will or have now the legal basis for doing also control on marketing and uses because so far the FVO which belongs to the commission do the regulation even if there were not legal basis but they do it. Now with the new proposal, the FVO will also make inspections on the uses and the marketing of the AS. About the regulation 396/2005, it is very important that the market is going to be clear because so far there are national maximum residue levels, EU-MRLs, national-MRLs so it is a kind of mess. We have harmonized all the MRL in Europe and we have reduced the amount of levels of pesticides around 90% of the current situation. There were more or less 500 000 MRL between EU and national-MRLs and now there will be 50 000, it is still a lot but for the importers and for the growers the situation is clarified because they know depending on where the crop is going to be sent they had to check which MRL applied in each of these countries. At least now, there will be just one MRL in the regulation, in the current directives, on the current legislation, the FVO also make control of the MRL. For the thematic strategy, as I said it is more for the environment but they make for example control of ... devices for the application.

So we have two kind of controls, one is the official and one is food business operators control of pesticide. Both are imposed and are legal obligation to do it. So marketing of plant protection product is before the use and then how we take the food itself we have several tools and three of them are the national programs; the Coordinated Monitoring Programme and Rapid Alert for Food and feed and then food business operators controls of pesticide that should have under control the food that they put in the market, they should know that there is not risk for the consumer and the reality is that they should not take risk for any food that they put in the market as they make self control. The main actions are these. Now from this year, it will change the name and will be coordinated multi annual community control program. Another action is the official laboratories network that is going to be developed since the Community Reference Labs (CRL) has been set in June 2006, before there were some kinds of networks of course but now we want to reinforce this network of

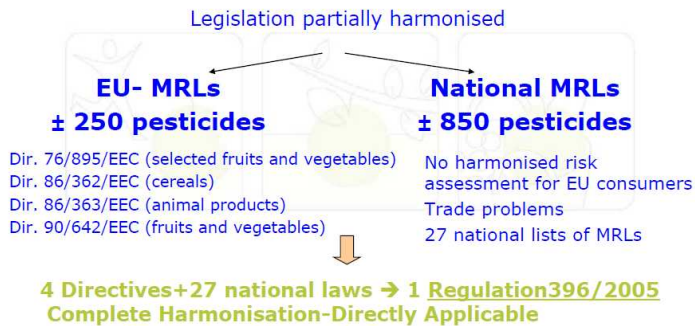
official labs. We are running Proficiency Tests where we are taking the official labs and one of the consequences of this is that the official labs are ranking and they try to be better every year so the quality of the control has improved. Then the national control programmes in the new regulation, there are some specifications as for instance they have to present the data on the internet, they have to present the program to the commission specifying the sample to take, the pesticides, the food and so on. Another action under the control point of view is that the official labs have improved since 1996 with the Proficiency Test running and then now the average of substances that the official control can look at is 155. We try to apply *multicultural* methods and try that this amount of pesticides be solved increases to 250. Also very important they are able now, with new methods, new equipment and applying the quality control guidelines they can now look at lower levels as e.g. 1...b that before in the baby food had no scientific basis and in the way today and tomorrow there will be because of new equipments and methods are developed.

The Rapid Alert System corrects the rapid actions for third countries and member states and also takes legislative measures. An MRL as the other tool as my colleague said should not be considered as safety limits, they are based on good agricultural practice but they do not have to raise toxicological concerns. So if a MRL result is above it does not mean automatically that there is a risk for the consumer, there is always a risk assessment to do (we also have guidelines on doing the risk assessment), EFSA is also behind the risk assessment and they are also going to participate in the development of Rapid Alert Guidelines.

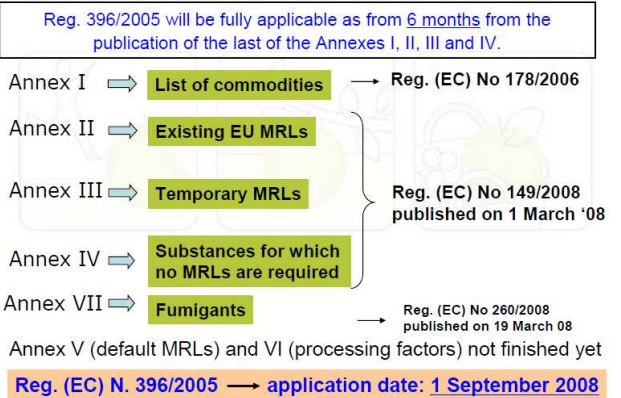
Just to point out some issues of the Coordinated Multiannual Community Control Programme, the most important is that it is always risk-based because now we have increased the number of commodities in our harmonized list in Europe that does not mean that all member states have to look at MRL focused. No, MRL is a science. For example when there is an excess of MRL in tea, it does not mean that the next day all the member states have to put a lot of effort in looking at excess of MRL in tea when tea is not a factor in the diet that makes a lot of difference, it is not a big factor in the diet.

The objective of the control plan is to assess the consumer exposure and to see if the application of the current legislation is applied in a good way or not. Normally we have cycles of three years with 20-30 food products who are the main components of the diet. To facilitate the control we have introduced for September 2008 a default value of 0.01. The pesticides to be sought increase yearly so e.g. in 2007 it was 47 and in 2008 it was 82 and in 2009 our target is to put 196 substances. Baby food and organic farming is also checked in the plan. Before there was no legal basis to look at pesticides and residues in animal products but now we are going to incorporate it in our regulation and the report is published every year.

Pesticide Residues MRLs setting

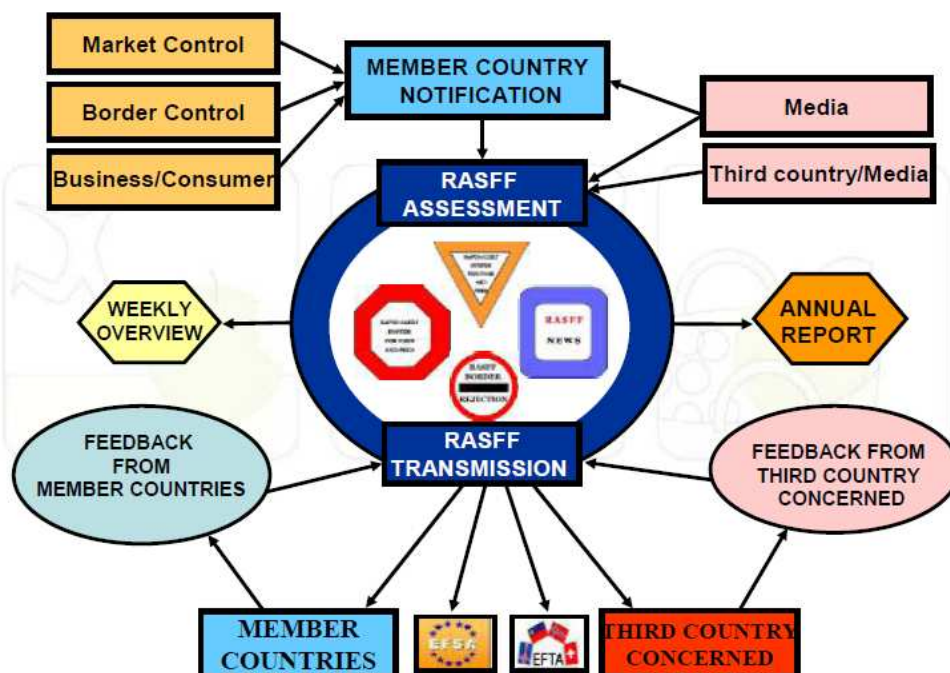


Implementation of Reg. (EC) 396/2005



The Annex I, II, III and IV were the requirements to the regulation to be applicable; 6 months after this to be published there will be a full application of the regulations.

And then the Rapid Alert system where we have changed a little bit the concept. Before it was alert information and news and from now we are going to alert and information meaning that the product is still on the market. Border rejection is when the product did not arrived or did not entered into the community and then the same, news. When we are going to put alert notification, there is a serious risk in the food, the product is on the market because many times the product is already consumed and in this case it will not be an alert in modification, it will be information and modification because the system always collapse if we put a lot of alerts when there is not a real alert it is an information to be prevent in the future maybe the same producer will be the same problem. So notification when there is a serious risk but not rapid action is required, border rejection is clear and news are other things that are not communicated as an 'alert' or modification.



In 2006 there were only 3.3% rapid alerts on pesticides, in 2007:6.2% and 2008 so far there was 5% on pesticides. It looks like it is increasing but the rapid alert system does not mean to have this consideration because we always get the information about the wrong things, not how many controls have been made so we know the numerator of the fraction but not the denominator. So we can no say that the pesticide residues is a problem because it is increasing as maybe in 2007 there was more because it was more targeted and they were looking only at specific commodities on specific producers.

The main conclusions are that you see that there is an increase of the legislative effort at the EU level, the legal obligations not only for member states and E. Commission but also of the food business operators, there are more pesticides to control and at lower levels, official labs are working under harmonized policy control procedures, the level of MRL excess in the EU remains between 4 and 5% so did not change. So I would like to give confidence to the consumers that at all stages there are great efforts to protect them against any potential problem due to pesticide residues.

These are the documents you can fin on the internet:

❖ DG SANCO webpage

http://ec.europa.eu/dgs/health_consumer/index_en.htm

❖ Pesticide Residue Legislation

http://ec.europa.eu/food/plant/protection/pesticides/index_en.htm

❖ Pesticide monitoring reports:

http://ec.europa.eu/food/fvo/specialreports/pesticides_index_en.htm

❖ RASFF

http://ec.europa.eu/food/food/rapidalert/index_en.htm

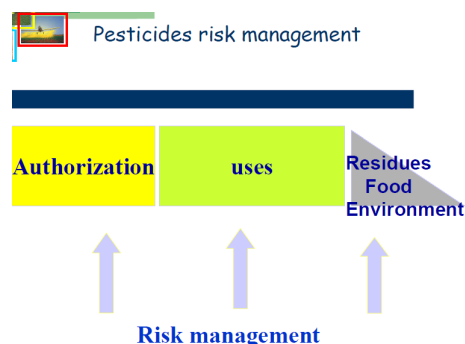
M. DUNIER-THOMANN (Président of the session): Merci de nous avoir guidés dans la complexité de la législation européenne d'une façon aussi détaillée.

Management du risque des pesticides en France

Florence GERAULT

SRPV Pays de la Loire, Angers, France

Ce management du risque intervient à trois niveaux, au niveau des autorisations de mises sur le marché ou des retraits, au niveau des usages et au niveau des résidus dans l'alimentation et l'environnement. Tout d'abord la situation en termes de séparation de l'évaluation de la gestion du risque a évolué relativement récemment en France puisque depuis septembre 2006 c'est le Ministère de l'Agriculture qui est en charge de la délivrance des autorisations sur le marché des produits phytosanitaires sur la base d'avis de l'AFSSA qui est en charge de l'évaluation.



Cette évaluation est une évaluation de la validité scientifique des dossiers qui sont fournis par les firmes phytosanitaires et une évaluation de la balance bénéfice/risque. Cette balance n'est pas dans le sens où on peut l'entendre d'un point de vue nutritionnel mais c'est la balance bénéfice/risque entre l'intérêt pour la production et pour la protection phytosanitaire du produit et les risques pour l'opérateur, le consommateur et l'environnement. L'AFSSA a également des recommandations d'usage. Donc de gros moyens humains ont été mis à la disposition de cette agence pour produire des évaluations plus rapides, c'était un point un peu bloquant ces dernières années dans notre système. Donc l'objectif est de plus d'efficacité et de transparence dans l'évaluation.

Le contexte de la gestion du risque change au 1^{er} Sept. 2008 au point de vue des LMR puisqu'elles ne seront plus fixées qu'au niveau communautaire. Cette proposition de l'AFSSA et de l'EFSA, les LMR sont soumises au vote des états membres et de la Commission mais on intervient quand même en tant que manager du risque à ce niveau là notamment pour deux propositions, pour des LMR plus adaptées à la réalité des bonnes pratiques agricoles et également pour contribuer à définir le cadre de ces évaluations de LMR. Je pense en particulier pour nous aux petites cultures plantes aromatiques et médicinales qui sont pas mal produites en France et qui se retrouvent couvertes de façon très exhaustive par ce nouveau règlement pour lequel on doit être force de proposition qu'on ne se retrouve pas dans une situation bloquante avec une absence d'autorisation du fait d'une mauvaise définition des règles d'évaluation des LMR. C'est un exemple particulier pour lequel on doit rester force de proposition dans ce dispositif communautaire. Ensuite, la mise en place de ces LMR communautaires au 1^{er} Sept on travaille dessus par anticipation depuis un an, on doit assurer la conformité des autorisations françaises à ces nouvelles LMR avec des retraits si nécessaire ou des adaptations d'usage. Là on a une position assez

directive qui ne se fait pas forcément comme ça, laissé à l'opérateur. Nous demandons à chaque fois que les LMR se retrouvent inférieure à la LMR française qui est aujourd'hui toujours en vigueur, on demande aux firmes de fournir la preuve que les pratiques agricoles qu'elles défendent vont pouvoir respecter ces nouvelles LMR. Dans le cas contraire, on peut aussi s'appliquer au travers de notre réseau d'expérimentation pour développer des nouvelles pratiques qui vont être conformes à ces nouvelles LMR. Ce réseau d'expérimentation des LMR est pour nous un outil de risque. En France il représente 18 sites de bonnes pratiques d'expérimentation dont 5 qui font des effets résidus qui peuvent contribuer à la fixation des LMR donc qui sont bonnes pratiques de laboratoire également. Les objectifs qui nous concernent sont de trouver des solutions pour les usages mineurs pour lesquels les firmes n'ont pas forcément un intérêt économique à développer des demandes d'autorisation et des essais résidus. On peut être amené à travailler jusqu'à ce stade dans notre gestion à mettre en place nous-mêmes des essais sur ces usages.

Les autres outils de gestion du risque sont donc les plans de surveillance. Pour nous au Ministère de l'Agriculture depuis les années 90 avec pas mal de données produites depuis cette époque et on voit majoritairement sur le F&L justement avec un bilan globale, sachant que ça ne veut pas dire grand-chose c'est toutes cultures confondues toutes années confondues mais, de l'ordre de 3% de dépassement de LMR sur l'ensemble de ces plans. Les objectifs initiaux étaient d'établir des bases de données de niveau de résidu dans les productions avec constatation en particulier au fur et à mesure qu'elles apparaissaient des nouvelles SA à usage mineur et de vérifier la conformité aux LMR mais spécificité plus agricole d'établir des relations entre les niveaux de résidus et les pratiques agricoles ce qui consistait à l'époque d'avoir des plans d'action concertés avec des agriculteurs volontaires qui communiquaient sur leurs pratiques, les doses et les délais avant récolte. L'objectif était éventuellement de mettre en évidence des pratiques qui pouvaient poser problème et trouver des solutions réglementaires et techniques. Globalement on peut dire que ça a donné satisfaction dans l'ensemble avec une plus grande application des producteurs puisque cela concerne et est d'appliquer la mise en place de ces plans qu'on pouvait obtenir des résultats même en cours de plan. A titre d'exemple j'évoquerais les surveillances des endives où sur un plan de 3 ans, entre la première année et la dernière on est passé de 21% à 2% de dépassement de LMR. Cela a été une forte implication de la Fédération Nationale des Producteurs d'Endive à l'époque. C'est un résultat assez probant. On a aussi mis en place des expérimentations quand on constatait des dépassements de résidus répétés, je pense en particulier aux dithiocarbamates sur les salades d'hiver où on a pu affiner par l'expérimentation mise place par le Ministère des conditions d'application qui permettaient de garantir les LMR. Et là, on touche du doigt une limite de ce type plan puisqu'en fait on constate encore aujourd'hui, à travers notamment la Répression des Fraudes que ce problème est persistant malgré la mise à disposition des producteurs de pratiques bien cadrées pour pouvoir garantir le respect de LMR. On constate encore des dépassements fréquents et permanents. C'est donc un peu une limite des

plans de surveillance tel qu'on le concevait jusqu'à présent. A côté de ça on a aussi la montée en puissance chez nous des plans de contrôle et pour toutes ces raisons on a une évolution de notre approche des plans de surveillance, depuis cette année, on part vers des plans qui restent toujours représentatifs des zones et des modes de production mais plus systématiques et obligatoires c'est-à-dire plus sur la base du volontariat et de la participation du producteur mais de façon plus obligatoire et en clair mis en œuvre par les agents en charge du contrôle de nos services. Ce sont donc des plans de surveillance de type états des lieux et pré-contrôle si nécessaire. Une spécificité au Ministère de l'Agriculture par rapport à ce qui peut se faire à la Répression des Fraudes c'est qu'on va définir la liste des produits à rechercher vraiment conformément à ce qui est utilisé sur la culture non pas sur une liste de produits identifiés comme prioritaires pour des raisons toxiques mais on veut faire un point vraiment des produits qui sont utilisés sur la culture et si besoin en appliquant des méthodes spécifiques c'est-à-dire même des produits qui ne seraient pas détectables au niveau des résidus, on ne les écartera pas si ils ne sont pas importants sur la culture. On mettra en place des analyses spécifiques en abaissant autant que possible les limites de quantification pour qu'également ces analyses soient utilisables par l'AFSSA en terme d'exposition du consommateur, ce qui n'était pas le cas jusqu'à présent des résultats de nos plans. Par ailleurs, par exemple en 2008, on va s'attacher à un plan de surveillance sur les carottes et on va suivre les produits très récemment interdits sur cette culture mais aussi ceux qui sont très récemment autorisés y compris parfois obligatoires. Donc on va voir un état des lieux de la culture précis.

A titre d'information et cela n'a pas à voir avec la filière F&L mais pour dire le genre d'approches qu'on peut avoir en plan de surveillance, on a aussi des plans de surveillance qui sont de l'ordre de la surveillance post-homologation où l'on va surveiller thiametoxame sur maïs, les effets non intentionnels des traitements et également un plan de surveillance d'un contaminant, le chlordecone, dans l'alimentation animale suite à la mise en place de limite maximale de résidus dans les produits animaux qui vont s'intéresser à l'éventuelle présence de résidus dans l'alimentation du bétail et faire le lien avec la teneur le produit animal final.

Donc comme je vous disais on a développé depuis peu, depuis 2004 le contrôle au sens strict contre le résidu au Ministère de l'Agriculture avec une répartition des compétences qui est la suivante : les contrôles à la mise sur le marché sont de la compétence du Ministère des Finances et du service de la Répression des Fraudes qui font beaucoup d'analyses sur les F&L, en 2006, sur 400 échantillons, 70% de l'échantillon français dont 800 échantillons de contrôle ciblé permettent de vérifier la conformité du produit végétal et également d'être utilisé pour l'évaluation de l'exposition du consommateur. Notre compétence est complémentaire au Ministère de l'Agriculture puisqu'elle se situe avant la première mise sur le marché. Notre contrôle intervient en fait chez le producteur et le contrôle résidus n'est pas une fin en soit pour nous, c'est un outil du contrôle à l'utilisation du produit. Notre compétence est de vérifier que les bonnes pratiques agricoles sont appliquées et de

vérifier que le respect des conditions d'utilisation qui sont définies dans l'autorisation de mise sur le marché. Il y a à peu près 6000 contrôles prévus cette année dans les exploitations agricoles et 800 contrôles résidus seront faits sur la base de cette évaluation de la bonne utilisation des produits. Cette programmation est également faite sur la base d'une analyse de risques régionaux. Ce sont nos services régionaux qui évaluent les exploitations, les cultures à risque pour vérifier la bonne utilisation des produits donc c'est sur cette base là qu'est programmé le contrôle. Les échantillons sont donc prélevés au champ éventuellement avant la récolte parce que qui dit bonne utilisation des produits veut parfois cibler un risque d'utilisation de produit interdit et dans ces cas là on va se mettre au plus près de l'utilisation potentielle du produit et pas nécessairement agricole. A titre indicatif, en 2006 sur 781 contrôles résidus que nous avons effectués, les non conformités étaient de 4% avec moitié de nos conformités strictement LMR (2%) moitié détection de produits non-autorisés (2%). Les actions prises derrière ces résultats sont de différents niveaux, cela peut être du simple rappel à la réglementation à un très faible dépassement de LMR par exemple jusqu'à la notification de destruction et également la transmission aux Directions Départementales de l'Agriculture dans le cadre de la conditionnalité des aides PAC puisque nos contrôles s'inscrivent dans le cadre de l'obligation communautaire de contrôler les exploitations qui touchent des aides pour vérifier qu'elles appliquent bien les conditions d'autorisation de mise sur le marché des pesticides. Et puis cela peut prendre la forme de mesures judiciaires de transmission au Parquet ou bien de programmation selon contrôle. Voilà un peu le panel de ce qu'on peut prendre comme mesures derrière un contrôle non conforme. Suite au Grenelle de l'Environnement on met en place un projet Ecophyto 2018 qui vise à retirer du marché les pesticides les plus dangereux et à diminuer de 50% quantitativement sur 10 ans l'utilisation des pesticides. C'est un chantier qui s'ouvre.

SESSION 17

VALUE AND ORGANISATION IN AGROFOOD CHAIN

Chair: **E Valceschini**

- Introduction. **E Valceschini**
- Stratégies de qualité comme sources de valeur. **E Valceschini**
- Valeur des F&L - Approche consommateurs. **P Gurviev**
- Création de valeur dans les alliances de marques - Cas du commerce équitable sur le marché des fruits. **M Coulibaly**
- Brand equity & co-branding in the fruit and vegetable sector. **M Gonzalez-Diaz**

Introduction

Egizio VALCESHINI

INRA DARESE, Paris, France

La session qui va nous occuper tous ensemble porte sur la création de valeur et l'organisation des filières agroalimentaires. La question de l'organisation des filières est une question qui est ancienne en particulier dans le secteur des F&L. En France notamment, mais d'une manière générale en Europe et de par le monde, l'organisation de cette filière est et a été un problème d'orientation politique important. Il est un problème économique important. Vous savez par exemple qu'au niveau européen il y a eu une réorganisation de l'organisation commune des marchés qui concerne l'organisation des filières et évidemment la filière des F&L est particulièrement concernée par tout ça. Au fond, la question que nous voudrions traiter avec les intervenants c'est comment peut-on contribuer à la création de valeur puisqu'au fond si on s'organise c'est dans le but de créer de la richesse ou de l'intérêt pour le consommateur et aussi pour les producteurs. On a pris le parti avec les organisateurs du sommet de se poser la question un peu du point de vue des consommateurs et c'est Patricia Gurviez qui nous donnera un point de vue des chercheurs sur la manière dont on peut appréhender la perception des consommateurs, il y a d'autres approches mais elle va nous présenter un point de vue particulier. D'un autre côté on va aussi essayer de voir comment les producteurs au sens des filières peuvent s'organiser eux-mêmes pour produire de la valeur et on verra qu'au fond elles ont des marches de manœuvre qui sont bien plus importantes qu'on ne le croit en général et qu'il y a des innovations et c'est un des points sur lequel je voudrais insister. Une des raisons pour lesquelles j'ai choisi les intervenants c'est parce que j'ai pensé que les approches qu'ils allaient nous présenter étaient assez novatrices par rapport à des approches qu'on avait généralement. Sachant qu'une des caractéristiques des filières F&L, dans le cas des F&L frais parce que les F&L transformés obéissent à une autre logique, une autre problématique mais une des particularités des F&L frais c'est d'utiliser assez peu jusqu'à ces dernières années des stratégies de segmentation et de différenciation par des signes de qualité que ce soit des marques ou autres signes officiels de qualité. Pour ne prendre qu'un exemple ce n'est que très récemment qu'il y a une pomme qui a reçu une AOC (la pomme du Limousin). Les marques sont en revanche plus contrôlées dans les pommes mais d'une manière générale dans les F&L les marques sont assez peu développées et c'est un des aspects que nous allons étudier dans cette session.

Aussi, une des choses qui est assez peu étudiée mais cela n'est pas particulier au secteur des F&L et qui est une notion d'originalité dans les présentations c'est que les stratégies de qualité repose sur l'information donnée au consommateur mais on confond souvent information et étiquetage ou information et publicité ou information et marque. En réalité c'est beaucoup plus compliqué que ça et les stratégies d'information jouent un peu sur tous les registres. Un moyen qui est

relativement nouveau de jouer sur divers registres c'est ce qu'on appelle le 'co-branding' qui est associer à deux marques. On voit de plus en plus par exemple les AOC s'associent avec des marques de distributeurs ou bien deux marques d'entreprises différentes (ce dont va nous parler Madame Coulibaly), qui s'associent pour créer, essayer d'envoyer des messages, qui se renforcent les uns les autres d'une certaine manière. Et puis, les sources de valeur sur lesquelles je vais beaucoup insister moi-même qui sont évidemment l'organisation de la filière et ça, l'expérience nous montre que les filières qui produisent de la valeur sont des filières très organisées. Pour autant, il ne suffit pas d'être très organisé pour produire de la valeur. C'est une question sur laquelle on va s'interroger.

Manuel Gonzalez-Diaz va nous parler de la filiale et de stratégie dans les filières F&L et il va nous parler d'une stratégie qui est une comparaison de divers cas européens à travers une même grille et à travers une interprétation et des conclusions qui sont particulièrement intéressantes. Je le remercie donc d'avoir fait ce déplacement d'Espagne pour nous livrer ses résultats.

Stratégies de qualité comme sources de valeur

Egizio VALCESHINI

INRA DARESE, Paris, France

Comment et pourquoi les stratégies de qualité produisent de la valeur ? Il faut d'abord indiquer qu'est ce qu'une stratégie de qualité de façon à ce qu'il n'y ait pas d'ambiguïté. D'abord une stratégie de qualité c'est une stratégie de différenciation donc qui d'une manière ou d'une autre, soit en jouant sur le produits à travers l'innovation par exemple, soit en jouant sur les systèmes de contrôle et de gestion de production vont se différencier d'autres stratégies ou d'autres produits. On peut aussi, en jouant au niveau de la production utiliser les différences de localisation ou les particularités locales ou territoriales, c'est évidemment les stratégies d'AOC par exemple qui sont aussi des stratégies pas simplement liées à la différence de localisation mais à la mise en place d' « actifs spécifiques » liés au terroir, au savoir-faire, à quelque chose qui finalement et indissolublement est lié à un lieu et tout ce qui concerne ce lieu et c'est pour ça qu'on parle d'actifs spécifiques. On peut évidemment se différencier en jouant sur la perception des consommateurs en jouant au niveau du marché à travers des investissements qui concernent la formation, l'étiquetage, le packaging, la publicité mais qui peuvent concerner aussi des circuits de distribution très particuliers. Deux exemples totalement différents, quand la marque de glace Häagen-Dazs a commencé à introduire le marché français était distribuée dans des armoires frigorifiques particuliers dans des supermarchés ; les parfums Guerlain pendant très longtemps n'ont pas été distribués dans des supermarchés ou dans des magasins généralistes mais avait leurs propres magasins. Donc les circuits de distribution sont aussi une manière de se différencier. Jouer au niveau de la perception des consommateurs ce n'est pas simplement jouer comme on l'entend souvent à travers l'idée de convaincre le consommateur par la publicité, la panoplie de stratégie est bien plus large. Donc premier élément de stratégie de qualité c'est, la différenciation. Mais, c'est une stratégie de différenciation par l'information sur la qualité.

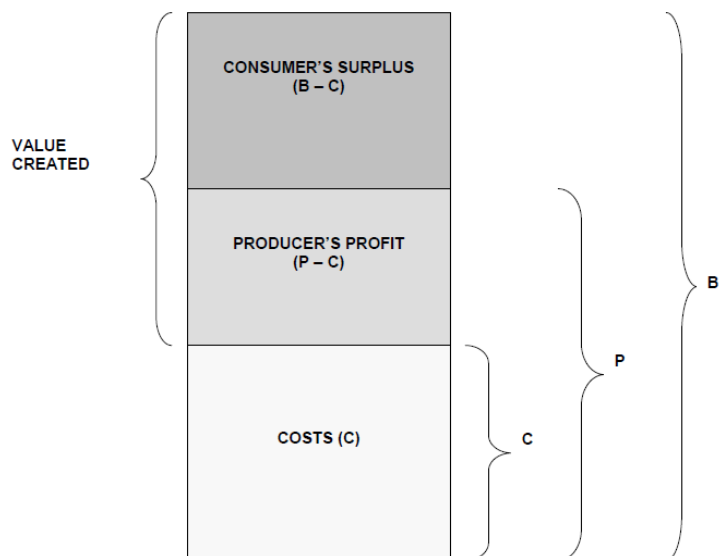
Cette différenciation ne va pas simplement jouer sur des caractéristiques intrinsèques du produit, sur ses caractéristiques technologiques mais va jouer sur l'information associée à ce produit et à ses caractéristiques. Une bouteille d'Evian, admettons qu'elle coûte 2€, la même bouteille sans l'étiquette coutera peut-être 1€. Cela veut dire que l'étiquette donne une valeur supplémentaire qui est de 1€. Cela veut aussi dire que l'information qui est sur cette étiquette amène une valeur de 1€. Donc cela signifie bien qu'une stratégie de qualité n'est pas une stratégie de produit, c'est une stratégie d'information sur le produit, sur le process, sur les méthodes de productions, sur les origines mais c'est une stratégie d'information. Mais pas n'importe laquelle et on va approfondir sur cette réflexion.

Le troisième point est que c'est une stratégie d'information qui va créer une information qui va être le plus facilement accessible possible au consommateur. Pour le dire de manière rapide, c'est une stratégie d'information sous forme de résumé de l'information. Autrement dit, il ne s'agit pas de donner des encyclopédies avec les produits, il s'agit de donner des résumés d'information avec les produits de façon à donner une compréhension supplémentaire sur le produit ou sur les techniques de production mais de donner une information aisément accessible et rapidement compréhensible par les consommateurs. Donc ce qui a de la valeur ce n'est pas simplement l'information, c'est son accessibilité et son traitement. On va jouer sur la capacité de traitement de l'information du consommateur. Ce résumé d'information peut concerner certaines caractéristiques particulières concernant le produit, la production et en fait on va pouvoir dire que la stratégie de qualité va produire, créer de la valeur quand elle donne de l'information mais la valeur sera d'autant plus importante quand cette information est résumée succinctement et qu'il est efficace. Ce troisième point est fondamental parce qu'on est souvent dans une problématique où on dit qu'on donne de l'information au consommateur mais un des problèmes du consommateur n'est pas d'avoir de l'information, c'est de la trier et de la traiter. C'est un des problèmes qu'il a, pas le seul.

On est dans un cas de figure où on arrive à obtenir de la création de valeur. On voit bien sur ce graphique bien connu que la valeur créée ici, c'est la différence au-delà du coût de production, la part donnée au consommateur et puis la part qui est prélevée par le producteur. Ce sur quoi je voudrais insister ici, c'est peut-être trivial mais c'est que la valeur créée est distribuée entre le consommateur et le producteur. C'est-à-dire qu'il ne peut pas y avoir dans une stratégie de qualité, création

de valeur si il n'y a pas création de valeur distribuée. J'ai partagé de manière un peu démagogique, de manière égale entre le producteur et le consommateur mais ça n'est évidemment pas toujours le cas mais je veux dire que (...) pour des raisons économiques notamment d'incitation des producteurs on verra qu'il ne peut pas y avoir de création de valeur en faveur du consommateur si il n'y pas création de

Economic definition of value created in a chain



valeur pour le producteur ne serait-ce que pour inciter le producteur à respecter le cahier des charges et s'engager vis-à-vis du consommateur. Aujourd'hui, on sait depuis très longtemps, que pour créer de la différenciation on joue sur l'hétérogénéité des consommateurs. On joue sur les inégalités du consommateur aussi de revenus, de pouvoir d'achat, il ne faut pas le cacher même si on a tendance à le mettre un peu de côté. On joue également et c'est connu sur les changements de styles de vie, de modes de vie depuis 30 ans les modes de vie ont beaucoup changés et les modes d'alimentation aussi. Vous lisez n'importe quels articles dans la presse, on parle de ça. (...) Il y a de nouvelles demandes de qualité qui sont apparus et les quatre domaines essentiels qu'on connaît sont la sécurité, la santé et des demandes nouvelles et quasiment le Sommet lui est presque consacré à tous les aspects nutritionnels et là il y a du grain à moudre pour les producteurs (...), il y a tout ce qui concerne la satisfaction et le goût et là concernant les légumes par exemple la question du goût est importante mais on verra que ce n'est pas toujours aussi important que ça en réalité et puis, la question du service où là les légumes ont peut-être quelque chose à nous dire. J'ai vu par exemple qu'il y avait une machine à distribuer des fruits dans le hall, c'est la première fois que j'en vois une, voilà un exemple de service. Je ne sais pas si cela a du succès mais en tout cas c'est un exemple de service. Ce sont les domaines relativement traditionnels et puis évidemment il y a des domaines qui sont beaucoup plus émergents depuis une dizaine d'années, vous en connaissez probablement la liste, ça concerne tout ce qui attrait à la protection de l'environnement c'est-à-dire qu'aujourd'hui on demande que non seulement un produit est du service du goût etc. mais qu'il ne dégrade pas l'environnement ou mieux, qu'il participe à sa protection, à sa valorisation. Par exemple on voit bien dans la stratégie des AOC, je pense à l'huile de Nionce qui est valorisée parce qu'est valorisée en même temps l'ensemble du paysage Dromois et en l'occurrence au-delà de Dromois, c'est provençale en quelque sorte. Pensez à la route des vins où on valorise bien sûr le vin mais on le valorise à travers autre chose que le produit lui-même. Cette mise en valeur d'un patrimoine culturel qui se traduit à travers du paysage est toute la problématique de la biodiversité. Un nouveau champ qui s'est ouvert, c'est par exemple tout ce qui attrait à l'éthique. On pourrait parler du bien-être animal, mais on peut parler aussi des biens éthiques justement et notamment du commerce équitable par exemple.

Une des questions qu'on peut se poser va être pourquoi la formation et par-dessus tout les résumé d'information sont particulièrement important aujourd'hui ?

Première raison, c'est une raison que les économistes en particulier connaissent bien et que vous connaissez bien aussi dans votre comportement de consommateur, c'est qu'il y a une asymétrie d'information entre l'acheteur et le consommateur. Quand vous achetez de la viande, vous ne pouvez pas savoir avant de l'avoir goûtée si elle est tendre ou pas. C'est même pire que ça, même quand vous l'avez faite cuire, vous ne savez pas si on vous a donné de la bonne viande ou pas parce qu'en la faisant cuire vous pouvez détruire la tendreté de la viande. On est donc dans une situation

d'asymétrie de l'information qui est très forte. Une asymétrie sur la qualité du produit, une asymétrie sur est-ce qu'il y a des caractéristiques cachées, quand vous achetez une voiture d'occasion vous ne savez pas si les freins sont usés ou pas (...). Au fond on nous demande de l'information mais ce que vous ne savez pas c'est que vous ne faites que déplacer le problème parce que le problème que vous aviez sur le produit vous l'avez sur l'information : est-ce qu'elle est crédible, est-ce qu'elle est fiable ou pas ? Donc, donner de l'information en soi ne suffit pas. Cela est une situation traditionnelle qu'on connaît bien, malheureusement cela c'est encore exacerbé parce qu'aujourd'hui les vagues d'innovation font que les produits ne sont plus ce qu'ils étaient et il y a beaucoup de nouveaux produits qu'on ne connaît pas, dont on n'a pas d'expérience. Il y a beaucoup de produits qui sont très élaborés, qui mettent en jeu des ingrédients qui viennent d'un peu partout donc on a du mal à savoir exactement de quoi il s'agit. On a des circuits de distribution qui se sont allongés, vous achetez des champignons en Chine. Toutes ces choses font que finalement on avait des critères assez évidents et triviaux qui servaient de repère pour juger de la qualité qui ne fonctionnent plus. Un des critères essentiels c'était la provenance et l'origine qui ne peuvent plus fonctionner dans la connaissance commune. D'ailleurs, une des raisons fondamentales de la défiance des consommateurs lors des crises alimentaires des années 90 a été qu'ils ont découvert que les produits n'étaient plus fabriqués et n'avaient plus les mêmes origines que ce qu'ils pensaient qu'elles étaient. Par exemple beaucoup de gens ont découvert que les vaches ne mangeaient plus simplement de l'herbe ou du foin ou même de l'orcilage mais qu'elles mangeaient autre chose.

La deuxième chose qui rend tout ça beaucoup plus difficile est le fait que les nouveaux champs de qualité qui apparaissent, commerce équitable, tout ceux que j'ai cité plus haut, l'environnement, tout ça est vraiment difficile à mesurer et à observer. Comment voulez vous savoir et mettre en avant qu'en achetant tel produit vous sauvegardez telle partie du paysage ? Quel est le lien entre le fait que vous produisez selon un cahier des charges d'agriculture biologique et la sauvegarde de la nappe phréatique ? Cela veut dire que tout ces champs de qualité nouveaux qui sont investis par les silos et stratégie de qualité en fait sont non-identifiables directement par le consommateur, difficilement observables, difficilement mesurables etc. On est donc en situation où les consommateurs accordent de la valeur à quelque chose qui est difficilement identifiable et évaluable. C'est quand même un sacré problème.

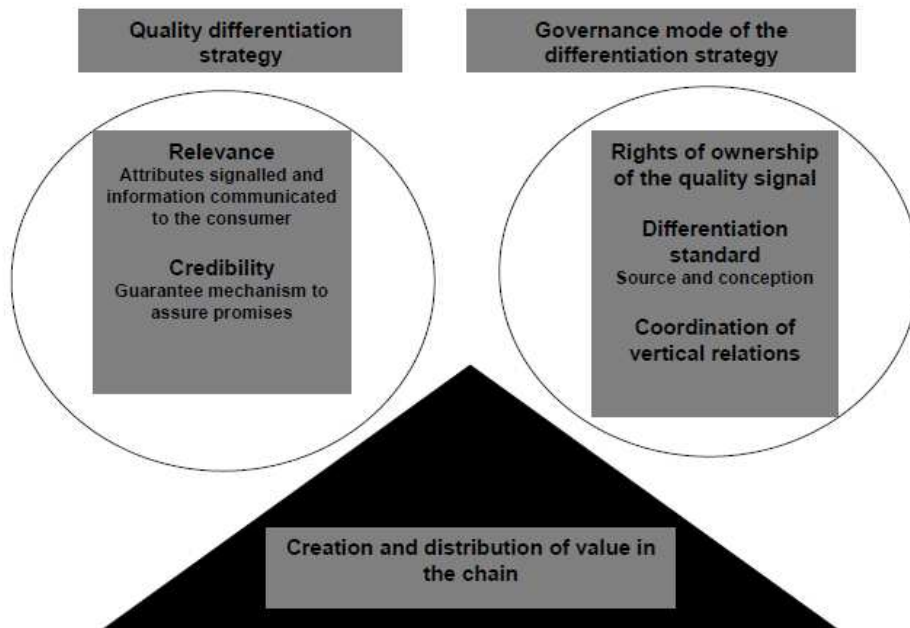
Les économistes ont analysés depuis très longtemps des systèmes pour rétablir quand il y a des asymétries d'information pour mettre l'acheteur et le consommateur en situation de symétrie et d'égalité d'information. Justement ce sont les stratégies d'information d'étiquetage et tout ce que j'ai mentionné avant qui sont un des moyens. Aujourd'hui la situation est telle que finalement on peut dire que les stratégies qui visent à réduire l'asymétrie d'information sont des stratégies qui sont le plus utilisées pour créer de la valeur. C'est un changement qui est fondamental parce que là où avant on pensait que ces stratégies étaient uniquement des stratégies

pour rétablir une loyauté des transactions sont aujourd'hui des stratégies de source de valeur. On est rentré dans une ère totalement différente.

Un des concepts clé pour comprendre tout ça c'est le concept de signal de qualité mais j'en ai parlé. Maintenant deux questions. Qu'est qui fait qu'un signal de qualité va créer de la valeur ? Selon moi il y a deux critères qui permettent à un signal de qualité de créer de la valeur. Le premier c'est la pertinence du signal de qualité, cette idée qu'au fond il va être utile au consommateur pour traiter rapidement de l'information. Au fond, un signal de qualité doit être vu comme une machine à traiter de l'information et prétraiter de l'information pour le consommateur. On verra que ce n'est pas simplement une question cognitive mais que (malheureusement) c'est quelque chose de plus complexe parce que nous ne sommes pas que des machines intellectuelles et même si on a des supports pour traiter de l'information il y a de l'émotion et plein d'autres choses qui surviennent. Mais en tout cas cette idée de machine à traiter de l'information est indispensable à comprendre donc quand vous vendez des signaux de qualité, ce qu'il faut voir c'est que vous ne vendez pas une machine à persuader les consommateurs, vous vendez une sorte de support au consommateur pour l'aider à faire quelque chose qu'il ne sait pas faire ou qu'il ne peut pas faire. Dans le cas par exemple des informations nutritionnelles, un des problèmes, c'est qu'on ne sait pas construire ces machines c'est-à-dire que c'est un des problèmes des allégations professionnelles, si elles ne fonctionnent pas forcément très bien c'est qu'on ne sait pas exactement sur quelle base il faut construire ces résumés d'information. La deuxième source de critère de signal de qualité c'est qu'évidemment il ne suffit pas de mettre 'Evian' ou un signal de qualité sur l'étiquette, encore faut-il que cette étiquette annonce quelque chose de crédible. Au fond un signal de qualité annonce une promesse, un engagement et quand vous promettez, quand vous vous engagez cela n'a de valeur que si c'est crédible. Si vous fournissez avant ou en même temps la promesse si vous fournissez la preuve que vous allez la tenir. Vous le voyez bien, quand quelqu'un vous promet quelque chose au fond vous ne le croyez que s'il vous donne quelque chose qui rend cette promesse fiable c'est-à-dire qu'il va la tenir. (...)

En conclusion, les stratégies de différenciation génèrent de la valeur non seulement parce qu'elle différencie des produits par rapport à d'autres. Il ne suffit pas de différencier un produit par rapport à un produit standard, il ne suffit pas de se différencier dans la perception par rapport au consommateur mais il produit de la différenciation aussi parce qu'il donne un résumé d'information donc une machine à traiter de l'information. Cette machine à traiter de l'information, elle doit être efficace et pertinente et elle doit être crédible.

MODELLING A STRATEGIC CONFIGURATION OF A VALUE CHAIN



Patricia vous dira que ce j'ai présenté est un aspect très limité c'est-à-dire que considérer le consommateur uniquement sous l'aspect cognitif comme s'il avait besoin de comprendre les choses, c'est une rationalisation bien particulière du comportement et de la perception du consommateur.

Valeur des F&L - Approche consommateurs

Patricia GURVIEZ

AgroParisTech, Massy, France

J'ai de multiples identités, je fais partie d'AgroParisTech, pour ceux qui auraient raté la fusion AgroParisTech c'est depuis 18 mois l'ENGREF, l'ENSIA et l'INA P-G, je suis aussi chercheur associée à Paris 12. Le travail que je vais vous présenter a été fait dans le cadre de l'expertise collective demandée à l'INRA par le Ministère de l'Agriculture. C'était un travail qui nous avait été demandé sur les enjeux déterminants de la consommation de F&L. Je suis intervenue dans la partie sur les déterminants de la consommation et les enjeux et notamment sur ce qui est ma spécialité c'est-à-dire les perceptions et les représentations associées aux F&L et c'est donc de cela que je vais vous parler.

Il est vrai que la différence entre ce que disent les économistes et les gens comme moi plutôt sur le comportement du consommateur marketing c'est quand on se demande ce qu'est la valeur d'un bien, on va plus chercher à savoir ce qu'est la valeur d'usage pour le consommateur c'est-à-dire qu'elle importance ce bien a aux yeux du consommateur, quel sens sa consommation a, alors que pour les économistes, et je caricature un peu, on est plutôt dans la valeur d'échange dans le prix de ce qui est échangé.

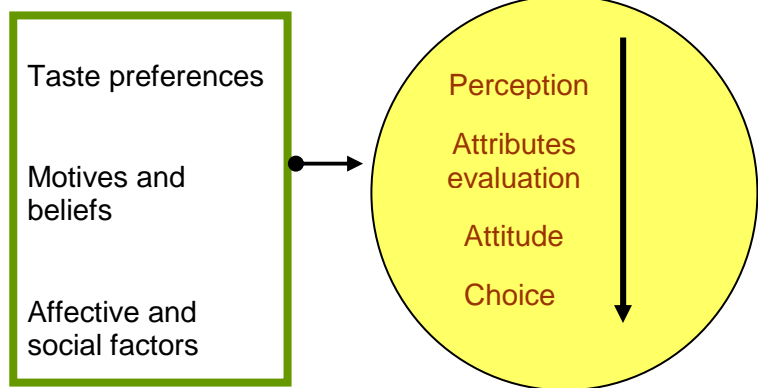
Pourquoi chercher à convaincre à manger plus de F&L ? Vous en savez sûrement encore plus que moi là-dessus, tous les experts s'accordent à dire qu'il vaudrait mieux qu'on mange plus de F&L, il y a des programmes qui ont été montés depuis pas mal de temps là-dessus, aux Etats-Unis on doit bien être à plus de 25 ans. Et puis finalement la consommation reste plus ou moins stable donc il doit quand même y avoir un petit problème et c'est à ce petit problème que j'ai essayé de m'atteler.

En ce qui concerne la méthodologie, je le redis encore une fois, c'était une partie de l'expertise collective donc on a travaillé sur une base de données d'environ 500 articles. L'idée était de vraiment faire le point des connaissances scientifiques dans le monde entier sur la question de la consommation des F&L. Dans ce corpus j'ai extrait 34 papiers qui étaient parus dans des revues académiques internationales plus 5 publications du CTIFL. Et, je me suis particulièrement intéressée à l'influence des perceptions et des attitudes sur les achats et la consommation des F&L.

Ce qu'on voit tout de suite quand on regarde tout ce corpus, c'est qu'il y a un modèle implicite. Et ce modèle implicite qui est derrière toutes ou la plupart des recherches que j'ai analysées ça ne défriserait pas un économiste parce que c'est la théorie de l'action raisonnée (Ajzen, 1991 & Fishbein, 1980), c'est-à-dire qu'en fait les influences cognitives sont des bons producteurs d'un comportement rationnel de consommation.

Ce schéma est un bon résumé :

vous percevez des signaux, vous évaluez les attributs et les caractéristiques des différentes alternatives qui sont à vous, tout ça va vous permettre de vous créer une attitude (la pêche ça salit les doigts, l'abricot il faut cracher le noyau) et puis finalement on choisit. Normalement tout ça



devrait plutôt se fonder sur les motivations et les croyances mais malgré la force de ce modèle de la théorie de l'action raisonnée, finalement, ça déborde toujours un peu et on est obligé de ramener les préférences de goût ce qu'on arrive pas forcément à rationaliser et puis toujours, à un moment ou à un autre il y a des facteurs sociaux ou affectifs qui interviennent qui font que cette belle machine rationnelle et cognitive qu'on aimerait que l'homme soit finalement elle est un peu crêpée.

Les conséquences de ce choix de modèle comme choix de vision dominante de la manière dont les consommateurs fonctionnent c'est que les programmes nutritionnels mettent essentiellement l'accent sur l'information nutritionnelle et l'éducation. Claude Fischler me fait toujours rire avec son petit cartoon un peu américain où l'on voit deux experts qui regardent passer des obèses dans la rue et qui se disent « quand même il faudrait peut-être se demander si les programmes nutritionnels ne font pas grossir ». Donc c'est vrai que la plupart des programmes nutritionnels mettent quand même l'accent sur l'éducation et je suis sûre qu'autour de moi il y a des gens qui sont persuadés que si enfin TF1 voulait bien donner un programme d'une heure à heure de grande écoute pour qu'on explique les bienfaits des F&L, ça marcherait, les gens comprendraient, seraient convaincus et aussitôt la consommation de F&L progresserait. Je suis désolée mais je n'en suis pas persuadée personnellement. L'accent a aussi été beaucoup mis sur les problèmes de prix bien sûr donc sur l'accessibilité financière et sur l'accessibilité physique accrue. Aux Etats-Unis notamment, il y a cette notion de désert alimentaire et c'est vrai que quand on lit certaines études ça fait peur quand on voit que des supermarchés dans le Texas où vous trouvez quelques pommes de terre mais pas de tomates, pour nous autre c'est un petit peu étonnant. Et puis des résultats pas forcément très forts, en tout cas incapables de modifier à long terme les comportements de consommation des F&L puisque certaines évaluations des programmes nutritionnels montrent bien qu'à court terme, en rendant les choses plus accessibles financièrement, plus accessible physiquement etc. on arrive à changer un peu les comportements mais que ça ne dure pas.

- « *Consumer value as an interactive relativistic preference experience* » (Holbrook, 1994; Holt, 1995)
- « *What consumers get (benefits, quality, worth, utility) from the purchase and use of a product vs what they pay (price, costs, sacrifices) resulting*

Ce que je vous propose c'est de plonger dans le marketing et dans la notion de valeur de consommation. On pourrait la définir à la suite de Holbrook (Holbrook, 1994; Holt, 1995) comme une préférence relative, comparative, personnelle, situationnelle, en gros cela caractérise l'expérience d'un sujet en interaction avec un objet. Vous avez peut-être déjà entendu des mots comme le 'consom-acteur', 'concostruction de l'offre' etc. et en fait tout ces mots là découlent un peu de cette notion de la valeur de la consommation. C'est-à-dire que ce qu'on achète, ce n'est pas une fraise, ce n'est pas un chou-fleur, c'est une expérience quand on va consommer cette fraise ou ce chou-fleur. Comment ça se mesure ? Difficilement. On va essayer de voir ce que le consommateur obtient de son achat mais seulement en termes de prix, en termes justement de bénéfices expérientielles etc. de qualité, de valeur d'utilité et comparer ce qu'il paie mais pas seulement le prix mais aussi tous les coûts, tous les sacrifices que cela implique et tout cela va résulter en une attitude ou bien un lien émotionnel avec le produit. Il y a eu pas mal de typologies des valeurs de la consommation qui ont été faites, j'ai fait une synthèse (voir tableau).

Dimensions de la valeur du consommateur

Synthèse des typologies publiées

	Orienté vers soi	Orienté vers les autres	Valeur Coût/ Sacrifice
Extrinsèque	Valeur Fonctionnelle/instrumentale : - utilisation - connaissance	Valeur Communication/Expression : - expression de soi - lien social	
Intrinsèque	Valeur Expérientielle/Hédonique	Valeur de Partage : - spiritualité - pratiques sociales	

(Holbrook 1999, Holt 1995, Aurier, Evrard et N'Goala 2004, Brock Smith et Colgate, 2007)

Evidemment il y a une valeur qui est celle qu'on appelle le coût /sacrifice qui sont en gros les coûts de transaction liés à l'achat, à la possession et à l'utilisation d'un produit. Et puis, ce qui est peut-être un petit peu plus original c'est cette distinction entre 2 axes, est-ce que c'est une valeur qui orientée vers soi ou orientée vers les autres et je pense à des gens qui ont une culture alimentaire latine c'est-à-dire que nous on ne mange pas pour alimenter le corps, la machine pour donner de l'énergie, on mange aussi pour la convivialité, la conversalité donc vous voyez bien l'idée que c'est orienté vers soi ou orienté vers les autres. Puis il y a également ces deux notions de extrinsèque ou intrinsèque c'est-à-dire soit le fait de consommer un fruit ou un légume qui va permettre d'obtenir un autre but dans le cas de l'extrinsèque par exemple quand on vous dit « mangez des F&L c'est bon pour la santé » là vous voyez bien que c'est extrinsèque. Soit intrinsèque, c'est-à-dire « waouh qu'est-ce que c'est

bon de croquer dans une fraise mûre » ou même dans une tomate donc vous voyez le côté hédonique. Il y a aussi d'autres dimensions de la valeur. La dimension de communication/expression qui peut se découper encore en deux volets, soit l'expression de soi, soit le côté lien social. Puis une valeur qui est plutôt du domaine du partage et qui là est une valeur plutôt spirituelle, de partage de pratiques sociales.

Revenons sur ce corpus en voyant si ces valeurs ont un sens dans les études qui ont été faites pour essayer de comprendre comment améliorer la consommation de F&L. La valeur expérientielle/hédonique, toutes les études montrent que le goût est un prédicateur fort de la consommation des F&L seulement cela peut avoir une influence négative parce que dans chaque étude quand on a demandé aux gens quels étaient les freins des F&L, on dit « c'est pas bon », « j'aime pas ça ». Je suis une maman particulièrement sensible à ce problème parce que j'ai un fils qui n'aime quasiment rien, jamais réussi à lui faire manger un chou-fleur, quand vous avez en face de vous un gamin qui dit « j'aime pas ça » je veux bien être censée lui apprendre mais la valeur hédonique elle compte et ça s'arrête souvent là. Il y a une hypothèse que je trouve intéressante qui a été montrée par les collègues en 1999, les consommateurs en comportements sont un peu pervers, ils ont fait une fausse expérience parce ce qu'ils voulaient mesurer c'était le choix en situation où on a des ressources cognitives qui peuvent être affectées le choix ou pas. Ils ont donc fait une fausse expérience et laissent les gens se restaurer, après seulement, dans un cas ils donnaient aux gens une liste de chiffres et leur demandaient de s'en souvenir et de la leur donner dans 5 min donc, une tâche cognitive. Et là, les gens avaient à choisir entre un gâteau au chocolat et une salade de fruits. Dans le contexte américain de 1999 il est évident que le choix rationnel c'est la salade de fruits mais quand vous devez vous souvenir en même temps d'une liste de chiffres finalement vous êtes plus amené à faire un choix affectif et vous partez vers le gâteau au chocolat. Au contraire ceux à qui on a dit qu'ils avaient bien travaillé et qu'ils avaient le droit de se restaurer en leur proposant un gâteau au chocolat ou une salade de fruits sans donner d'autre tâche, ils choisissaient raisonnablement, rationnellement, la salade de fruits. Donc de quels ressources cognitives dispose-t-on quand on choisit ce que l'on va manger?

Si maintenant on arrive à la valeur instrumentale/fonctionnelle qui est je le rappelle une valeur orientée vers soi mais dans laquelle la consommation en elle-même sert à obtenir un autre but. Une chose est certaine c'est que les bénéfices sur la santé de manger des F&L sont plutôt bien connus et plutôt bien acceptés, on a mesuré plein de fois l'orientation santé. Je viens de terminer l'analyse d'une vingtaine d'entretiens de consommateurs qui portaient sur autre chose mais en gros si on leur demande bien manger vous c'est quoi ? C'est manger des F&L, manger équilibré et manger varié et après en général au fur et à mesure ils avouent, ce n'est pas facile quand même mais ils le savent et ils l'acceptent. Simplement, les légumes sont quand même moins connus et surtout il y a une connaissance des légumes plus faible spécialement sur les variétés. Une chose qui m'attriste à titre personnel c'est ce savoir-faire culinaire

qui diminue et pas seulement en France, les études qu'on a analysées étaient dans le monde entier et partout il y avait cette notion que quand ne sait pas faire la cuisine il est compliqué bien sûr de faire cuire des légumes. Et puis finalement le fait qu'on vous dise que les légumes c'est bon parce que c'est moins calorique etc. ça veut dire aussi que ça contribue moins à la satiété donc ça peut être aussi un bénéfice perçu assez ambigu parce les gens veulent bien que ça soit moins calorique mais ils ont faim, ont envie de manger et besoin de se nourrir.

La valeur de communication est évidemment une valeur plus orientée vers les autres et plutôt extrinsèque là encore, on cherche à dire quelque chose aux gens parce qu'il n'y a pas beaucoup de données. Cette valeur sort du champ de ce modèle implicite. Par contre j'ai pu trouver quelques données autour de l'aspect de l'expression de soi notamment dans des études plutôt sociologiques. Par exemple il y avait des éléments dans le domaine de la socio qui montraient que c'était quand même des marqueurs symboliques et que les F&L étaient finalement plutôt des marqueurs symboliques de la féminité, la viande étant plutôt un marqueur symbolique de la masculinité. Deux chercheurs, Sun et Collins (2002) et c'est presque la seule étude que j'ai trouvée dans le corpus qui faisait référence à la valeur de consommation, ils ont étudié à Canton (Chine) la valeur de consommation des fruits importés. Ils se sont aperçus que dans un des 4 groupes qu'ils avaient segmenté suivant les réponses il y avait un groupe particulièrement où les éléments symboliques tels que le statut social qu'on voulait montrer, la notion de richesse, de réussite qui étaient associés aux fruits importés pouvait expliquer la consommation. Au niveau du lien social, je crois que pareil il n'y a pas beaucoup d'éléments mais en fait, l'apprentissage social revient souvent et il y a pas mal d'études qui montrent l'importance de la variable 'habitude' de manger beaucoup de F&L pendant l'enfance. Une étude polonaise notamment avait montré la famille comme facteur de préférence.

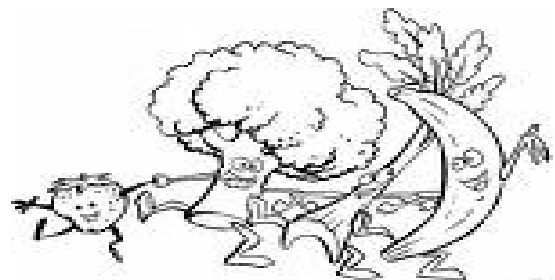
Et enfin, la valeur de partage et là c'est carrément absent, je ne l'ai pas trouvée dans le corpus je n'ai vu aucun élément qui pouvait référer à cette notion qui quand même fait appel à des notions de spiritualité par exemple. Parmi les populations étudiées, parce souvent quand même le corpus était composé d'évaluation programmes nutritionnels donc sur des populations spécifiques, souvent carencées en F&L et c'est souvent corrélé à un faible niveau culturel, un faible niveau de revenu etc. peut-être que tout simplement dans ces populations étudiées les F&L n'ont aucune valeur de partage. Puisque beaucoup de ces études sont d'origine anglo-saxonne ou américaine est-ce que c'est pour cette raison qu'il n'y a pas d'étude sur cette valeur de partage. Je m'interrogeais justement sur le fait que le développement de produits équitables qui sont soit des fruits comme la banane soit des compotes, jus de fruits etc. ou bien le développement de produits 'bio', est-ce que ça serait intéressant de voir si dans cette consommation là il y a cette dimension de valeur de partage, de spiritualité et serait plus évidentes.

Par contre, la valeur coût/sacrifice, là, elle est partout, c'est vraiment le facteur très prégnant dans les recherches. Je voudrais juste insister sur le fait que quand on parle dans cette notion de valeur de consommation, les coûts et les sacrifices ne sont pas

financés. Le prix intervient mais il y a aussi beaucoup à voir avec la praticité et la commodité et dans la plupart des études que j'ai vues cela arrivait même parfois avant le prix. C'est-à-dire que si on ne mange pas de légumes c'est parce qu'ils sont chers mais c'est aussi parce que ce n'est pas pratique à conserver par exemple. Le temps est souvent cité comme un facteur qui représente un coût, le savoir-faire et le fait qu'il y ait une faible connaissance des recherches. Il y quelques années j'étais au CIAL avec une directrice marketing donc bon niveau éducation, bon niveau revenu mais elle tombe en pamoison devant des choux-fleurs micro-ondable trouvant ça génial ; sur le paquet il est écrit que c'est dix minutes, dans la cocotte minute c'est le même temps et elle me répond qu'elle ne savait pas que cela se cuisait dans la cocotte minute. Donc quand on dit le savoir faire disparaît, c'est vrai. Il y aussi cette notion d'accessibilité qui nous, Français, ne nous parle pas trop mais cette hypothèse de désert alimentaire, d'après une étude américaine seulement 62% des supermarchés dans le Tennessee propose des F&L frais, des tomates et des pommes de terres seulement dans 30%. Donc là on peut vraiment parler de désert alimentaire.

Pour terminer, quelles implications tout ça peut avoir ? Je trouve que c'est intéressant d'avoir un cadre théorique qui permet de sortir du débat sur les prix. Après tout, si on dit que les F&L sont trop chers, on dit aussi aux producteurs de F&L que ce qu'ils produisent ne vaut pas grand-chose et qu'ils le vendent trop cher. Je trouve qu'il y a un travail à faire sur le fait que ça a une autre valeur que cette valeur d'échange. Travailler sur cette valeur d'usage, là, le challenge est fort puisque vous voyez bien que dans toutes les dimensions vues, il n'y en a pas beaucoup qui sont favorables à la consommation de F&L. Donc il y a du travail.

Ce que je peux proposer comme piste c'est probablement de comprendre la différence plus en profondeur entre la valeur hédonique des fruits et la valeur hédonique des légumes parce que très clairement ce n'est pas la même chose. Et puis il y a sûrement tout un travail aussi de différenciation entre les différents types de consommation de F&L à la maison, dehors, seul ou avec d'autres gens.



E VALESCHINI : Je voudrais faire le lien avec la notion de valeur partagée c'est une notion qui m'intéresse beaucoup parce que pour avoir fait une étude sur la consommation de poulet de par le monde et notamment en Europe, on voit par exemple qu'en France c'est un des pays où se maintient encore très fortement la consommation de poulet entier ce qui fonde le succès du poulet sous label rouge par exemple. En fait on voit que le succès du label rouge et du poulet entier va avec le fait qu'on le consomme de manière partagée par exemple le dimanche ou lors de fêtes c'est-à-dire qu'il y a des moments privilégiés où on mange et on goûte à ce type de produits. On voit très bien par exemple dans le cas du poulet qu'il y a un développement et croissance du poulet sous forme d'ingrédient, sous forme prédécoupé ou même d'ingrédient dans d'autres produits et il y a une grande croissance de ce genre de produits. Ce sont deux choses totalement différentes. Ma question pour faire le lien avec M Coulibaly est : « est-ce qu'au fond il n'y a pas à innover en matière de création de lieux de nouveaux partages ? » La question est : « est-ce que le commerce équitable ce n'est pas d'une certaine manière partager quelque chose avec d'autres gens ? »

Création de Valeur dans le Alliances de Marques - Cas du Commerce Équitable sur le Marché des Fruits

Mantiaba COULIBALY

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Ma thèse parle en fait de la création de la valeur dans les alliances de marques dans une dynamique inter-organisationnelle. Je parle de la création de valeur dans le sens marketing. Le consommateur qui va profiter du produit qui va être sur le marché mais derrière cette création de valeur pour le consommateur, les entreprises qui vont se mettre ensemble devront également créer de la valeur. Et comment est-ce qu'elle crée de la valeur à partir de dynamique inter-organisationnel ? Je travaille sur trois marchés différents : le marché du commerce équitable, le marché de la nutrition santé et celui des compléments alimentaires. On a différents types d'alliance de marques sur ces marchés là. Et comment la création de valeur va être différente d'un marché à l'autre ? Quelles sont les perspectives organisationnelles qui vont permettre de favoriser cette valeur là ? Ou encore quelles sont les limites à la création de valeur ? Et aujourd'hui donc, je vais vous présenter uniquement le cas qui porte sur l'alliance entre deux marques. Certains vont me dire que c'est un label mais quand on rentre dans la définition juridique de la marque le label Max Havelaar se positionne en tant que marque. Donc on aura le label « Max Havelaar » et une marque de banane sur un produit. Et derrière toute cette dynamique là comment les organisations vont arriver à mobiliser les mécanismes de contrôles, de certification pour pouvoir générer d'abord la valeur pour chaque entité en relation, pas seulement les deux organisations des marques, mais également les distributeurs, les producteurs qu'il y a autour pour ensuite pouvoir générer de la valeur au consommateur. Donc le consommateur ici, vient après. Avant le consommateur nous avons une entité globale.

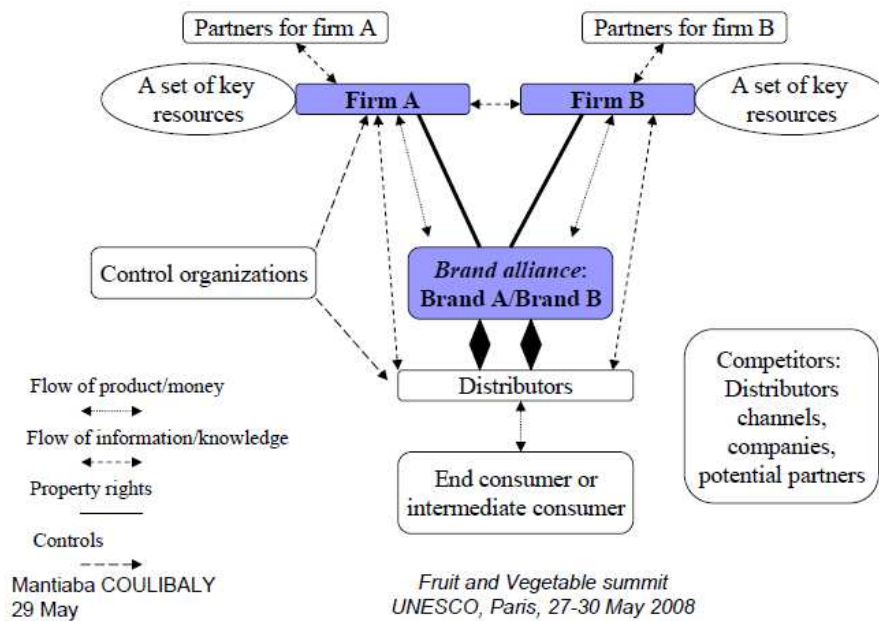
Je pars de l'explication de la valeur, donc la valeur a déjà été expliquée par mes collègues mais du point de vue marketing et la valeur dans un réseau. Pourquoi le réseau ? Le réseau parce que ce n'est pas seulement les deux organisations qui vont se mettre en relation mais ce sont les partenaires qu'il y a autour. Donc il y aura une combinaison d'activités, une combinaison de ressources pour pouvoir générer de la valeur. En partant de ces littératures sur les réseaux de valeur, j'explique que dans les alliances de marques, il y a des formes de réseaux qui naissent à partir de cette relation là entre les différentes entreprises. Je vous présente le cas de la banane Oké Fair Trade qui sont des bananes équitables vendus sur le marché et j'essaie de voir quelles sont les ressources qui sont mobilisées dans ce type d'alliance et quels sont les dynamiques organisationnelles qui permettent de créer de la valeur aussi bien pour les deux organisations propriétaires des marques que pour l'ensemble des partenaires qui se trouvent autour du réseau donc du noyau central.

La valeur donc d'une façon générale a été définie par pas mal de chercheurs comme étant cet avantage concurrentiel qu'on a par rapport aux autres. Comment est-ce

qu'on va délivrer un produit de qualité supérieure ou à un prix moindre par rapport à notre concurrent c'est ce qui représente la valeur pour le consommateur au départ. Derrière cette offre là et ce prix moins élevé il y a une relation entre des entreprises donc une relation « B to B » et également une relation « B to C ». Donc la valeur peut provenir également de cette relation là.

Et comment dans un réseau où deux entreprises ou plusieurs entreprises qui vont se mettre ensemble pour vendre un produit sur le marché va acquérir d'autres ressources ? Ce qui est même l'explication des relations d'alliances. Donc on va avoir d'autres ressources qui nous permettront de renforcer les ressources qu'on a déjà et pouvoir échanger des informations et également travailler sur des activités similaires. L'alliance de marques, la définition typique c'est : deux marques sur un produit ou encore l'alliance de marques dans le cadre par exemple d'une stratégie publicitaire, on va se mettre ensemble pour vendre un produit sur le marché mais dans le cas d'une publicité. Par exemple Air France qui est en collaboration avec les cartes Visa, donc ça veut dire que c'est une stratégie publicitaire, ils ne sont pas en alliance de marques où on va retrouver les deux marques sur un produit mais c'est dans le cas service qui va être délivré au consommateur. Derrière tout ça, il y a une interconnexion entre les entreprises, une interconnexion qui va au delà de la stratégie de communication marketing, au-delà de la stratégie de diffusion d'information ; les entreprises vont devoir mettre ensemble certaines ressources qui ne concernent pas uniquement le produit ou la marque donnée. Donc ces ressources là vont concerner la technologie utilisée, là on parle de ressources tangibles, ça peut être également des ressources intangibles comme le cas de la marque ou encore la notoriété qu'il y a derrière cette marque. Mais, les ressources, pour les utiliser et les mobiliser il faudrait qu'il y ait des mécanismes organisationnels derrière, que j'appelle ici mécanismes de gouvernance. La gouvernance inclut aussi bien le contrôle que le pilotage. Cela veut dire qu'elles sont les normes qu'on va mettre en place, quels sont les contrats qu'on va signer aussi bien entre nous qu'avec d'autres partenaires pour pouvoir délivrer ce produit de meilleure qualité sur le marché et quels sont les organismes de contrôle qu'il y aura autour. Sur le marché du commerce équitable on voit qu'il y a tout un réseau. Que c'est n'est pas uniquement Max Havelaar qui est en relation avec Agrofair mais c'est un réseau d'acteurs.

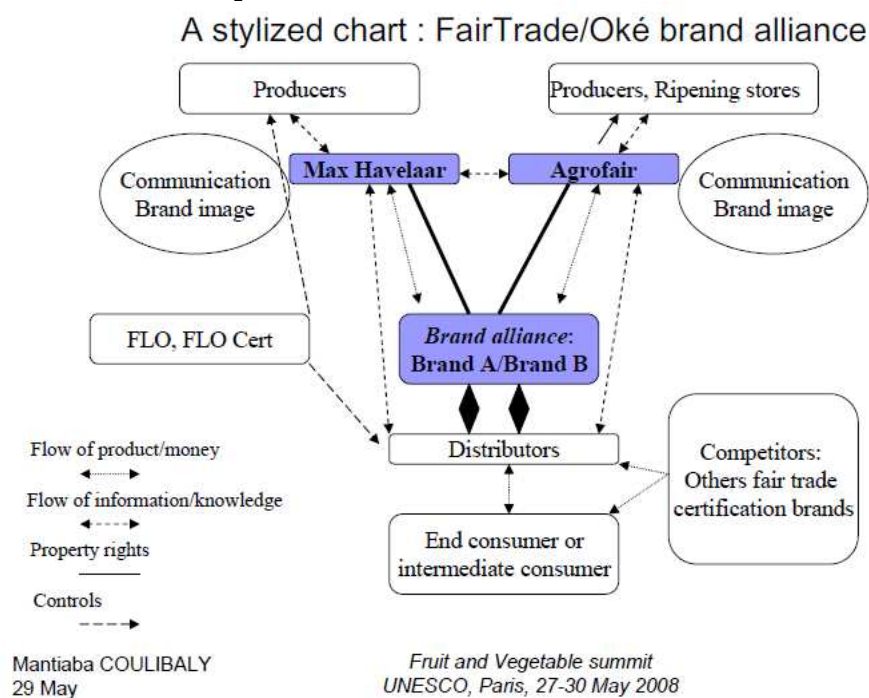
Chart: A network perspective on brand alliances



Dans mon modèle qui ne concerne pas seulement le marché équitable, je montre d'abord que le réseau concerne trois aspects bien particuliers : des ressources qui sont mobilisées, des mécanismes inter-organisationnels qui sont mis en place, et des acteurs qui vont devoir combiner ces ressources là pour créer de la valeur. Si je prends l'exemple d'une firme A qui se met en relation avec une firme B, ces deux firmes là vont devoir échanger des informations, des informations sur les produits ou sur la marque, des informations également financières. Mais à côté de ces informations là, ce sont des ressources qui vont être mobilisées. Ces ressources là vont être aussi bien des ressources tangibles que des ressources intangibles. C'est ce qui va donner naissance dans le cas de l'alliance de marques à la mise en commun des deux marques sur un produit ou dans le cas d'une stratégie publicitaire et ils vont donc échanger des contrats et il y aura des contrats soit qui seront formels ou informels. A côté de ces deux entreprises là ou de ces deux entités, on a des partenaires, donc des partenaires aussi bien la firme A que de la firme B. Cela veut dire que ces partenaires vont avoir également un impact sur le processus de création de valeur. Ces partenaires vont également combiner leurs ressources avec les deux entités. En gros les partenaires de la firme A vont être indirectement en relation avec les partenaires de la firme B puisque la firme A et B échangent des informations stratégiques sur l'alliance de marques. Et, sur le marché alimentaire, il y a les distributeurs qui vont devoir également échanger des informations et des connaissances avec les 2 entités. La particularité sur le marché alimentaire, comme on l'a dit : on a parlé de qualité, on a parlé du consommateur, derrière il faudrait qu'il y ait un contrôle. Il y a des organismes de contrôle qui influencent également la création de valeur. Comment ces organismes de contrôles là à travers des organismes

de certification vont devoir vérifier si effectivement le produit qui est délivré respecte les conditions de production, si les producteurs ont droit au prix minimum et ont droit également à certaines faveurs et pas seulement les distributeurs et les firmes qui sont en alliance. Ces mécanismes de contrôles vont avoir une influence dans l'alliance soit sur la firme A, celle qui est directement en contact avec le producteur. ; ensuite sur le producteur, pour pouvoir permettre au consommateur d'avoir une certaine assurance. Tout à l'heure mon collègue disait qu'on retrouvait sur l'étiquette qui coûte la moitié du prix parce qu'il y a une allégation derrière, cette allégation qui explique comment le produit a été fabriqué, quel est le processus de contrôle qu'il y a eu derrière permet donc de justifier ce prix. Mais jusqu'où faudrait-il justifier ce prix ? Est-ce qu'il faudrait justifier ce prix de 50%, de 80%, de 90% et est-ce que tous les acteurs arrivent donc à avoir une partie du bénéfice qui est partagé ? Mais à côté du réseau il peut y avoir également des concurrents qui peuvent directement vendre au consommateur final en justifiant également sur l'étiquette que le produit a des qualités. Donc jusqu'où le consommateur va comprendre l'information qui est véhiculée ? Est-ce qu'il faudrait croire uniquement ce qui est là-dessus ou est-ce qu'il faudrait que le consommateur ait une explication soit à la télévision, soit dans les revues ou dans les écoles sur les organismes de certification et qu'ils sachent ce qu'est un organisme de certification et ce que permet l'organisme de certification par rapport au produit qui est délivré sur le marché. Donc, dans l'exemple sur le marché du commerce équitable, la marque de certification c'est la marque 'FairTrade' de l'association 'Max Havelaar' et la marque de banane c'est la marque 'Oké' d'Agrofair. L'alliance entre les deux va donner naissance à 'Oké FairTrade' que le consommateur va retrouver sur le produit. Attention, sur ce produit là on voit écrit Max Havelaar en grand et 'Oké FairTrade' en tout petit, cela veut dire beaucoup de choses. On a une forme réseau où on a plusieurs acteurs qui sont en relation, nous avons Max Havelaar, AgroFair, FLO qui est un organisme de certification, les producteurs de bananes, les distributeurs, les mûrisseurs, et lorsque le consommateur achète le produit il se dit tient j'ai acheté un produit équitable, mais où est Agrofair dans cette relation là ? Est-ce une stratégie d'Agrofair le fait de permettre au consommateur de voir uniquement le symbole Max Havelaar puisqu'il connaît le symbole Max Havelaar et qui est un gage de sécurité et un gage de garantie où est-ce que cela n'est pas délibéré, l'information ne passe pas bien auprès niveau du consommateur ? Ce que je constate dans cette étude, parce que je travaille avec les différentes organisations et je compare également sur un autre marché pour voir si les résultats sont cohérents, c'est que les ressources qui sont mobilisées, la ressource principale c'est l'image de marque, l'image de marque à travers quoi ? ce produit qui est éthique, ce produit qui est censé être un gage de sécurité pour le consommateur. En mangeant des bananes équitables c'est comme si j'aidais le producteur qui se trouve au fond fin du Ghana. En mangeant des bananes équitables, c'est à dire que je mange des bananes de qualité où il n'y a pas d'intrants chimiques, des bananes qui respectent également des normes environnementales et aussi des normes sociales qui permettent aux producteurs de pouvoir subvenir à leurs besoins

de construire des écoles. Le consommateur ne mange pas forcément parce qu'il aime la banane, c'est parce qu'il se retrouve en fait dans une société donnée où on dit qu'il faudrait aider, dans une société où on dit par exemple qu'il faudrait consommer des fruits ou des légumes qui sont bien pour la santé. Donc la stratégie de communication tourne autour de ce respect là de l'environnement, du producteur et pour pouvoir la mettre en pratique qu'est ce qu'on fait, on dit qu'il y a un organisme de certification qui contrôle, il y a également les producteurs qui doivent respecter un cahier des charges, il y a un bénéfice qui est partagé entre les producteurs, les distributeurs et également le consommateur qui perçoit une valeur derrière, de satisfaction personnelle et de satisfaction humanitaire en se disant « je fais une action humanitaire ». Mais, derrière cette situation là il y a des redevances. Est-ce que ces redevances expliquent la raison pour laquelle on ne retrouve pas exactement le logo de la deuxième entreprise partenaire Agrofair sur le produit ? C'est-à-dire que même si on ne retrouve pas le logo, que ces bananes sont vendues parce qu'elles sont équitables, je paie quand même cette redevance qui me permettra de vendre autant de bananes et d'augmenter mon chiffre d'affaires. C'est la question que je me pose, je n'ai pas encore trouvé de réponse.



J'ai schématisé à partir de mon modèle de recherche les entreprises dans ce cadre là. Je retrouve bien Max Havelaar, Agrofair, la ressource clé que j'ai identifiée qui est l'image de marque et à côté de l'image de marque (brand image) il y a la communication marketing qu'il y a autour de ça, donc symbolisée notamment par la semaine du commerce équitable, l'information à la télévision, dans les magazines qui permettent de générer cette valeur là. Pour que cette valeur puisse durer dans le temps, qu'est ce qu'on fait ? On met en place une relation avec un organisme de contrôle qui permet de garantir cette crédibilité auprès du consommateur.

Qu'est-ce qu'implique cette recherche qui est en cours, qui n'est pas encore terminée ? C'est que la valeur de l'alliance de marques est liée aux ressources qui sont mobilisées. Les ressources ne sont pas uniquement physiques mais également des ressources intangibles, des ressources liées à la connaissance du produit sur le marché, des ressources liées également à la stratégie marketing, des ressources qui sont liées également aux routines organisationnelles donc aux relations qu'il y a entre les différents partenaires mais il faudrait inclure dans ce processus de création de valeur des contrats qui tiennent la route, des contrats qui permettent de respecter et de faire respecter également les règles de production et de commercialisation de la banane. Ensuite, ce qu'on peut imaginer pour que cette alliance puisse durer dans le temps, c'est de permettre une relation directe entre le producteur et le consommateur. Comment le consommateur peut-il arriver à croire dans le temps donc au bout de 10 ans, ou 20 ans que ces produits sont vraiment issus du commerce équitable ? Donc, il faudrait établir une relation même si nous sommes dans différents continents, une relation directe entre le consommateur et le producteur, comment établir cette relation ? Est-ce que le producteur ne doit pas participer aux prises des décisions concernant la mise en place des allégations nutritionnelles ? Est-ce que les producteurs ne doivent pas également participer à la relation avec le distributeur, qu'il n'y ait plus d'intermédiaire ? C'est vrai que le commerce équitable permet de réduire la ligne d'intermédiation mais il y a toujours le distributeur entre la personne qui achète le produit et la personne qui va vendre le produit au consommateur. Je vous laisse réfléchir là-dessus, j'y réfléchis en ce moment. Sur le marché de la nutrition santé j'ai également remarqué les mêmes choses.

E VALCESCHINI: Merci, on a hâte d'avoir des résultats sur l'autre domaine nutrition santé mais déjà ce que je trouve absolument remarquable dans le cas que vous avez étudié c'est que vous montrez comment pour attaquer un nouveau gisement de valeur qui tourne autour de ce que j'ai dit tout à l'heure des valeurs éthiques, environnementales etc. il fallait innover en matière d'organisation et là vous avez illustré en terme d'alliance. Il faut innover en matière de nouveaux types d'alliances et je trouve que c'est ça qui me semble très fort dans votre exposé c'est-à-dire que pour créer de la valeur, il ne suffit pas de faire de la publicité et d'utiliser de l'image de marque bien sûre vous le dites mais il faut aussi créer un design organisationnel. Et je trouve que par rapport au secteur des F&L dont on dit souvent qu'il a un degré d'organisation relativement faible, on ne s'interroge pas assez sur ce qu'on entend par degré d'organisation faible. Plutôt on pourrait dire la question autrement, est-ce qu'il suffirait d'avoir une organisation forte ? Je ne suis pas sûr. Il faut inventer d'autres formes, et le mot 'autres formes' doit être au pluriel, d'autres formes d'organisations et je crois que c'est ce que vous illustrez parfaitement bien. Et on va en discuter

Brand equity & co-branding in the fruit and vegetable sector

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This paper was done a couple of years ago and it is already published. If any of the presents are interested in more detailed results it is easy to have access to the paper through the Internet. My talk is highly related with the previous presentations; the topic is more or less the same: branding. The particular aim of my work is to analyse factors determining brand equity, focusing particularly on F&V. We used a “consumer approach”. This means that we have tried to measure the price premium: how much is the consumer ready to pay as an extra price for having a brand name in the product. It is exactly the same as in the Ezigio’s example about the bottle of water. So we measure in the price premium that gap between the branded bottle and unbranded bottle. We try to say that if the price premium is high it is because there is something intangible added to the physical product: the consumer is never stupid and he/she is not paying for anything. We argue that there is some kind of information or something that helps the consumer and deserves that extra price. What we have done is to explain what is behind the consumer’s rationality or brand owner’s behavior. We relate the price premium with different factors explaining how brand names reduce consumers’ contractual hazards.

We were also interested in co-branding as second aim. Co-branding is an emerging topic and we think it is interesting because many companies are doing it right now. Everybody knows the Visa example but also Intel Inside or Centrino in the laptop. The question is why? Some papers say that it makes no sense as it is inefficient to have two brands on the same product (co-branding) instead of only one. We support however the opposite idea. They are complements and they add more value to the consumer than if only one brand is added.

The theoretical part is based on transaction cost economics that is the main theoretical background of the paper. The argument is that in those exchanges in which the risk of opportunism is high (high transaction costs), brand equity should be larger. We are here measuring brand equity by the price premium. This suggests that the consumer buys safeguards for his/her exchange threats. When the potential problem is important (the risk of opportunism is high), the consumer looks (and pay) for the guarantees of the brand name.

The consumer problems we have considered are four.

The first one is the classical asymmetric information problem. We consider that we have two types of brands name targets. When the target of the brand name is the consumer, we think that the price premium will be higher than when the brand name is address toward the distributor. Why? Consumers are less expert than distributors. A distributor is buying tons of F&V every day; he is dealing with many different producers and sellers gathering lots of information about the F&V. They are then able to inspect the product and they do not need the help of brand name. However

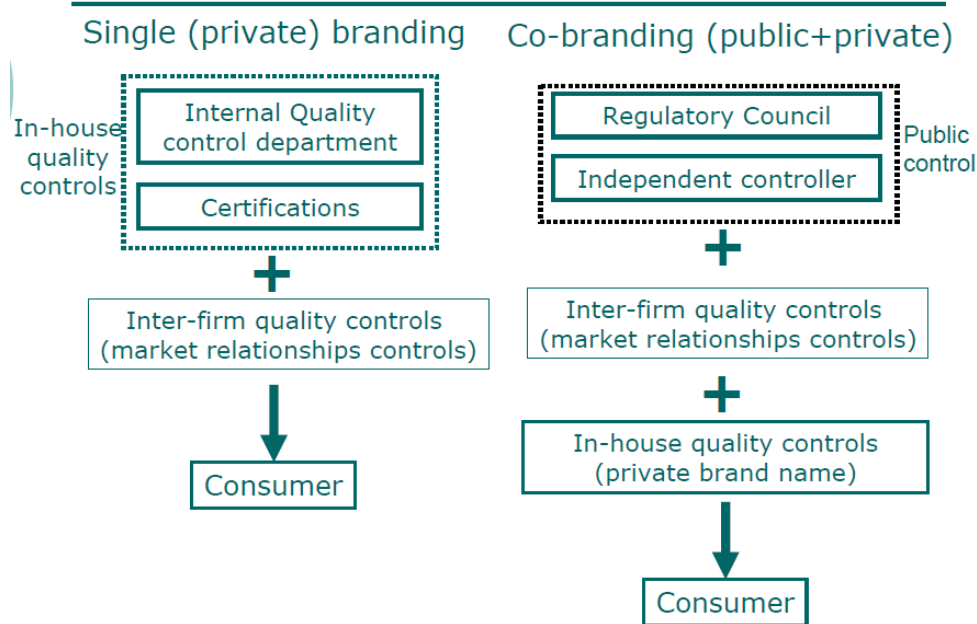
when a final consumer buy some kind of fruit or vegetable, he has not so much information and he is not interested (because it is too costly) in inspecting the product, taking a look to the competence products, etc. Given that consumers do not have accurate information about which units are the best, someone have to do it for them. Consumers trust the brand name and forget about all these things. Then, consumer-oriented brand names solve more problems than the distributor-oriented brand names and that is the reason why the price premium is higher in the first case (consumer-oriented brand names).

The second factor is the searching costs. We spend time shopping and we want to reduce that time but sometimes it is difficult because if we do not trust the retailer or the brand name we have to select the product because we need to test, to check if the product is satisfactory. Compare for example lentils versus apples. Can you imagine if you arrive to a supermarket and you start to select the lentils? It is impossible, the searching cost are very high. It is the opposite for apples. Given that it is very easy, consumers can inspect what they are buying (10, 12 apples). It takes time but not so much and an interested consumer can afford that time. So that is a reason because we are saying that brand related to products which yield high research or measurement costs are more valuable by the buyer. It is an important problem for consumers and they save more time in those kinds of products. That is the reason why they are ready to pay more a higher price premium in products with high search/measurement costs.

The third factor is the quality control. We think that quality control is important for the consumers because it guarantee a particular behavior or policy regarding the way a producer faces quality concerns. All brand names declare that they have some kind of internal quality control. However not all the brand names have additional and external quality controls. They setup independent quality controls hiring an external and independent company which controls inside their production facilities. That could be really important for the consumer because it would reduce the chance of opportunism. In-house quality controls, done by your own workers, allow the company modifying the intensity of the control depending on company situations, for example financial problems. Assume a ton of oranges that should not be sold, if the financial problems are important, the manager will try to look for another market, launch a special offer just to raise funds. Conversely, if the control is performed by an independent company, this behavior is much more difficult and the company probably has to destroy the oranges. The third factor argument is then that when the brand name quality control is performed by an external and independent controller, the buyer reliance on the brand name is greater and he/she is probably ready to pay more price-premium.

And the last factor is co-branding. The idea of co-branding in F&V is a bit different from the classical co-branding examples such as computers and credit cards. We usually have public and private brand coexisting.

Co-branding



What we have on the left in the slide is single branding, only one brand. The consumer perceives only one brand name on the product. All the internal quality control is done in-house (some external certifications of fulfilment of international norms are also possible). After that internal control, producers sell the product to distributor, retailers and there are additional quality controls each time the product change the hands: if Carrefour is buying some fruits to a local producer, it is going to control for the quality. In short, there are different levels of control: producer (in-house), distributors (market inspections) and consumer (preferences). When we have co-branding (right side of picture), this part is exactly the same but we have on the top of the value chain some kind of public brand name that reach the consumer. I will call "geographical indicators" to these public brands, referring to protected designations of origin (PDO) or protected geographical indicator (IGP) and other legal form, specific from each country. All of them work in a very similar way in Europe. The local government commands to control the inputs, the process etc. This means that there is an additional control from the consumer point of view and he/she perceives at least two different brand names. You can see "Zagora", an apple from Greece, and "Filippos", the name of the producer. Sometimes you can have until three brand names on the same product: the PDO, the producer and some kind of cooperative that is organising the packaging and all these things. Each brand communicates different information to the consumer so he/she has more information with 3 quality signals than with only 1. We argue that brand names are specialized and the public brand name is specialized in guaranteeing a minimum quality of the inputs (and origin) and the process. After that, within this huge range, each particular company is focusing in reducing heterogeneity and in offering the features that their costumers demand. Consequently, this specialization complement each

other and the idea is that co-branding should add more value to the product from the buyer's perspective than a single brand name.

Let me now explain the empirical study. It was very difficult to collect all the information from 7 different EU countries and 14 brand names F&V cases. It was done through a project that was supported by the European Union.

Cases and variables

Case Study	Produce	Country	Private brand names		Public brand
			Individual	Collective	Official brand
<i>Cassegain</i>	Canned and fresh vegetables	France	<input checked="" type="checkbox"/>		
<i>Saveol</i>	Tomatoes	France		<input checked="" type="checkbox"/>	
<i>Elbe-Obst</i>	Apples	Germany	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>Pfalzmarkt</i>	Vegetables	Germany		<input checked="" type="checkbox"/>	
<i>Kozani</i>	Saffron	Greece		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Zagora</i>	Apples	Greece		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Conerpo</i>	Fruits and vegetables	Italy		<input checked="" type="checkbox"/>	
<i>Melinda</i>	Apples	Italy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>Aromata*</i>	Tomatoes	The Netherlands		<input checked="" type="checkbox"/>	
<i>Qualitom*</i>	Tomatoes	The Netherlands	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>Asturian Bean</i>	Beans	Spain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Girona Apple</i>	Apples	Spain		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Castle</i>	Spinach	United Kingdom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>Mockbeggar</i>	Soft fruit	United Kingdom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Here are the names of the brands, two of them from the Netherlands are false (*) because questions of confidentiality of the information. You can see that we have considered three brand names: individual, collective and public brand. The square ticked means that according to the managers of the company they consider that the most awareness brand is the square ticked one. In some of them the public brand is more important than in the other cases like Girona Apple or in Asturian Bean and also in Kozani that is saffron. The empirical study measures the 4 factors previously mentioned. First, we have classified all brands in two categories of recipients: distributor and consumer. This information comes from the manager of the company and they say who the target of the brand name was.

For the searching costs it is exactly the same, the experts say that the costs substantially differ for example in peas, beans or lentils because of the perishability and size of those products. We have

Recipient	Case (brand name)
Distributor	<i>Saveol</i> <i>Elbe-Obst</i> <i>Pfalzmarkt</i> <i>Conerpo</i> <i>Aromata</i> <i>Qualitom</i> <i>Castle</i> <i>Mockbeggar</i>
Consumer	<i>Cassegain</i> <i>Kozani</i> <i>Zagora</i> <i>Melinda</i> <i>Asturian Bean</i> <i>Girona Apple</i>

Searching costs	Products
High	Saffron, spinach, soft fruit, peas and beans
Low	Apples and tomatoes

then classified all products in two different categories (high and low searching costs). For the quality control it is exactly the same, we have differentiated internal control, external control or both. Some of them have internal and external. Some of them do not have external at all.

We have tried to consider all these things and tried to present some kind of empirical analysis. There are no econometric results. This is an explorative study but I think it is interesting to show the figures.

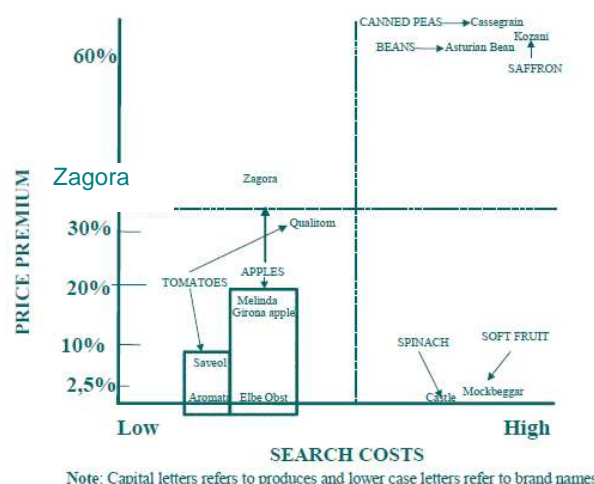
The way we measured the price-premium is just taken prices from the supermarkets. We considered three different prices in three different stores in one town and after that we calculated an average of the difference between branded price and unbranded price. In general all the products have some kind of price premium but we have 4 that do not have (Pfalzmarkt, Elbe-Obst, Aromata y Castle).

Quality control

- All brand names maintain internal quality control mechanisms
- Three brand names do not use external quality control mechanisms (*Zagora*, *Melinda y Conerpo*)
- Two brand name have an Inspection system which Independence Is dubious (*Kozani y Asturias Bean*)
- Remaining brand names keep both Internal and external quality control mechanisms.

Regarding the first factor, the asymmetric information problem, the result is very clear. We have performed a parametric mean test (because we only had 14 observations). You can also observe in the graph that the consumer-oriented brands obtain a much higher price premium than the distributor-oriented brand names. The recommendation in this preliminary study is that F&V firms should focus on these kinds of brand names. They have to forget the distributor-oriented brand names because they are not adding so much value as the consumer-oriented do.

The second result is in term of searching costs. The statistical test is not significant but the advantage of having cases is that we have a lot of information and you can explain why it is not significant. In this case it is *Zagora*, which is a Greek brand and who has made a very strong marketing effort. Although it is linked with apples and the searching costs are low, the value added by the brand name is very big. That marketing effort is the explanation. At the opposite you have *Mockbeggar* and *Castle* that have theoretically high searching cost (soft fruit and spinach respectively) but the price premium is very low.



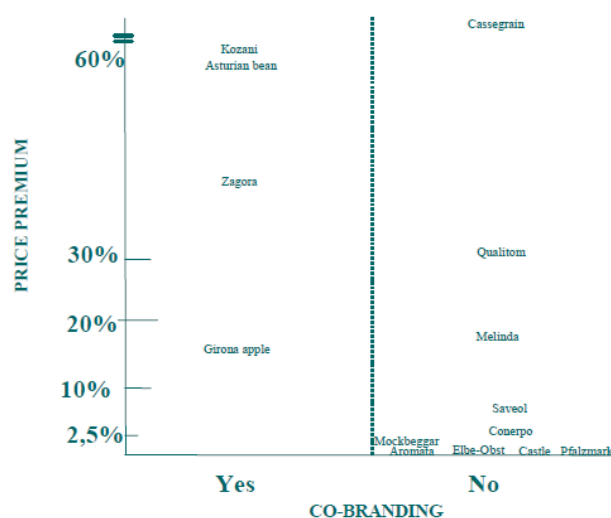
The reason is that they have distributor-oriented brand names. This means that we

R. Proposition	Average Price Premium	Mean test
P1	Consumer-oriented brands: 88.03% Distributor-oriented brand names: 7.44%	Mann-Whitney U = 4.000 Asymp. Sig. (two-tailed) = 0.009
Proposition	Average Price Premium	Mean test
P2	Brands with high searching costs: 90.8% Brands with low searching costs: 16.24%	Mann-Whitney U = 11.000 Asymp. Sig. (two-tailed) = 0.288

need multivariable regression techniques. We did not use them because we do not have enough information.

The quality control independence is not significant at all and we can not say anything about this because the spread of the cases is too much and the statistical test is of course not significant. We have something like Zagora for example that do not have any kind of external control but the price premium is very high. In comparison, Girona Apple is doing a very professional quality control with an independent company outside of the factory and the price premium is lower. So, at least, we do not have enough information to be conclusive.

For co-branding the statistical test is significant but there is some kind of exception that we have to take into account. The largest price premium comes for a French private company that is Cassegrain and this means that you do not need to have two different brands to obtain a high price-premium. There are two possibilities. If you are a big company you can invest a lot of money to develop an important brand name; but if you are a very small producer you do not have enough funds to do that. The best idea is then to use the platform or the support of the geographical denomination of origin because you can complement your brand



Proposition	Average Price Premium	Resultados del test
P4	With co-branding: 52.55% Without co-branding: 37.75%	Mann-Whitney U = 7.000 Asymp. Sig. (two-tailed) = 0.063

name with the PDO brand. This solution is very profitable in terms of value added.

In conclusion, we can consider the brand name as a tool for the consumer. It should solve problems to the consumer (asymmetric information problems). According to our results, this is ready to pay an over price when the brand name reduces his/her searching or measurement cost or when the brand is adding information, either because he/she hardly knows the product features or because they complement with other brand names in the product. In our case, the independence of the quality control is not statistically significant. We do not have a satisfactory explanation for this. One possibility is that the consumer does not care about who controls, probably because European regulation is strong and we trust the authorities in charge of that control.

The recommendation for F&V firms is that they should develop brands; it is interesting to develop brands because they add value. How to create this value? Brands should solve problems to the consumer and the four situations presented here could help to orient the F&V firms' efforts.

Q&A

PUBLIC (Christian HUTIN, du centre technique interprofessionnel des F&L) : Ma question s'adresse à E Valceschini. Vous nous avez bien décrit dans quelles conditions une stratégie de différenciation pouvait créer de la valeur. Je voudrais vous faire plancher si vous le permettez sur un exemple concret auquel je crois vous avez été assez associé qui est toute la réflexion qui a été menée sur la production intégrée et sur la possibilité de valoriser ce concept auprès du consommateur. Cela avait commencé avec les fruits mais il y a des démarches actuellement sur les légumes. L'expérience a montré que cela n'était pas du tout évident et ces projets ont été abandonnés. Est-ce que selon vous c'est parce que il y avait un vice de forme au départ dans l'idée même qu'on valorise ? Ou, est-ce qu'on n'a pas réuni les conditions qu'il fallait ? Je voudrais prolonger ma question sur une réflexion du même type sur ce qui est en train d'émerger maintenant qui est tout ce qui est communication autour de la réduction des coûts énergétiques. On sait par exemple que plusieurs enseignes de la grande distribution maintenant sont en train de vouloir communiquer sur les coûts énergétiques de leurs produits comme le coût carbone.

PUBLIC (Jean SALLE producteur de légume à Perpignan et Président de la Commission Accessibilité et Innovation à INTERFEL/APRIFEL et Président de VINIFLOR) : J'ai l'impression que concernant ces problèmes de valeur en général qui déborde de la création elle-même, qui en appelle à ça, j'ai l'impression que le vocabulaire courant est peut-être pauvre, c'est mon entendement. Pour savoir si on se limite à cette création de valeur ou si on ouvre un peu plus parce que quand on parle de valeur, il me semble avoir entendu les prix sont chers sans que cela soit une affirmation très forte mais cela passe très couramment tous les jours dans le vocabulaire. Sur les pages économiques du Figaro il est interpellant de voir que ce Sommet à l'UNESCO est situé de la manière suivante en première page des pages orange : « les F&L ont encore pris 5,5% d'augmentation » et en page intérieure on voit effectivement une désinfection du public pour les F&L. Au lieu de valoriser le sommet des F&L ce qui se dit c'est ça. Quand on ne sait pas dire sur les F&L on dit c'est cher parce que ça interpelle. Donc le vocabulaire est pauvre. Sur la valeur et la création ce qui m'interpelle c'est la captation de cette valeur de telle manière qu'on espère pour le futur, pour le progrès que la captation va être faite par le maillon qui la crée à l'instant où il la crée pour qu'il puisse y avoir une mécanique positive qui se mette en route. (...) Par ailleurs, il y a entre la connaissance réelle du sujet c'est cher/pas cher où je crée de la valeur, je la capte ou pas mais entre la réalité c'est cher/pas cher et la perception de cette réalité il y a un écart. Il y a une dissonance cognitive entre l'un et l'autre qui crée une réelle difficulté qui est aujourd'hui tout à fait d'actualité avec le pouvoir d'achat et qui est donc une problématique partagée entre tous mais notamment les hommes politiques. Aujourd'hui le souci actuel est de dire qu'il semblerait qu'il y ait une progression du pouvoir d'achat mais les individus, les administrés, les citoyens ont l'impression que leur pouvoir d'achat a

diminué. Comment traite-t-on de ce problème là ? J'aimerais que l'on réfléchisse sur la phénoménologie du prix que l'on traite et engage dans les discussions scientifiques sur la valeur alimentaire comparée des F&L par rapport au reste de l'alimentation. Ce qui m'interpelle c'est quand je vois la moitié de l'assiette qui est à 1,90€ pour la part des F&L selon le CREDOC ou SOFRES et on dit que c'est cher alors que la deuxième moitié vaut entre 10€ et 16€ et on ne parle pas du prix et de la valeur. Donc, on a une problématique : valeur alimentaire comparée, coût et valeur rétribuée à la production, prix consommateur comparé avec les autres aliments, avec d'autres services sociaux rendus entre la valeur attendue et la valeur réellement apportée, la nécessité de mettre en place pour débrouiller cette affaire là parce qu'il en va de la durabilité de nos métiers et de nos filières françaises, un débat parlementaire avec des organisations de consommateurs et mené par des scientifiques.

PUBLIC (Mariano WINOGRAD, Argentine) : Ceci est une question de réflexion pour Patricia Gurviez. Vous avez parlé de valeur d'usage comme contradiction avec la valeur d'échange, quelque chose que Monsieur Salle a souligné et je suis d'accord sur le besoin de valoriser cette valeur d'usage. Mais la question est sur la situation historique, géographique, politique. On peut dire la même chose pour la France et pour l'Argentine, on peut dire la même chose pour la France aujourd'hui que pour la France d'après guerre ou la France dans 20 ans. J'ai entendu avec quelques partenaires de ce Congrès que peut-être on arrive maintenant à une période de disette alimentaire et même dans les F&L parce qu'on a une relation entre les produits agricoles qui peuvent être utilisés comme biocombustible et le F&L parce que les terres peuvent être usées pour l'un ou pour l'autre. J'ai appris beaucoup de Monsieur Laborde, professeur du CTIFL et en Argentine en ce moment nous avons une discussion sur le prix des produits et leur valeur et le gouvernement nous répond avec une politique mercantiliste de fixer les prix pour être bon marché. La question que vous avez posée comme une question de gouvernement libérale alors que c'est la personne individuelle qui détermine ces valeurs d'usage mais c'est chez tout le monde aussi dans n'importe quelle période historico-politique, peut-on discuter sur cette chose.

PUBLIC (du CERAD) : J'aurai une question pour Patricia Gurviez. Vous avez balayé d'un tour de main le rôle de l'éducation et d'information en disant bon voilà. La première question est est-ce que vraiment vous assimilez l'éducation et l'information dans un même panier car je ne suis pas sûr que ce soit exactement la même chose. L'information c'est TF1 mais l'éducation ce n'est pas forcément TF1. Ensuite, à la fin de votre exposé vous avez mis l'accent sur l'importance des habitudes alimentaires des jeunes. Si cela n'est pas de l'éducation je ne sais pas ce que ça peut être parce que je pense qu'il y a quand même une place extrêmement importante pour l'éducation dans ce domaine.

PUBLIC (Manuel SIMON, Directeur de Cataluña Calidad, Organisation de Producteur de Catalogne) : J'ai une question et une réflexion. Il y a quelques mois nous avons fait une enquête de marché en Espagne dans 5 villes que j'ai constaté avec votre collègue français de PACA. On constaté que 60% de la population, des consommateurs ne connaît pas l'origine des fruits sauf aux Canaries où 80% connaissent bien l'origine des platano de ces Canaries. En Espagne on fait la différence entre platano et banane. La banane est celle qui vient de l'hémisphère Sud et le platano c'est espagnol. C'est une différence réelle. Ça fait quelques années qu'une stratégie de communication d'une agence de communication très importante en Espagne a appelé exclusivement platano le platano de las Canarias et la banane l'autre. Je crois qu'il y a beaucoup de travail à faire pour la question d'information du consommateur. Nous sommes derrière beaucoup de marques de qualité, AOC protégé, indications géographiques et nous sommes derrière la Poire de Lérída que vous connaissez, la '*Pera Lerida*'. Une question, vous avez parlé de stratégie de marques, de co-branding, je pense que c'est très important dans ce secteur d'avoir aussi ensemble une stratégie commerciale. L'exemple des Pommes de Girona qui n'est pas une stratégie commerciale ensemble mais une marque parapluie avec les marques différentes mais ils n'ont pas encore une stratégie commerciale ensemble. Le 'platano de Canarias' est une réussite brutale en Espagne mais ils n'ont pas encore une stratégie commerciale ensemble, une stratégie de prix et de distribution. Avec la Poire de Lérída on va essayer de le faire, faire une stratégie commerciale. Qu'en pensez-vous ?

J'en profite pour faire une petite réflexion sur la première question posée sur la production intégrée. Je crois et on a constaté avec des petites enquêtes que la production intégrée, le consommateur ne la comprend pas, c'est une parole très compliquée. Si on explique qu'il y a une production traditionnelle et une production écologique, le consommateur pense que la production intégrée c'est la moitié des phytosanitaires. Il ne comprend pas. Mais, on ne fait pas de communication sur la production intégrée mais avant de le faire je crois qu'il est très important d'uniformiser un projet commun européen de production intégrée avec AREFEL nous avons présenté à la Commission Européenne un projet qu'on avait fait de normes communes de production intégrée parce que ce n'est pas la même, la production raisonnable de la France, la production intégrée de l'Espagne que la production intégrée de l'Italie, c'est vraiment différent. Je crois donc qu'il est très important d'uniformiser la production intégrée dans l'Europe parce que ce sera la production du futur et la base des productions et après il faut la communiquer parce que le consommateur n'a pas l'idée de ce qu'est la production intégrée.

P GURVIEZ : Est-ce que je suis libérale ? Oui ! C'est-à-dire que je pense quand même qu'en haut du marché il y a le consommateur, c'est peut-être libéral. En revanche, je n'ai pas une image du consommateur comme un être individuel qui prend ses décisions tout seul que ce soit rationnel, je pense que le consommateur prend des décisions encadrées dans un modèle socioculturel et dans l'alimentaire c'est

vraiment encore plus fort. Je pense aussi que c'est une consommation extrêmement impliquante parce qu'à part les médicaments c'est la seule qu'on ingère donc ça nous fait quelque chose et on est vraiment en interaction avec cette alimentation. Vous avez raison de me prendre sur l'éducation, je veux dire simplement que l'éducation doit se faire de manière impliquante et je suis persuadée, et c'est pour ça que ça m'attriste d'un point de vue citoyen, de la perte de cette culture culinaire par ce que si les parents (...), si cela ne passe pas par l'éducation familiale, c'est perdu. Vous allez me dire quand c'est perdu, qu'est-ce qu'on fait ? Evidemment on peut faire des choses, je pense que l'école est une manière intéressante de les faire et c'est pour ça que les expériences dans le Nord sont intéressantes, en même temps, si cela devient quelque chose de trop rationnel, de trop scientifique, on perd tout l'intérêt parce qu'il faut que le gamin soit impliquée. C'est vrai que j'aime bien ces expériences où les gamins repartent avec des recettes de cuisine, il faut impliquer les gens. C'est moins spectaculaire que de faire de la pub avec des 4*3 mais honnêtement, je pense que l'argent public est mieux utilisé en faisant ça.

Après, valeur d'échange et valeur d'usage je pense que ce n'est pas contradictoire mais complémentaire. Les économistes ont raison, vous avez bien vu les coûts et sacrifices c'est ce qu'il y a de plus important. J'essaie toujours de voir par où on peut passer autrement parce que je me méfie un peu de la pensée unique et je suis d'accord avec vous le prix il n'y a pas que ça. Quand les étudiants me disent aussi que les marques alimentaires sont trop chères je leur demande combien ils ont payé leur portable. Fait extraordinaire c'est beaucoup plus cher mais ils n'ont pas l'impression de se faire avoir. Le prix est à analyser, j'ai bien aimé votre expression phénoménologie du prix, je la reprendrais, je vous citerais ne vous embêtez pas. Mais, bien sûr qu'il faut aller derrière le prix.

M GONZALEZ-DIAZ: Just one comment concerning the Girona Apple, the Platano des Las Canarias and the different. From my point of view, I think that the PDO offers enough tools to promote the brand name and I think it is not necessary anything else. The PDO can apply for local resource, public funds etc. I think that the PDO should do everything because it is a question of organisation inside the PDO. Sometimes it is difficult because it is something like a conflict of interest between the producer but the base of the PDO is a private company so I think the issues are organised by themselves and they should try to expands the brands, the PDO brand but always without the help of the local government, I do not like but it is a question of preferences.

M COULIBALY: Pour répondre à la question du collègue espagnol, pardon catalan ! (...) Vous avez parlé de solutions pour intégrer les stratégies commerciales et également la diffusion de l'information auprès du consommateur qui ne comprend pas grand chose parfois aux allégations. Je pense que c'est ce qui est en train d'être fait en ce moment sur le marché du commerce équitable parce que tous les acteurs ce sont mis ensemble pour communiquer sur ce concept là du commerce équitable. Je

ne sais pas si vous avez constaté avec les semaines qui sont organisées, la diffusion qui se fait à la télé, c'est une stratégie commerciale qui est en train d'être mise en place par les acteurs pour communiquer pas seulement sur la marque de commerce équitable qui est 'Fair Trade', il en existe d'autres, mais également sur les marques d'autres entreprises qui sont en alliance. Au niveau de la production intégrée et de l'information auprès du consommateur ce que je pense, et cela n'existe pas pour l'instant, c'est la question que j'ai posé à la fin de ma présentation c'est de pouvoir créer une plateforme où les producteurs pourront régulièrement ou éventuellement rencontrer les consommateurs et qu'il y aurait un échange qui ne se passerait pas uniquement par des intermédiaires, c'est vrai qu'on a réduit le nombre d'intermédiaire mais un échange qui permettrait d'avoir un crédibilité de l'information qui n'est pas forcément écrite mais également en face à face où à travers des conférences ou des colloques. C'est peut-être une chose qui est difficile aujourd'hui mais il faudrait y penser pour le consommateur et également revoir les allégations dont vous avez parlé.

E VALCESCHINI : Je voudrais faire un commentaire un peu plus général qui est une espèce d'autocritique. Je vous ai dit et cela a été dit tout le long des exposés qu'il y avait quand même un gisement de valeur autour d'un certain nombre de nouvelles valeurs qui ne sont pas des valeurs économiques mais qu'on pouvait essayer de transformer à travers des stratégies notamment des stratégies de qualité en valeur économique donc de l'environnement, de l'éthique etc. On a beaucoup discuté qu'autour de la meilleure compréhension aussi de l'attitude, de la perception des consommateurs il y avait de la valeur. C'est ça qu'on dit d'une certaine manière. Mieux comprendre le consommateur est une manière de créer de la valeur. Il est vrai qu'il y a des gisements de valeur important, il y en a une dont on n'a pas parlé spécifiquement à cette session mais dont on a beaucoup parlé lors du sommet et c'était déjà le cas du sommet précédent c'est tout ce qui concernait la santé et la nutrition. Il y a une valeur qui n'est pas strictement une valeur économique mais il y a une valeur sociale. Il y a évidemment une valeur financière autour des maladies etc. Donc on voit bien que ces nouveaux gisements de valeur existent. On a essayé de les identifier, il y a du grain à moudre mais ce que je voudrais mettre en évidence et mon autocritique commence là, c'est que la mise en évidence de ces gisements de valeur et notamment un travail stratégique de qualité, finalement, c'est à partir d'un outil qui n'a peut être plus lieu d'être qui était un outil qui consistait à analyser les stratégies de qualité dans un cadre où les prix agricoles étaient plutôt à la baisse, où les marchés étaient plutôt saturés, où on était plutôt en surplus d'offre et, en 6 mois, tout a changé. Vous disiez qu'on met en exergue ou on stigmatise l'augmentation des F&L mais que dire des céréales. Vous avez peut-être vu dans la presse la prévision de la FAO et de l'OCDE de 20% en moyenne pour les 10 prochaines années pour la viande par exemple etc. La question c'est est-ce que tout ce qu'on a dit autour de ces gisements de valeurs et les moyens et les leviers pour faire que ces gisements de

valeur deviennent de la valeur, crée de la valeur, est-ce que cela a encore une pertinence dans ce nouveau contexte de prix ? Personnellement cela m'interpelle beaucoup.

PUBLIC (Jean SALLE) : Ces extraordinaires évolutions que nous sommes en train de constater, on avait un peu imaginé, on savait qu'on allait manquer d'eau, on savait que le pétrole allait augmenter, on sait que le climat change. Cela a été dit mais personne ne croyait que cela allait être pour tout de suite, nous créer un environnement qui fait que nous allons devoir changer de paradigme. On est en plein dedans, c'est peut-être un peu trop tôt pour le dire sans doute mais ce qu'on a dit encore hier matin, ne sera plus vrai demain matin. Il faut que l'on soit très prudent pour assurer notre ressource dès aujourd'hui. Par exemple lorsqu'on fait une nouvelle loi de modernisation qui est quelque chose qui a du pouvoir parce que la manière dont on fait le commerce, la manière dont on valorise, la manière dont on va distribuer de la valeur va faire que demain il y aura ou pas de acteurs économiques ici et là. Prudence.

SESSION 22

PROMOTION OF F&V CONSUMPTION TARGETING DISADVANTAGED POPULATION IN DEVELOPING COUNTRIES (WHO/FAO)

Chair: **F Branca**

- Introduction. **GC Xuereb**
- School Policy Framework. **GC Xuereb**
- Food-Based Dietary Guidelines as an entry point for F&V promotion: regional perspective on promotion of F&V in the Caribbean context of Food-Based Dietary Guidelines. **PM Samuda**
- The WHO-FAO Fruit and Vegetables for Health Initiative: scope for regional and country interventions linked to ongoing initiatives - PROFEL, GLOBALHORT and Urban and Peri-urban Agriculture. **A Hodder**
- Fruit and Vegetable Consumption in Schools FAO's approach for promoting lifelong healthy eating habits. **E Muehlhoff**
- Improving health properties of fruits and vegetables. **Y Desjardins**

Introduction

Godfrey C. XUEREB

WHO, Department of Chronic Diseases and Health Promotion, Geneva, Switzerland

This is a session that has been facilitated by WHO and FAO. To give you all a brief background, for those of you who are not aware of the relationship, WHO and FAO have been collaborating on the area of diet nutrition and the prevention on chronic diseases since 2003 when we had an expert consultation jointly funded and jointly supported. The consultation report which is commonly known as TRS916 is entitled 'Diet Nutrition and Prevention of Chronic Diseases' and in this report we had the first recommendation about the benefits of F&V for the prevention of chronic diseases. The report recommended 400 grams of F&V per day. After that WHO and FAO launched the Joint F&V Promotion Initiative in November 2003 which was a result of the Expert Panel report and started the implementation of the recommendations. And then in September of 2003 we had the first joint workshop on F&V and health and this was held in Kobe and has taken on the name of the 'Kobe Framework on F&V initiatives'. So it naturally comes to play that we would be supporting an initiative such as the F&V Summit and this is one of the reasons why WHO is co-sponsor of the whole Summit and FAO is also supporting through technical operations.

With those opening remarks I will introduce the panel for today which is myself representing WHO and following my presentation will be Helen Muelhoff from FAO followed then by Pauline M. Samuda who is the nutrition educator at the Caribbean Food and Nutrition Institute and then Alison Hodder who will be speaking on behalf of a whole team from FAO, PROFEL, GLOBALHORT and to close the session we will have Yves Desjardins who will be talking about the ISHS Commission and the F&V initiatives they are doing.

School Policy Framework

Godfrey C. XUEREB

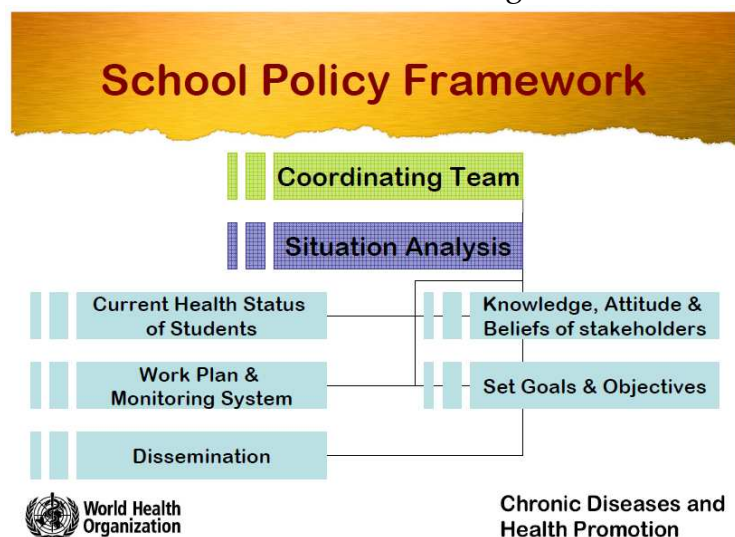
WHO, Department of Chronic Diseases and Health Promotion, Geneva, Switzerland

My presentation looks at the global strategy on diet, physical activity and health and particularly focusing on the School Policy Framework. As many of you know, WHO has a mandate from its World Health Assembly (WHA) which in May 2004 endorsed the global strategy? This global strategy has various initiatives one of which states that 'School policies and programmes should support the adoption of healthy diets and physical activity'. It also states that governments are encouraged to adopt policies that support healthy diets at school and limit the availability of products high in salt, sugar and fats but also that should consider, together with parents and responsible authorities, issuing contracts for school lunches to local growers in order to ensure a local market for healthy foods. With these mandates in mind, WHO has set out to create a School Policy Framework as we understood the importance of ensuring that developing countries and developed countries both have a framework which they can use in the development of their School Policies with special reference to the increase in F&V consumption by students? So what is the School Policy Framework?

Basically the School Policy Framework which we just have concluded is looking at the setting of a coordinating team. And this coordinating team should take the initiatives of creating a situation analysis. One has to find out what is the current situation such as the current health status of students, the knowledge, attitude and knowledge of the stakeholders

being the parents, the students, the teachers, the suppliers of food to the school. When these are evaluated, the coordinating team should set up a work plan and the monitoring system and in all the work that WHO has been doing in the recent years we have been including monitoring and evaluation as an important part of the work plan. It is important that any

project and any activity that is carried out, monitoring and evaluation is put into the initial component of the project because many times we find that if we leave monitoring and evaluation to the end either there is no budget for it or there is no time or there is no expertise and this important component is usually left undone. Then we need to set the goals and objectives and importantly we need to set a



dissemination policy. So this is basically what the framework is looking at. Looking at the situation analysis, from it developps a work plan and a monitoring system set objectives and goals. These goals and objectives need to be specific, measurable, achievable, realistic and within a specific time frame. This is how we propose that activities in this area should be planned. And then as I said before, a dissemination policy which should also form an integral part of the program. Now we are focusing on 3 major themes within the policy framework and these are mainly: the food services and programs, the school food program and the food availability near schools. And I will highlight these 3 briefly with ideas on how the framework proposes that they can be achieved.

In order to support and facilitate the adoption of healthy eating habits the program should be consistent with national or regional dietary guidelines. Some of the guidelines which have been used are for example the WHO-Euro 2006 standard which say that 'a nutritious diet should meet the nutrient and energy needs of students and be based on a variety of foods originating mainly from plant-based sources' with a variety of vegetables, fruits, whole cereals, bread, grains, pasta, rice or potatoes and preferably fresh F&V locally produced and if possible provided several times a day. The guidelines also talk about fat and especially the fact that trans-fatty-acids should be avoided and that the consumption of sugar and salt should be limited. Sugary drinks and sweets should be only used with limited frequency and the food should be prepared in a safe, hygienic and healthy way. The framework also suggests that we should use steaming, baking, boiling or microwaving in order to help to reduce the amount of added fat and avoiding fired food.

Now how do we implement? The framework suggests and gives various ideas on how this can be implemented and one of the things that we are trying to ensure in the framework is that these can be adopted by low and middle income countries and do not need a high level of development for them to be implemented. So for example we suggest that utilizing national food-based dietary guidelines and that where these are developed as national settings we try to develop those aimed at school children and develop nutrient standards for the food served in schools. In situations where no food-based dietary guidelines exist, regional guidelines can be used.

I said at the beginning that one of the major things that we look at in the framework is a dissemination strategy and it is very important that this dissemination strategy integrates all the key stakeholders. There should be different communication formats to school staff, to parents, to students because it is very important to involve them at a very early stage in the implementation. So how do we ensure the implementation then? Again, the framework gives various options. We as WHO very rarely mandate that things should be internationally legislated or have compulsory regulation so voluntary regulations are the main option that we usually suggest. However the

range of options goes all the way to legislation which determines which foods are appropriate and should be available in the school settings.

School-based programs should aim at increasing the availability of healthy food in schools and the framework also suggests various programs that can be undertaken ranging from breakfast programs, lunch programs and/or snacks at reduced price or in some situations free of charges e.g. the availability of free vegetables and free fruits in school children is some of the programs that are currently happening in Europe. Programs should be also universally available but again the framework suggests various economic models that can be used.

School Food Programmes

- School food programmes aim at increasing the availability of healthy food in schools.
- The programmes provide breakfast, lunch and/or snacks at reduced price or free of charge.
- Programmes may be universally available or eligibility may be determined by economic or health criteria.
- It is important to ensure that the meals provided are nutritionally adequate and in line with the nutritional standards of school food.



**Chronic Diseases and
Health Promotion**

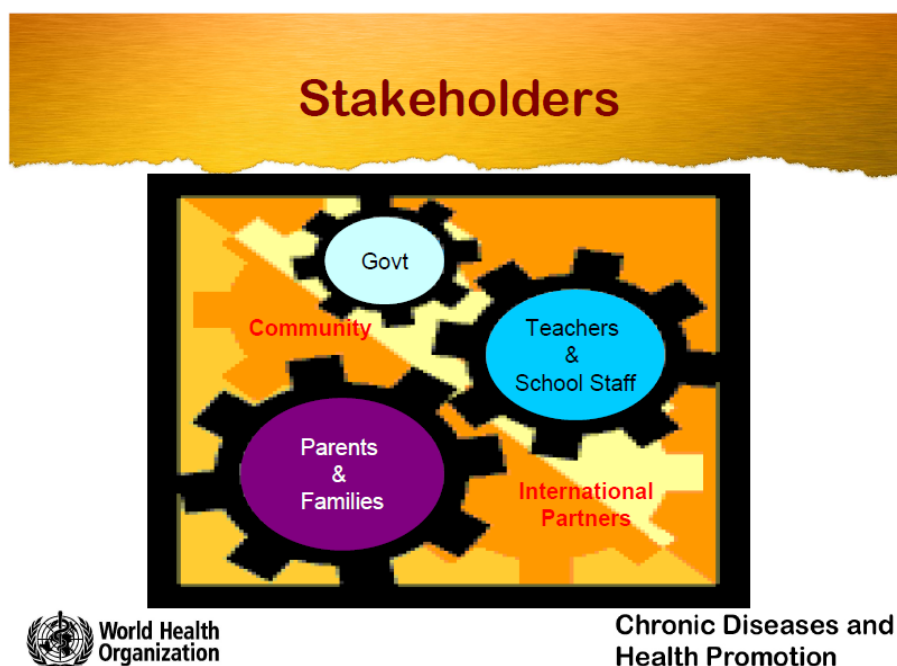
These range from using money that is generated through the program to supplemented or free food to children who are in lower social economic groups and other options that can be used. It is important to ensure that the foods provided are of adequate nutritional standards and that the school food model is a good example of nutritious food that can be provided to this age group. Another important aspect that is discussed in the framework is the idea of public/private partnerships and in many of the low or middle income countries we are seeing this public/private partnerships increasing. However we must insure that whenever there is public/private partnership the national nutritional standards are taken into account for the foremost priority for the partnerships. We are seeing many public/private partnerships coming especially in school settings and unfortunately many times the national nutritional standards are given as second or third priority as opposed to the advertising or the commercial aspect of the partnership. The framework also encourages the mobilization of local farmers and local food producers to provide

either low or subsidized price for F&V to be used in schools. One of the projects that FAO is actually involved in is the development of school gardens that can support the production of some of the F&V that can be used in the school based programs. Not only had we found that in schools where children actually produce the food they eventually eat them but there is also a better uptake by these children to choose F&V because they have been producing them themselves. The framework also looks at the issue of stigmatization of students who are on free or reduced meal programmes and this is an area where we have to be very conscious of the fact that stigmatization can be very easily produced if you have a dual system, i.e. if you have a system where children or students are buying their meals while others are being given free meals. Issues about a voucher system, prepaid system or other schemes have to be introduced and there needs to be a mechanism to ensure that stigmatization is avoided.

What do we do about food available near schools? Many of the discussion we had when we were developing the framework focused on the fact that we can regulate within the school boundary, but then what happens just outside the school boundary? This is something that many school authorities are worried about and admit that they have no control on. So who are your major stakeholders? And here we need to find who are the food vendors who are near, close to the school premises and include them in the planning, include them as a major stakeholder, include them in the whole strategy so that we can have a health-conducive environment so that the vendors know what are the plans, what are the ideas and why we are doing these changes and why we are adopting this strategy. In many countries and I can speak from experiences that I had especially in the Caribbean we found a high concentration of fast-food restaurants near schools. As you all know these fast-food restaurants hardly have any concentration of F&V for sale. Not only that they are actually selling food at a much reduced price, the dollar per calorie is very low and therefore there will be a very big competition to any school policy that is being adopted to try to improve and increase the F&V consumption within the school premises. So it is very important to have them on board, to have these fast-food restaurants as a stakeholder, as an important contributor to the all development of the policy. But, I reiterate what I said earlier on, we must insure that the nutritional standards and the nutritional policies that we want to push are the main priority. And we are not taken in by sponsorships, by support, by advertising especially from the fast-food restaurants. We need to ensure that we mobilize food and beverages producers, vendors and distributors to offer nutritious food choices around schools. Many times these vendors do not have the concept, do not have the ideas and therefore we need to be the ones producing the ideas. We need to be the ones who are forwarding the ideas that they can still make a profit, still make a living but, they need to recognize the importance of what we are trying to do in our strategies. So instead of having a vending machine with carbonated drinks we can have a vending machine with bottled water, with pure fruit juices, a vending machine that actually

have portions of fruit or vegetables. So the income from the vending machines for the schools, I remember discussing this with a school principal in the US saying he takes out the vending machines and he takes out the biology teacher because the profit from the vending machines are actually paying the salary of the biology teacher. But we are not saying to take out the vending machines we are just saying to replace the contents of the vending machines so that the vending machines profits can still be there but the options available to the students will be the healthy options. Disseminating the national food-based guidelines - we need to think outside the box. We need to think about various strategies that we can use to disseminate the food based dietary guidelines and not just to disseminate them to the media not only to the healthcare professionals but think about the F&V producers, the beverages producers, in many countries they can be local producers that are not part of the international companies, the vendors and the distributors who operate close to the schools. So these people need to be informed and educated on what we are trying to do with regards to these issues. Developing a regulatory mechanism is another idea that the strategies and the framework look at to develop a regulatory mechanism, voluntary or not, describing what foods and beverages are appropriate to sell not just in the schools but in the schools vicinities. So just as we have policies with regards to alcohol, tobacco which give measurements from where these can be sold “vis-à-vis” the school perimeters or age limits for alcohol for example. These can be ideas that may be on voluntary basis to start of and can also be applied to food sold in the schools vicinities.

Who are the stakeholders? The main 3 stakeholders we think about are usually: government, teachers and school staff, parent and their families.



But I propose another 2 key stakeholders and these are: international partners such as WHO and FAO and the community at large. Although they might be cogs in the background it is important that we use them and that we make sure that the whole of the system works together so that we get the best benefits out of all the strategies that are available and that can be produced for the benefit of our students.

In summary, schools are ideal environments to focus interventions designed to increase F&V intake. The results from various studies show that school-based schemes are efficient, effective at increasing both intake of and positive knowledge and attitudes of children towards F&V. Not only that, they disseminate into the whole setting when students learn about F&V and the importance of them is usually a take home message. Therefore the School Policy Framework Document can help Member States to implement such strategies.

Q&A

F BRANCA: This policy framework is very well accepted and particularly in the EU region there is an initiative which is becoming popular that is the Nutrition Plan School initiative. With this initiative we are trying to promote a whole school approach in which the provision of healthy food is becoming an important component. The characteristic is that there is a commitment from the stakeholders to actually implement strategy and there is recognition to the schools able to implement this policy that is available to everybody so that is perhaps a way to engage the different stakeholders to make sure that they follow these policies. As GC Xuereb was saying, we can not regulate everything. I think there should be a fair mixture of regulations and commitment but how to ensure the commitment.

PUBLIC (Tim LOBSTEIN): I want to congratulate WHO on moving forward and far in the last few years with old position with much more health education based and perhaps not very influencing on changing behaviour so this is very constructive move forward. I just have a technical point which is about you presented the situation analysis and how you must do monitoring as well as developing plans and the monitoring issue is interesting to me. Not so much on monitoring nutrition status, you can use measure with the vending machines and so on for the children but I am more interested in how you monitor school food offer, what is available in the schools and what need to be changed. I wonder if there was any tool the WHO is developing to help actually assess a schools food environment.

GC XUEREb: Very interesting question and the answer is that it is part of our planed strategy but we started off with the framework and we hope that as we go along and it is important to identify which are the tools that are needed before we will be adding the tools to the framework. One thing I did not mention is that the “Diet and Physical Activity” strategy has actually a tool box. If you go on the website there a

tool box of all the strategies we have been developing in the various areas of the strategy, this is a living document, we are adding as we go along. And one area we are looking at is focused on evaluation. We will be adding these tools as we go along.

PUBLIC (from France): I was attending a meeting in Houston on F&V and Health and there was a presentation of somebody working in the municipality of Houston showing that there was a receptivity differences between children from primary schools and children from secondary school. You are presenting F&V at school as a unique picture; do you think that there is a difference of more receptivity at primary school than secondary? Because, primary school children are accepting everything but at secondary school they are at an age where they are rejecting all the new ideas. So, do you think that there could be some difference in your strategy for your framework?

GC XUEREB: The framework does not go into that detail but indeed we are talking about two different types: learning behaviour and changing behaviour. In primary school it is a learning behaviour and in secondary school or high school it is a changing behaviour. So, in fact the strategies that are used would be different but I know colleagues like Pauline Samuda are doing some works with regards to infusing the use of F&V and healthy diet and physical activity into the curriculum. So there are strategies which make the students learn as they go along and sometimes subliminally without them knowing that they are actually learning about F&V because there are learning Maths, Biology and Science. So the strategy that is used and the framework just highlight some of these. The strategies used for the different age groups even sometimes for boys and girls might be different.

E MUELHOFF: I just comment on that. I believe there were data from the US that shows that teacher can actually have a very high impact on children's learning and attitudes and to some extent behaviours during the sort of very formative years from about 6 to 10 years old. But as far as teenagers are concerned, parents become very much more important so accordingly one should also have to change one's educational and behaviour change strategies.

Food-Based Dietary Guidelines as an entry point for Fruit & Vegetable (F&V) promotion: regional perspective on promotion of F&V in the Caribbean context of Food-Based Dietary Guidelines

Pauline M. SAMUDA

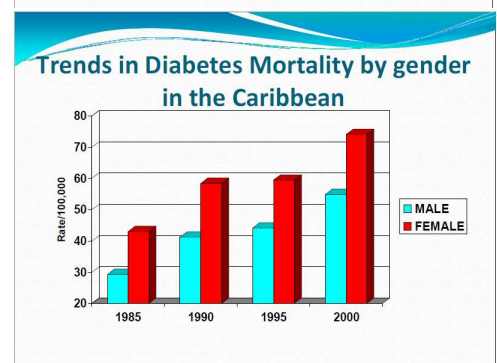
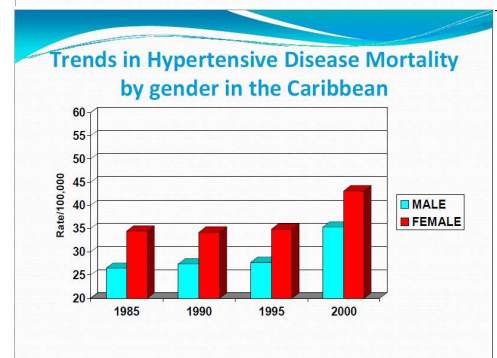
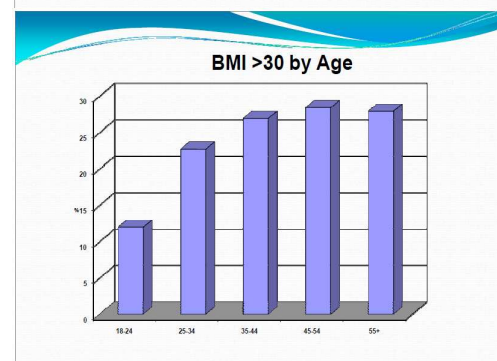
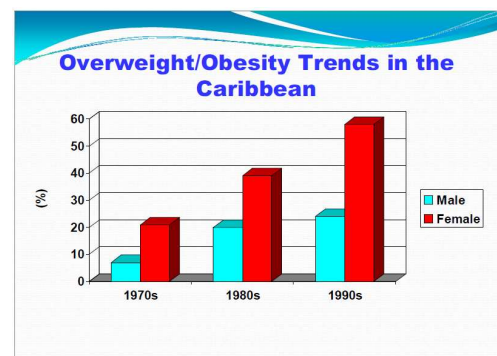
Caribbean food & nutrition institute, Jamaica

Firstly I am speaking from the Caribbean and would like to tell you where we are and then give you some context as to the health situation of the Caribbean, the development of Food-Based Dietary Guidelines (FBDG) and what is the F&V situation in the Caribbean and then moving right into using FBDG as an entry point to the promotion of F&V and finally making some suggestions for the way forward.

Where are we? We are in the English-speaking Caribbean where North, on the map, you see the bottom of the US (Florida) and to the South is South America. The Caribbean starts over by Belize, over by Mexico and comes all the way around to the small islands down to Guyana and Surinam (South America). Is the region comprises 18 countries and is bounded by both the Caribbean Sea and a part of the Atlantic sea. All that space has about 6 million people and my country Jamaica has almost half of that population. So they are very small states.

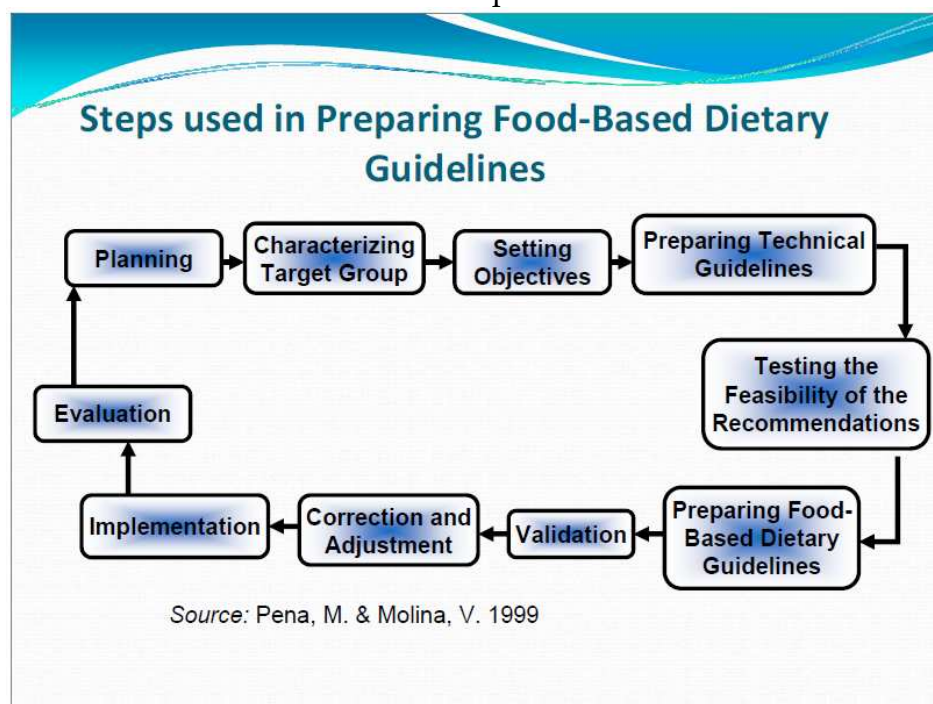
The health situation in the Caribbean is quite similar to what has been happening in a lot of developing countries where there is a transition from malnutrition and infectious disease to obesity and chronic diseases. There is a decrease in malnutrition and infectious diseases and similarly an increase in obesity and chronic disease.

The data are a bit old but the trend remains the same. There is an increase in each decade in obesity among males and females. As you notice, the females (in red) bear the burden of the obesity dilemma. As people age in the Caribbean, the BMI (body mass index) increases. So BMI increases with age until it peaks at 55 to 66. If we look at the trends in hypertensive disease mortality by gender



in the Caribbean we see the same trend where, if you look from the 1980s to the 2000s you notice that there is a continuous increase in mortality from hypertensive disease with females outstripping males. The trend for diabetes mortality is no different and very similar to hypertensive. Notice that the disease mortality trends follow the obesity trends.

Now looking at the development of FBDG in the Caribbean, the development process started with International Triggers for example the 1992 ICN declaration where the countries declared that they all promote healthy diets and lifestyles. And there was a 1996 World Food Summit where those delegates all also approved the Rome Declaration. Then there was a 2000 Millennium summit with the establishment of the Millennium Development Goals. Then there were Local Triggers such as the Health and Nutrition situation, the Nassau Declaration that was in the Bahamas where all the governments of the Caribbean declared that the health of the nation was a wealth of the nation so they were going to do something about the health of the nations. Then there was a Port of Spain Declaration which took place September 2007 where all heads of governments decided that chronic diseases was a real problem and as such they were going to do everything possible to work on the decreasing incidences of chronic diseases in the countries. So those were some of the Triggers that moved countries to the development of FBDG.



The process used in developing the FBDG was quite participatory and had several interactive steps. It is process which was developed and published by Pena and Molina (1999) who worked with PAHO so the steps were developed under the Pan American Health Organization umbrella. As you can see it was quite interactive. The partners that were involved in the development of the FBDG were international

partners which were FAO and WHO and PAHO through their agents in the Caribbean, the Caribbean Food and Nutrition Institute (CFNI) and the Institute of Nutrition of Central America and Panama (INCAP). FAO has been one of the major supporters of the development of FBDG in all regions. At a local level, the FBDG were developed by a multi-sectoral group which included government ministries as much as possible especially Health, Agriculture, Education, Planning, Trade & Commerce, Sports, social services as well as Academia, NGOs, Food Processors and the Media. The reason for ensuring that the FBDG were developed by these types of groups was to ensure national ownership. By the time you get to the stage of dissemination and implementation it will be owned by the different sectors. So there was a task force that was developed from the multi-sectoral group and this task force was ratified by the Cabinet which meant that each task force member was seen by the agency as having a lead role. The FBDG was not solely a ministry of health activity. Task force members were involved both in the development, the dissemination and the promotion of the FBDG.

The status of the FBDG in the Caribbean at the moment, countries are at different stages. So for example Antigua is just in the planning stage. Belize St. Kitts & Nevis are starting their development and the countries in the implementation means that they have finished the development and are now doing the implementation and promotion and they are: Commonwealth of Bahamas, Commonwealth of Dominica, Grenada, Guyana, Saint Lucia, St. Vincent and the Grenadines. We have not started impact Evaluation, however there is an evaluation and monitoring process as countries go through implementation.

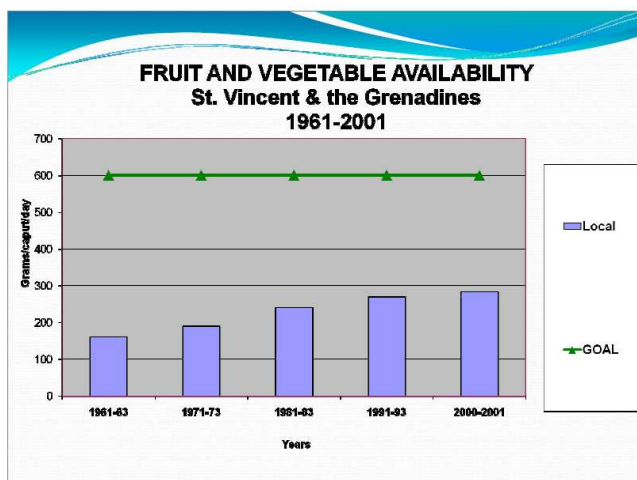
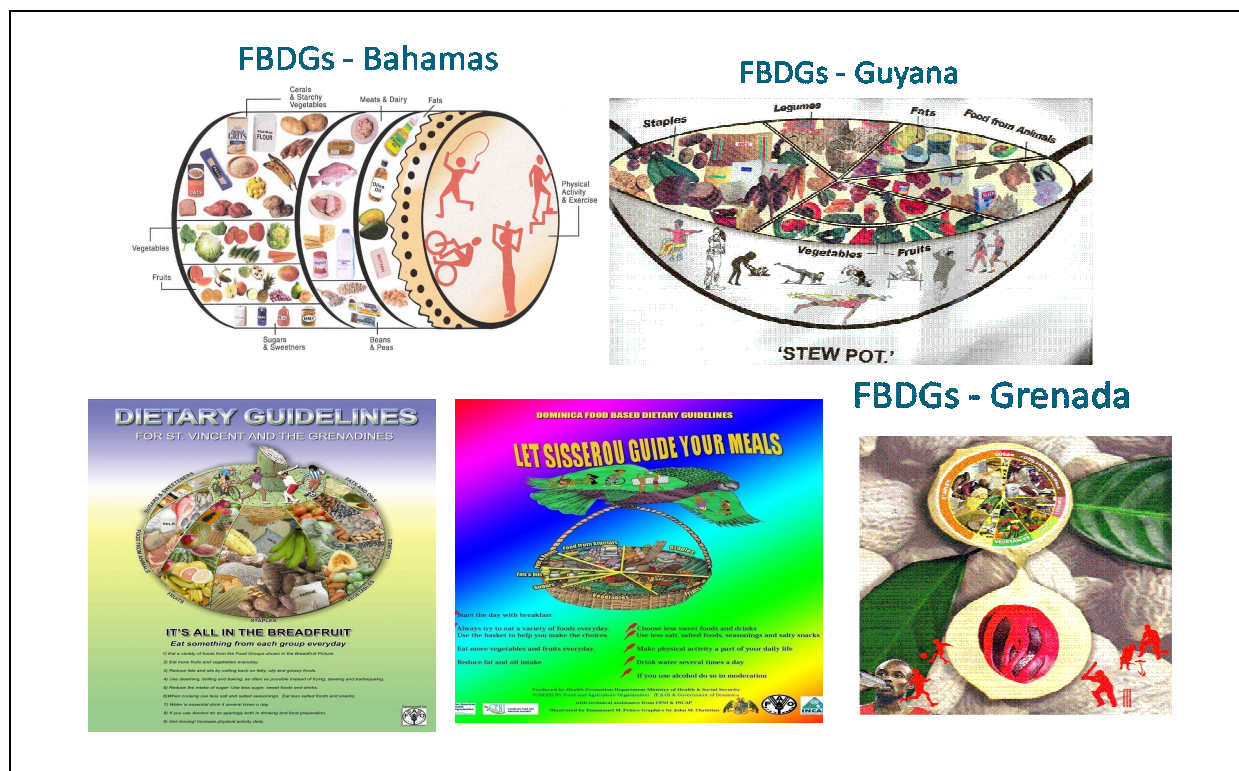
Because of similarities between nutritional and health situation as well as social and economic situation and communalities in our cultural practices there are lot of messages that are common across countries. The substance of the message is the same although the wording may be country specific. These are the common messages:

Message	Common-wealth of Bahamas	Common-wealth of Dominica	Grenada	Guyana	Saint Lucia	St. Vincent and the Grenadines
Eat a Variety of Foods	*	*	*	*	-	*
Eat more Vegetables Daily	*	*	*	*	*	*
Eat more Fruits Daily	*	*	*	*	*	*
Reduce Fat Intake	*	*	*	*	*	*
Reduce Salt Intake	*	*	*	*	*	*

Reduce Sugar Intake	*	*	*	*	-	*
Drink more Water	*	*	*	*	*	*
Use Alcohol Sparingly	*	*	*	*	*	*
Participate in Physical Activity Daily	*	*	*	*	*	*

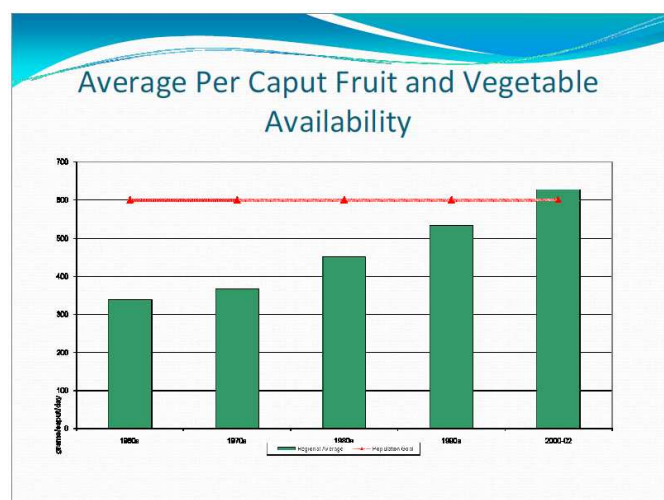
As you notice, we have recommendations on eating of F&V daily but note fruits and vegetables are two separate messages. A lot of time we talk about eating F&V and I will come back to that because there is confusion. So, we have two separate messages, one for vegetables and one for fruits. There is also the message on participating in physical activity daily.

There are pictorial representations of FBDG and this representation has 3 qualities. It must show proportionality and it must show variety and it must be culturally appropriate and this diagram is selected by the population. So we do a lot of population studies, using focus groups, Key Informant interviews and town meetings to get the thoughts and views of persons. Several diagrams are sent out to the population for testing. We send out maybe 6 and they select 3 which are then sent out in a second round and the one that is selected will be the one chosen. For example Bahamas has chosen the Drum because Junkanoo is part of their major culture and they figured that the Drum will represent them. I also want you to know that physical activity is in the picture as well and the decision was taken that although it is a FBDG, they wanted to include physical activity because they wanted people to know that just like eating, physical activity is a daily activity and both go together. In Guyana they choose the stew pot which comes from the Amerindians. Saint Lucia uses the Coal pot, that is part of the culture and again as I say the diagrams are selected by the population. Saint Vincent and the Grenadines uses the breadfruit, Dominica used the Carib basket with the Sisserou bird which is a national bird and Grenada which is called a spice island uses the nutmeg. So that gives you an idea of the development of the food based dietary guidelines in the Caribbean.

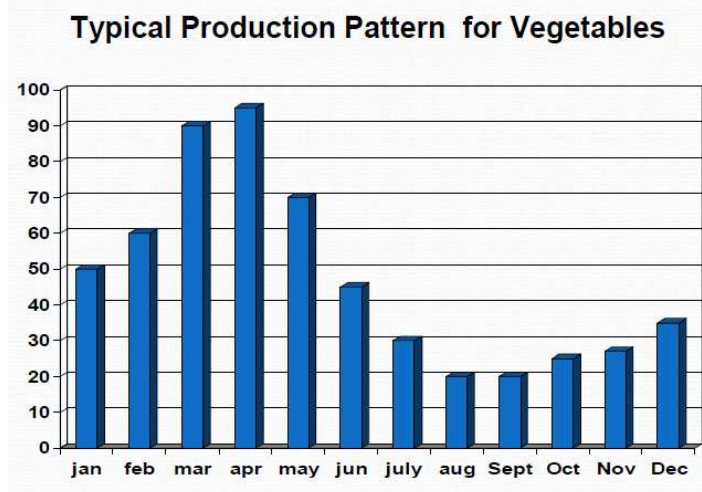


We have been talking in different sessions about the availability of F&V and the consumption patterns. So what is the situation in the Caribbean? This graph shows that 400 grams represent the availability of the average of the 18 countries, up to the early 1990's. The availability was just over 400 and in 2002 at about 600 grams but remember it is just availability, it is not consumption. But if we look for

example at one country like St. Vincent & the Grenadines we see that individual country can have a completely different picture. In St. Vincent & the Grenadines they are nowhere near the availability of the 400 of the 600 that is set for the regional level. A lot of countries do not have available per capita the required amount of F&V.



There is a problem of availability because of seasonality. This graph shows a typical production pattern of vegetables where we have most of the vegetables being produced in the early part of the year. March, April and May are the high times for producing F&V. September, August, and November are usually hurricane months and usually whatever F&V in the field are washed or blown away. By December we start the production again. So you see that we do not have a constant supply throughout the year.



CFNI did a 4-country study (2004) in Saint Kitts & Nevis, Trinidad & Tobago, Belize and Jamaica looking at the stage of change for F&V consumption. And I just wanted to show you that generally more people are in pre-contemplation and preparation stages than are in the action and maintenance stages.

Using that theory of behaviour what it is saying is that less than 40% of people are continually eating 5 servings of vegetables a day. A lot of people are in the pre-contemplation, thinking about it and some people are just preparing but we still have a long way to go to get a lot of the population eating 5 servings. I also want you to notice that the rural folks are more likely to be in the action stage in all countries than the urban folks and this more or less has to do with accessibility and the fact they are more likely to have back yard gardens in the rural areas.

Looking at the education level, what their behaviour was at the stage of change in relation to their education level, we found that the higher education, the higher the action stage. So, persons who are educated to tertiary level were more likely to be in the action and maintenance stages than persons who were educated to pre-secondary and primary. People who completed secondary were more in the action and maintenance than those who had not completed at primary. So these points outline that education has a role to play in how people consume F&V.

In the development of FBDG we also got some information through focus groups, key informant interviews and household trials. Before we finalized the FBDG we gave the recommendations out to the population for trials. "Could you do these recommendations for a week?" , "Could you eat 5 servings of F&V daily for a week?" We went to them with the recommendations and went back to find out how they were doing and came back at the end of the week to collect the information whether or not they were able to do it. We found out that certain barriers to consumption to

F&V were the costs; they did not have the money to buy the foods. Another is access meaning that they were not near to them, some people had the money but they could not go to get them. Availability/seasonality that we already saw, sometimes they were not available. Then, market quality was another problem with F&V, by the time they get to the market, the quality was not good so persons would not buy them. Taste was a major problem especially for vegetables that was a major barrier. Lack of agro-processing facilities in some areas where we had high levels of production, there was not a marketing system to move the F&V to other areas and there was also no processing facility to keep them for when there was no production. We also found that vegetables were mostly consumed on Sundays and Mondays. The reason for this is that persons went to market on Saturdays and as some people did not have refrigeration they bought the F&V to use for Sunday and what was left over was eaten on Monday. So these were the two days where you were sure to have vegetables in the diet.

For fruits, people were eating when in season so when mangos are in season, nobody cooks a meal, they just sit and eat mangos and then otherwise fruits were not seen as being a component of meal but just picked and eaten as a snack. So all the things we talk about the need to eat fruits with iron rich foods so that the mineral can be absorbed do not happen because persons do not eat the fruits along with a meal but instead as a snack. This is something that we have learnt and that we have to work with when we do the promotion and education.

Now why can we use FBDG as an entry point to the promotion of increased F&V consumption? In the Caribbean we feel it is very important because the FBDG is a government owned public education tool. The FBDG is not belonging to an agent. When FBDG is being launched in the country it is being launched by the highest person, usually the Governor General or the Prime Minister of the country. As it is government-owned it has a lot of authority. The other reason is that interdisciplinary and participatory nature of the development and dissemination process because a lot of regions are involved in the development and dissemination of the FBDG and it is a wide scoop for the promotion of F&V. Thirdly, while by themselves, not regulatory FBDG can impact the development of numerous diet/health regulations and policies. For example, FBDG can be the basis for policy development of F&V production, F&V import, F&V marketing and distribution, F&V pricing, for school feeding and for school vending.

I just want to tell you a few things that happened as a result of development of FBDG. For example in the Bahamas, as a result of the FBDG there was a removal of the sales tax on imported F&V because Bahamas does not produce much so more things are imported. When the FBDG were developed and promoted the government felt that if the population had to eat more F&V, one thing they could do was to remove the sales tax from those F&V which I think was a good thing to do. In Grenada as a result of the FBDG all snacks and lunches provided in Parliament,

government departments and government sponsored functions must contain fruits and vegetables. Previously they did not have any F&V. Of course now a lot of people go to meetings and complain bitterly because this is a regulation in Grenada. In St Vincent & the Grenadines there was a revision of Agricultural policies to expand the production of vegetables with the use of government subsidies. And the new thing they came up with is that all new housing scheme developments will have one fruit tree on each lot.

Now FBDG as an educational tool to increase F&V consumption: what we know is that consumers usually possess relatively good knowledge about 'healthy' or 'balanced' diets but lack practical knowledge to convert this into practice. And so the FBDG provide more specific and comprehensive advice because for each guideline in the promotion there are educational materials as promoting that particular guideline. So if the guideline says eat more F&V there is a whole set of material working on F&V. All guidelines are not promoted at the same time, they are promoted separately. As I said before, the guidelines also in promotion we do the creation of recipes as towards to add more F&V to the meal and we do recipe trials and once created they are used for displays or in television shows or in demonstrations. Display particularly has to do with proportions and servings because a problem we have when we say you should have 5 servings, nobody knows what a serving is. Usually when somebody says they had vegetables in Jamaica, they have a slice of tomato that when you thought it you can see Australia and they have a slice of cucumber and you see New Zealand and they say they had vegetables. But we have to teach them about what is a serving. Even in the nutrition community, the education community, we are not clear as to what is a serving and what a proportion is so, we have to work on that area.

We also have a problem of what is fruit and what is vegetable? We say eat more F&V so somebody says I do not like vegetables, I only like fruits so I am only going to have fruits. It is something we need to consider in our promotion of F&V. Is it that they should have one or the other? We know scientifically that it is not so but we keep saying eat more F&V, we need to do some education in that area. In the promotion of F&V using FBDG, in promoting FBDG there is a development of Communication plan where we have to look the different target groups and there are a wide range and to promote to each one separately we have to look at the different settings that can be used (e.g. schools, churches, worksites, markets, shops) and we have to look at the different channels that we can use (e.g. media, demonstration, displays, stickers, cartoons). Through a promotion of FBDG to these target groups, through these settings and channels we can also promote F&V consumption and so you can have: "F&V Day"- schools, "National Fruit Dish", increased street vending of fruits, F&V culinary competitions and F&V fest that are just some ideas for F&V promotion. We need to do some evaluations, periodic surveys, quantitative and qualitative to look at knowledge changes and awareness, at consumption patterns as the changing in behavior, the quantities being consumed. We also need to look at

country level and at local level at the availability of F&V also to monitor costs of F&V.

As a way forward I think there is a need for continued development of FDBGs in developing countries. From the experience of the Caribbean FAO has developed a manual as to the process of developing dietary guidelines. We need to do some capacity building in developing countries, there is a need to have communication and promotion strategies for reaching vulnerable groups and I think that is an area that is lacking so we need to build capacity and conscious for that. We need to do development and implementation of information systems. Then we need to have sharing of research findings, developed countries have the capacity to do research whereas developing countries do not have this capacity and so developed countries need to share research findings with developing countries. And then they need to do continued advocacy to governments as to role F&V in health and disease prevention.

F BRANCA: You have highlighted many uses of FBDG including the fact it can be a really good charter for agricultural policy.

The WHO-FAO Fruit and Vegetables for Health Initiative: scope for regional and country interventions linked to ongoing initiatives - PROFEL, GLOBALHORT and Urban and Peri-urban Agriculture

Alison HODDER

This presentation was conceived as a 3 voices presentation and you are only going to be hearing my voice by I am making the presentation also on behalf my colleagues Remi Kahane from the GLOBALHORT initiatives and Jacky Ganry from CIRAD.

What we wanted to do in simply reminding people on who are the disadvantaged people, how they are defined and how they feel in the context of global poverty has already been said as more than 850 million people are still undernourished in the world. More than one thousand million people are living on less than one dollar a day. Something that is very interesting and rather frightening is that although world's poor are today concentrated in rural areas, the balance of poverty is shifting fast towards urban areas and it is predicted that by 2020 more than half that is 60% of the world's population is expected to live in cities. So with more than half the world's poor becoming urban dwellers with very limited or no food production resources of their own, there are indeed urgent implications for urban food supply strategies.

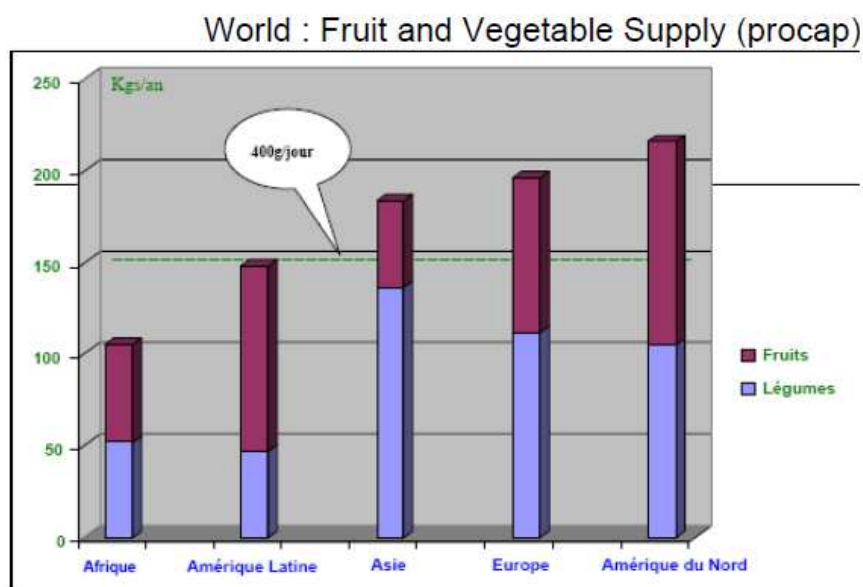
Now if we narrow this focus a little bit to the food insecurity situation in Africa we do not want to give the impression that all the developing countries are the same but there is an important need to focus on what we call the low income food deficit countries and that are still unfortunately a large number and largely in Africa. And 337 million Africans still consume less than 2100 kcal/day; 200 million Africans still suffer from chronic malnutrition; 5 million die of hunger each year; micronutrient deficiencies as we heard is still widespread. There are still millions of children underweight and suffering from stunting. More than 25 million Africans are living with HIV/AIDS. And along with all of those problems which persist, co-exists an increasing incidence, health problems, and non communicable diseases in particular which are caused by dietary imbalance-related over nutrition and obesity.

Fortunately for those who are aware of promoting F&V for health we are able to help them with simple, clear, science-based messages which today reflect the known health benefits of F&V consumption. We keep going back to that, 400g daily per capita intake of a variety of fruits and vegetables that is desirable within the context of a healthy, balanced diet; that is what we mean by a simple and clear message. Happily for us the recommendation for that F&V intake is equally relevant, whether we are talking about preventing malnutrition-related micronutrient deficiency or whether we are talking about preventing other kinds of non communicable diseases which are caused by dietary imbalance.

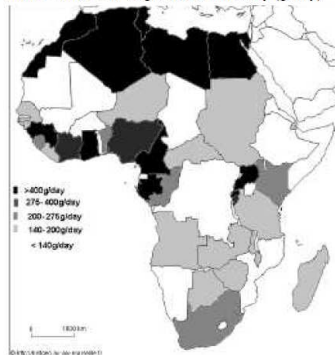
For planners to be able to appropriately target interventions they need good data. And we in FAO must be the first to admit that there is still a huge lack of adequate data about supply and consumption of F&V around the world. FAO can not do better than compile and broadcast the data which is provided to us by our member countries. We can, in a longer term, provide assistance to statisticians in our member countries to try to improve their approach. What we need to be extremely cautious about is making generalisation in the interpretation of the data that we do have. The figures, upon which we can map F&V supply and availability at national level, are at the very best vague and at the very worst unreliable. And they certainly do not tell us very much in most cases what is happening at local level, we only have national data, when the production and the availability and the supply is there. In addition to that very much of production and consumption, because many people in developing countries are still auto-provisioning or maximum of F&V is going through informal markets, much of that remains invisible in national supply data. These are typical data gaps that need to be filled. The last point I want to make here is simply to reiterate the point that was made very eloquently by Elio Riboli in his presentation but also by other speakers is that, we must not mistake supply for consumption, per capita consumption will always be lower than per capita supply because of wastage, lost during food preparation and so on.

Nonetheless having data is how the data is we can still make some use of it. The assumption that F&V consumption is too low in many developing countries is broadly backed up by global supply estimates and where these have been carried out it is backed up by local supply and consumption surveys.

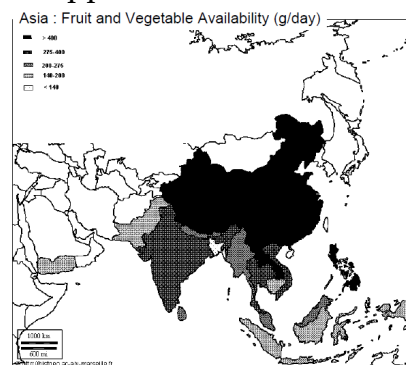
This graph gives us some regional aggregates of F&V supply and other speakers before me reviewed the 150 kg/year which correspond roughly to the 400 g/day that is the green bar. We would like to see all of those regions above the bar. Africa is below the bar, it looks like Latin America is touching the bar, it looks like Asia is doing quite well but behind that there are other stories.



Africa : Fruit and Vegetable Availability (g/day)



If we map what we know about national aggregates from African countries the situation appears to be even worse than we might originally thought. What we are looking for on that map is black. The black areas correspond to where there is an availability that would enable consumption of 400g/day at a national aggregate level. And in



Sub-Saharan Africa, if we do not include the North African countries we can see that there is not very much black at all and where there is black, that actually correspond to the banana and the consumption of banana as staple food is not exactly what we mean by 400g of F&V/day. So we need to watch those figures. In the first graph it looked like in aggregates Asia was doing ok but what we are actually seeing if we map it out for the whole region is that higher F&V today is in China. China having made gigantic strides forward in increasing its availability and supply of F&V is actually masking a scary situation in many of the other Asian countries if we only look at the regional aggregate data.

So characterizing and addressing the data gap is extremely important. Equally important is for planners and policy makers to have instruments to be able to understand current consumption patterns and to be able to know what are the causal and the motivational factors behind them in order to be able to orchestrate any national campaign promoting F&V. They also need to be in a position to know and allow for very different attitudes and perceptions to fruits and to vegetables consumption. These can be varying by gender; they certainly vary by region of the world. Just to give some examples in East Asia, fruit is very much regarded and behaved in the food economy as a luxury item; vegetable consumption is regarded as poor people foods in a number of African countries and you can hear in certain countries that children should not eat F&V below a certain age, it is not an uncommon recommendation if you listen to wild tribes. Addressing then supply and demand deficits simultaneously and through coordinated campaigns is really what needs to be done in most of the developing countries that we are looking at. Passed experiences of agency and organizations are showing unfortunately that simply leveraging supply without doing anything about trying to stimulate demand of F&V is only going to lead to unmarketable supplies of F&V.

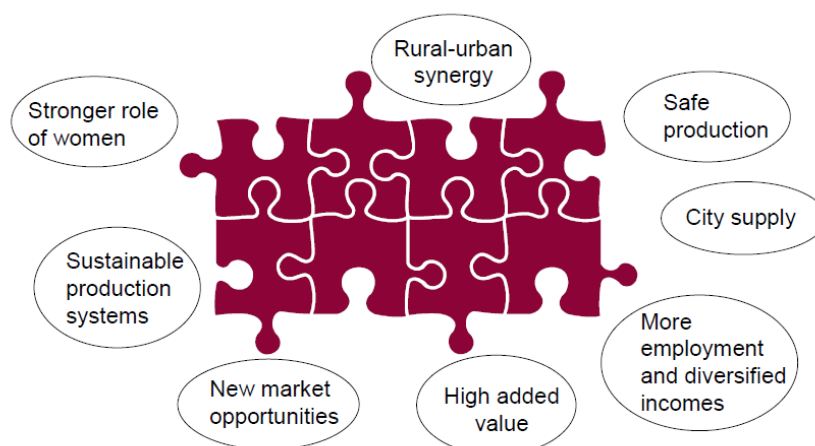
Now in terms of addressing that challenge of boosting consumption nutrition education is not a perfect tool, we have heard that over and over again. But, it is by and large the most immediately available tool that policy makers and planners have at their disposal in many developing countries. The point I want to make is that the

risk of F&V consumption actually dropping back in quantity and diversity is something that planners need to be continually vigilant for. This can be due to increasing organisation of populations, can be due to the nutrition transition which is accompanying economic transition in many countries around the world, can be due to increasing prices and in many instances can be due to unfortunately justified food safety fears, sometimes they are not justified but in many instances they are. So these are real risks and they need understood and addressed.

Looking then at the supply side we talk about fostering the development of competent and efficient F&V supply chains. In the development context, happily horticulture is increasingly coming to be regarded as an option and an opportunity for achieving higher value than subsistence agricultural crops and for being able to get the best added value. It has been regarded and more and more widely used as an effective driver of poverty alleviation interventions. One of the main areas for intervention and capacity building is in creating an enabling policy environment in countries for a competent horticulture said to be able to evolve. There is also with that increased supply pressure on supply a number of challenges that need to be address in order to ensure that special attention is given to food safety in all its aspects, you heard about the risk of pesticides abuse as the first food safety issue. We also need give as much importance if not more to the risks that are posed by micro contamination in vegetable production in the developing world as well. There is also a need to ensure that the production methods are safe for the operators and their families. So there is a need there for capacity building in areas as integrated pesticides management (IPM), good agricultural practice (GAP) and the owners in many developing countries on the farm the other supply chain actors to ensure that the quality of the produce is high enough because there are no regulations in mechanisms and if they are there they are not sufficiently effective to be able to give guarantees to consumers. It also important to ensure that improved access to F&V really benefits and targets the poor and not just the wealthy. It is important to ensure in the absence very often of effective environmental protection organisations that the natural resource base is preserved and protected. And, it is extremely important in the developing countries context to ensure that different kinds and sizes of supply chains or different links of supply chain are considered and by that we can mean the very short supply chain from the kitchen garden to the kitchen, we can be talking about informal urban and peri-urban short supply chains or rather more commercial and professional F&V supply chains. In many instances they co-exist in the same country and doing it address in capacity building and improvement. What in itself would also appeared to be an overwhelming complicated factor that policy makers on the agricultural side and the horticultural side and all of the stakeholders partners need to address. Happily there is to some extend helping hands and the fact that F&V production and marketing is rather complex and rather complicated and has many different stakeholders in and levels of organisations has meant that there has been a certain, in recent years, mobilization of international expertise which has also leverages of international assistance resources so that developing countries can get

some assistance in figuring out how to consider horticulture globally and in facilitating coordinated actions. And the GlobalHort initiative is a good example of that kind of approach to the problem.

GlobalHort is a Multifunctional Consortium ...



... considering horticulture GLOBALLY
...facilitating coordinated action

We thought it might important to share with you some events that took place under the FAO/WHO F&V for health initiative and what has been happening in regional level and what has been happening as a consequence at national level. Following the Kobe Workshop (...) we were very pleased to see as an almost immediate reaction Thailand put in place its one national program to promote F&V (PROFAV) and that was focusing on what could be done in schools with nutrition educations school meals and a well integrated and coordinated activities. I think that mirrored what Philip James was saying in his presentation about how hard Thailand has worked on poverty levitation and levitation of problems associated with poverty over very the recent years. Then, in the series of what we have been calling advocacy activities we organised a regional workshop in Asia in 2006 and following that the beginning of a pilot national interventions have come together in Vietnam (2006). Late last year in francophone Africa together with the consortium of organisations, it is not just FAO and WHO now there is other horticultural initiatives, CIRAD and also CTA that have got truly behind what we are calling PROFAV and PROFEL. Following the workshop that was happening in Yaoundé last year, national programs are now starting to take shape in Côte-d'Ivoire, in Cameroon and in Benin. The countries pilots that we are talking about are very much working progress but they all have different features and are being cast according to different interpretations of the KOBE framework. The KOBE framework was indeed drawn up in such a way that it provided a menu from which countries and stakeholders could pick and chose different kinds of interventions. But, what we can say is that those countries are doing 3 things that they have in common. One is building a multi-sector consultation

mechanism for F&V promotion where Agriculture-Health-Education, national agencies are involved together with private sector and civil society stakeholders. Another important aspect of the work is developing instruments to track supply and consumption in order to overcome those kinds of gaps in data availability that I mentioned earlier, in order to provide them with a baseline for the monitoring and evaluation and also to help them to more finely identify the particular groups at risk which should be targeted on a priority basis within their individual countries. And finally is designing integrated programs which are building on ongoing initiatives in horticulture also including peri-urban and urban horticulture, nutrition and public health.

Just as a series of reflexions that we may share with you about the difference between developed and transition countries environments and those which are faced in developing countries in the way in which they dictate original strategies for promotion increased F&V supply and consumption. Firstly if look at the commercial sector, very often but not always we see that there is a lack of specialised F&V supply chain/ inter-professional pick bodies and their absence or their lack of strength make industry-driven generic promotion an unlikely reality. It is important to keep in mind that although the market share of supermarkets in F&V marketing in many developing countries is growing; it is still limited. And the middlemen in many developing countries still play a major role and our extremely powerful economic actors in F&V marketing. What we do see in many developing countries is that generic agricultural producer associations if appropriately generated and supported can actually be effective partners even in the absence of the specialized F&V supply chain organizations. When we look at civil society, we can see that national health NGOs such as Heart, cancer and diabetes foundations although they are very often present, equally often they are not active or strong enough or able enough in fundraising to be able to at this stage provide meaningful partnership promoting the consumption of F&V. And if we look at the public sector, we can also be reminded that many other public health challenges such as HIV/AIDS, Malaria, poor sanitation etc. have simply higher profile and are simply absorbing more or the governments available resources than non communicable diseases and this is still especially the case in Africa. So that is a real challenge to be addressed. What we see next is that very often although it is not perfect, the strongest institutional actors for F&V promotion because they are there, they are present and they are present in the national statutory is still quite capillary as schools and health care centers. So perhaps with that I will launch a challenge hoping that there are some of these representatives or some of the developed countries, health NGOs or F&V supply chain organizations that fostering the development of lack organizations in developing countries even if development is not what you normally do is something that you will be very good at.

Fruit and Vegetable Consumption in Schools **FAO's approach for promoting lifelong healthy eating habits**

Ellen MUEHLHOFF

Nutrition and Consumer Protection Division, FAO, Rome, Italy

Overview

My presentation will look at FAO's approach for promoting good nutrition and dietary habits among children and youths with a focus on improved F&V consumption.

This presentation has three parts:

- 1) inform about FAO's approach and concept of nutrition education/promotion in schools;
- 2) share information and experiences from a pilot intervention in India concerned with the introduction of vegetables into the Mid-Day Meal Program;
- 3) draw some lessons and recommendations for broader policy and practice.

Nutrition Education in FAO

I would like to flag the main activities on which FAO's Nutrition Education and Consumer Awareness Group is working at present.

The first is food-based dietary guidelines which can serve as an educational and a policy tool. The second is a comprehensive effort to promote healthy nutrition among school-age children and youth, which is the subject of this presentation. The third involves activities to raise awareness about hunger and malnutrition and the "right to adequate food". An emerging area of work involves issues related to consumer protection and nutrition labeling to provide consumers with information about the nutritional content and healthfulness of foods.

Nutrition Challenges in Developing Countries

As the focus of this session is on developing countries, I would like to review the major food security and nutrition problems that we are still facing in the world today. There are still more than 800 million people who suffer from hunger and under-nutrition. The main nutritional problems affecting children in low-income countries are stunting, underweight and micronutrient malnutrition, including deficiencies of iron, iodine and vitamin A, zinc, folate and calcium. Children in many countries simply do not get enough good quality foods for an active and healthy life. At the same time, there is an emerging epidemic of obesity and related chronic diseases in countries that are currently undergoing a rapid 'Nutrition Transition'. The incidence of overweight and obesity among children and youth is increasing

rapidly due to poor dietary intake and lack of physical activity and type II diabetes is on the rise. Micronutrient malnutrition often persists. F&V consumption is very low and increased consumption can both address micronutrient malnutrition and contribute to the prevention of diet related non-communicable diseases.

What are some of the causes for this double burden? At the global level, we experience major changes in ways in which food is produced, marketed, procured and eaten. Urbanization has led to the loss of home gardens and traditional knowledge on how to produce, prepare and conserve food. Children who lose their families, as a result of AIDS in Southern Africa, for instance, do not only lose their parents' care but also their knowledge and experience of producing and preparing food. Children who have their own spending money are easy prey for advertisers.



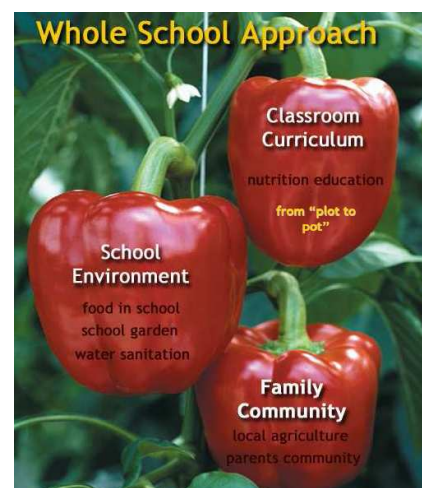
New commercial foods bought in supermarkets and expensive imported ones are often seen as “better” than traditional foods or home grown ones. F&V have a low image in some countries, especially indigenous ones. The result is poor diets and increasingly sedentary lifestyles. One of the answers to these problems, we believe, is education. Young people need information, education and skills to enable them to make good food choices and adopt healthy eating patterns.

Promoting Healthy Nutrition through Schools

FAO underlines the vital contribution that schools can make in countries' efforts to achieve food security and building a healthy society. Children are the current and future consumers and need relevant education to form lifelong healthy eating habits. Eating habits are learned early and schools can play an important role in promoting healthy and sustainable dietary patterns by engaging parents, teachers, food service personnel, food vendors, agricultural producers, processors and supermarkets.

Whole School Approach

This slide shows the FAO Guide on “Nutrition Education in Primary Schools”, which provides step-by-step guidance on how to develop a comprehensive nutrition education curriculum. FAO's curriculum concept extends to nutrition education the concept of ‘health promotion’. This assumes that health and diet are above all, a way of life, learned in all the contexts of a child's life. To be effective and have an impact on children's lives, nutrition education must tackle the



classroom, the school environment and the family and community.

An action, oriented, rather than a knowledge-based food and nutrition curriculum (“plot to pot”) can be linked to the school environment which offers ample scope for making healthy food choices and for learning practical skills, such as growing, harvesting, processing and preparing healthy food. Families and communities provide help in preparing/serving school lunches and running school gardens. Fresh F&V are procured from local agricultural producers and food suppliers. If effectively implemented, the “whole school” approach to promoting lifelong healthy eating habits has the potential to:

- equip children with nutrition knowledge and skills on how to produce, prepare, store, and eat F&V;
- promote healthy eating and improve children’s nutrition to the benefit of the whole family; enhance household nutrition, contributing to the mitigation of the health and social impact of micronutrient malnutrition and chronic disease;
- introduce innovations and techniques that children can take home and apply in their own gardens;
- raise demand for micronutrient-rich horticultural produce along with creating opportunities for farmers to increase and diversify F&V production for better incomes and rural livelihoods;
- forge linkages between the health and agriculture sectors as a foundation for food security and long term health (align the supply of food to schools with dietary recommendations).

Action Research: integrating vegetables into the India Mid-Day Meal programme (MDM)

I would now like to turn to a case study on a pilot intervention from India focusing on the introduction of vegetables into the Mid-Day Meal programme as a strategy for promoting dietary behaviour change. The case study highlights some challenges and constraints as well as some suggestions on the way forward. The pilot intervention was carried out by the Nutrition Foundation of India (NFI) with funds from solution exchange, an electronic forum for the food and nutrition security community in India, supported by FAO.

India Mid-Day Meal programme

The Mid-Day Meal program is a centrally sponsored program that was launched in 1995 and operates in Government run primary schools. In 2001, the MDM became a legal entitlement with the Supreme Court ruling that all school children in India have the right to receive a cooked noon meal. The Department of Primary Education revised the MDM guidelines in 2006 and stipulates that the MDM should consist of

100g of cereals, 20g of pulses and 50g of non tuber vegetables per day per child. If effectively implemented, the MDM can become a major tool for improving vegetable consumption among poor school age children in urban and rural India.

The rationale for introducing vegetables into the Mid-Day Deal meal program was as follows:

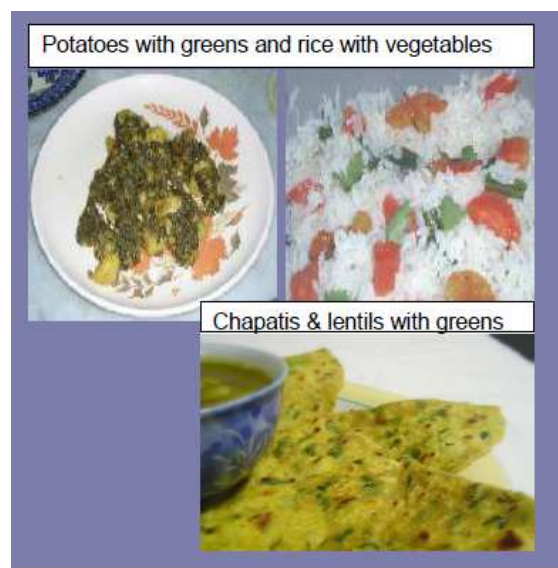
- high prevalence of micronutrient deficiencies is high in India;
- F&V consumption is low;
- rapid increase in NCD in urban areas;
- vegetables are inexpensive and good sources of micronutrients;
- vegetables contain phytochemicals and reduce the risk of NCD.

Some Challenges, which have delayed the implementation of the new school meal guidelines include diverging views on the relative merits of vegetables vs. dairy products and the popular perception that eggs and milk are more nutritious; food service providers were concerned that the costs for vegetables would soar during the summer season; also vegetables are perishable and need to be purchased daily; moreover, children do not like eating vegetables and funds for vegetables were not made available by the Municipal Corporation of Delhi (MCD).

The Action Research project on the introduction of vegetables into MDM was carried out from 2006 to 2007. The immediate objectives were:

- to assess the feasibility of introducing vegetables into MDM in New Delhi schools;
- to evaluate the effectiveness of linking school meals and classroom education for conveying messages about healthy eating and good nutrition;
- provide recommendations for policy implementation.

The first step was to identify a large scale vegetable supplier. “Mother Dairy”, a large-scale cooperative supplier, was willing to supply a variety of vegetables at the average cost of Rs. 10/kg. After initial preparatory work, efforts were made to encourage MCD to release the additional funds provided by central government to food service providers so that they could purchase vegetables and incorporate them into MDM. However, MCD had not received the funds. ISKCON (Indian Society for Krishna Consciousness), a food service provider with centralized kitchens, agreed to introduce vegetables in their MDM menus without requesting additional funds for the purchase of vegetables.



The next step was to demonstrate to food service providers how to introduce vegetables into the recipes. Six traditional rice or wheat-based recipes with pulses/lentils were being provided. Each of these was modified to include 50 grams of seasonal vegetables such as spinach, carrots, yellow pumpkin, cauliflower or cabbage. Earlier NFI studies had shown that children disliked green leafy vegetables and yellow pumpkin and removed pieces of these from their food. To prevent this, some vegetables were cooked, mashed and blended into the gravy.

Children and teachers from 3 test schools enjoyed eating them and did not find any difference in taste. Children relished eating tomatoes, potatoes, cauliflower, cabbage and peas; these were introduced as large well-defined pieces in colourful rice dishes – vegetable rice and vegetable pulao. By using different recipes in which vegetables were visible and invisible, it was possible to provide 50 grams of vegetables in MDM every day.

After initial testing, which showed that children accepted the recipes, production of vegetables dishes was scaled up to provide vegetables dishes to all 50,000 school children covered by ISKCON. ISKCON continued supplying vegetable dishes throughout the project period showing that the introduction of low cost nutritious vegetables in MDM is feasible and sustainable.

Nutrition Education

I now want to turn to the nutrition education component. 3 MCD schools were selected for Nutrition Education, where 36 teachers were trained. They were given 1 hour training on nutrition with 20 minutes on how to communicate nutrition messages effectively. Nutrition education material for teaching food and nutrition to school children were developed and tested. A variety of attractive depictions of F&V were developed and used as motivational tools. Nutrition education lessons were given daily, using MDM as the focal point for lessons, for six days. A pre- and post-test knowledge test was administered before classes were begun and within a week of completing the six days of nutrition education.

Results and conclusions about education impact

The results showed that children's knowledge increased substantially during the six days. However, further testing showed that children's knowledge declined over time.

What were the needs to ensure that children retained the knowledge? Clearly, reiteration of the messages over a longer period and more dedicated time for nutrition education in the classroom curriculum were need, in addition to the integration of messages in textbooks, which children could show to parents and

families; also more interaction with parents to assess the impact of the messages would have been desirable.

To conclude, nutrition knowledge alone is not an adequate educational target. And six lessons are clearly inadequate to embed knowledge or change attitudes and practices.

Lessons Learned from this Pilot Intervention

Some lessons learned from this pilot intervention are as follows:

- children accept and like vegetable-based dishes. However, prior testing for acceptability and palatability is key;
- cost related concerns were addressed by facilitating linkages between the food service provider and a large cooperative vegetable supplier;
- the Delhi supply chain, using large centralised kitchens, may be appropriate for urban areas; alternative solutions are needed for rural areas;
- local self-help efforts in different parts of India show that school farms and low-cost community green houses can supply vegetables to schools and add nutritional value to school meals;
- if adequate time is allocated and efforts are made to provide focused nutrition education, teachers can improve the nutrition knowledge of children.

In conclusion, the introduction of vegetables into MDM is feasible and sustainable, provided that adequate funds are allocated to facilitate regular procurement of vegetables from local food suppliers.

Some recommendations

In schools, there is a need to:

- raise awareness on the importance of healthy eating in the school community;
- create demand for local foods to ensure local agriculture benefits;
- train food service providers on the preparation of tasty vegetables dishes;
- promote school gardens, which are multi-functional: learning, food production, link with community;
- integrate nutrition education in the curriculum and create dedicated space for nutrition education to ensure sustainability.

In agriculture:

- encourage farmers to diversify/increase production of vegetables and fruit;
- facilitate linkages between producers/suppliers and schools to provide fresh produce;
- create an enabling environment to ensure small local farmers benefit; this is particularly important in a rapidly changing economic environment like India, where cooperative suppliers and small farmers may be pushed out of the

market by large retail companies that can offer better conditions to farmers that produce at scale.

At policy level:

- raise awareness among policy/decision makers on the importance of fruits and vegetables as part of a healthy diet;
- establish national standards for school meals;
- ensure an adequate budget.

Among the public: social marketing involving the media to raise the image of F&V.

Improving health properties of fruits and vegetables

Yves DESJARDINS

ISHS Commission Fruits and Vegetables and Health, Laval University, Québec, Canada

I think that at this stage there is a gap of knowledge with respects to production systems and of horticultural goods and how they can improve the health of people in developing countries. It is my contention that ISHS could be a bridge to bring new knowledge and the field of health effects of F&V and the components that are found that have favourable health effects.

I am going to go briefly over some of the pictures that we have seen throughout this conference. We see that there is a difference between developed and developing countries in terms of the role of F&V in preventing and improving health. We come with the idea that we need to have a healthy lifestyle as the mean of reduce health diseases that means ... exercise but it mostly points down that we must improve nutrition to reduce some of those chronic diseases like heart disease, diabetes and cancer. We had an interesting conversation yesterday saying that if we would adopt healthier lifestyles and mostly nutrition, we could probably improve the life expectancy of the population by more than 14 years which is a goal. And the actions that have been implemented to decrease chronic diseases to improve nutrition and this all conference have been to promote F&V consumption with programs to do this promotion around the world.

But, right now, I think we must ask the question why to consume F&V as finality. We have seen through the discussions the nutritional guidelines that are this stage we are promoting the consumption of F&V for their fibre content, vitamins and mineral content and these components have been included in the dietary guidelines to improve the health of the population. But, I think that there is much more to F&V that very often have been taken for granted during this conference that are the bioactive compounds, some of them are mostly antioxidants but you can find some bioactive molecules in crucifers like glucosinates, thiocyanates, indoles you find flavanoids and phenolic compounds, you find sulfur compounds in alliums, a lot of carotenoids in all leafy vegetables and carrots, lycopene and many other compounds that have a benefit to health. And unfortunately at this stage we are not able to characterize the content and promote in the dietary guidelines the use of these bioactive compounds as means of reducing chronic diseases and there are still a lot of debate in sciences as to the benefits of these compounds.

This is a brief table showing that all the compounds I have just described can treat illnesses like cancer, they have antimicrobial, anti-inflammatory properties, they can immunize stimulate, they can reduce blood pressure an all cardiovascular diseases so we need to better characterize the function of these chemical toward health and in particular the role of polyphenols.

There has been tremendous

Phytochemical compounds with potential therapeutical action

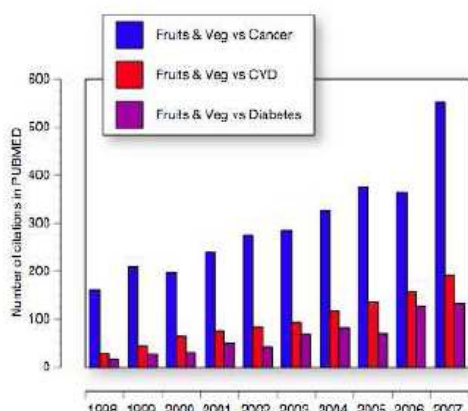
	A	B	C	D	E	F	G	H	I	J
Carotenoids	X		X		X					
Phytosterins	X							X		
Saponins	X	X			X			X		
Glucosinolates	X	X						X		
Polyphenols	X	X	X	X	X	X	X		X	
Protease-Inhibitors	X		X						X	
Terpenes	X									
Phytoestrogens	X		X							
Sulphides	X	X	X	X	X	X	X	X		X
Phytic acid	X		X		X			X	X	

A= anticancer
B= antimicrobial
C= antioxidant
D= antithrombotic
E= Immunostimulation

F= anti-inflammatory
G= Blood pressure regulation
H= Lowering cholesterol level
I= Blood glucose regulation
J= improvement of digestion

Schreiner, 2005

FAV / health research



interest from the scientific community in the last ten years to the role of those phytochemicals toward health and improving the health of the population. Just as an example, a little survey I did looking at PubMed quotation on F&V and cancer in 2007 there was more than 500 papers developing on the role of anticancer properties of F&V and if you look at the red bar it is cardiovascular diseases and diabetes. So you see that there are a lot of publications on these topics. If you look at the role of antioxidants, health is even more important, there has been 11,000 published

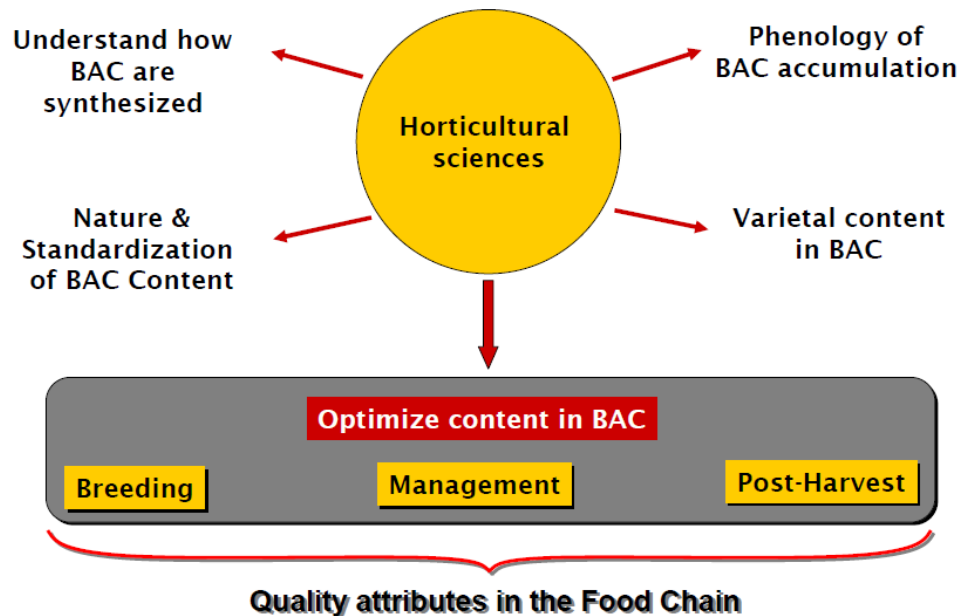
in the last 10 years on the role of antioxidants which are mostly coming from F&V on health. So there is tremendous amount of information in the literature. Unfortunately, at this stage most of the information is coming from in vitro studies and there is a lack of data on human clinical trials and epidemiological facts to prove the functionality of these compounds in F&V.

We have seen in session 6 on the effect of F&V on cancer that there were still a lot of debates on some of the constituents of F&V toward prevention of cancer. There are some epidemiological studies showing that there is some unequivocal effects SU.VI.MAX. study is a good example on the role of vitamins E and C on prevention and the incidence on some types of cancer but the recent epidemiological studies are showing that there is puzzling effects. There are either no effects or in some cases there has been opposite effects in increasing incidence of some types of cancers. So there is still a lot of debate on the role of F&V in the area of health science and there

are still a lot of challenges to explain the discrepancy in some of the results we are observing toward the health effects of F&V.

Some of the medical science challenges that we need to understand are that we need to have a clear understanding of the mode of action of the components that we find in F&V and that is we do not have yet. What are the bioactive compounds in the F&V and are they bioavailable? There is a lot of data now coming that they do not have to be ingested and bioavailable to have their beneficial effect, just the effects in the gut are sufficient to provide some beneficial health effects. What are the roles of antioxidants in oxidation network in the organisms? That is something that we do not know yet. And we have to know if the bioactive molecules are reaching their targets and sometimes they can even be toxic. We have been talking a lot about flavanoids and carotene but carotene can form some quinine sp that could explain the reason why we have discrepancy in some of the effects. But, we also have a lot of challenges in terms of production of F&V and this is horticultural challenges. We need to understand our bioactive compounds are synthesised in plants, we need to know the nature of these compounds because there is a clear gap of knowledge of the nature of the compounds that are produced. Beta-carotene is not alpha-carotene and is not absorbed the same way by the body and will not have the same effect on health. We need also to standardise the amount and this will be helpful for nutritional recommendations. We need to standardise the content of bioactive compounds in F&V. Just to give you an example, right now the cranberry association in North America are standardising the content of flavanoids and proanthocyanitine to carry clinical trials and use a goal in standards to carry out clinical trials to demonstrate the positive effects of cranberry toward health. We need to understand the phenology of bioactive compounds (BAC) accumulation in F&V and also the varietal content in BAC. It is not all fruits that are equal but banana is not a raspberry and a potato is not a broccoli and we need to know and characterise properly what is the content in BAC and include this information into dietary recommendations. The other thing we need to know because we must manage the crop to increase the content in phyto nutrient and bring through post-harvest storage and in food chain bring these compounds to the public. So there is a lot of information that we need to gather in production systems, horticultural production systems to bring these components to the public.

Challenges for Horticultural Sciences vs Health



So there is an urgent need for communication and discussion between disciplines like Horticulture sciences and Health sciences if we want to move forward and have the information and the credentials to recommend F&V to the population. On the Horticulture we need to characterize BAC forms present in plants and on the Health side we need to characterize BAC forms present and active in the organism. In Horticulture sciences we need to standardize BAC present in plants and know what varieties recommend to the public and this will be important to carry on and validate the human clinical trials to demonstrate the effects of F&V. We need to characterize the nature and interactions of BAC in plants and in Health sciences we need to understand the mode of action of BAC target in the body, the metabolite action, the action in the gut and we need to improve F&V in horticulture and understand what may be the toxicity of these BAC of F&V and maybe one day we will be able to telemeter new healthy F&V to recommend to the population. All of this means we need to interact and there has been a lack of interaction between the different disciplines until now. Horticulturists, doctors, nutritionists have been talking to themselves and there has not been this forum to talk together. This conference is an example but it is my contention that ISHS could be the bridge to create that new forum to have these disciplines to interact and bring some of the functionalities of F&V to the public.

ISHS is a scientific society that has more than 7000 members 135 organization members and more than 53 country members and it organizes symposia in different topics relating to production systems and producing F&V in developed and developing countries. ISHS has a great out bridge in both developed and developing countries. There is a very close collaboration between ISHS and FAO, WHO, Global Horticulture Initiative and other initiatives like Profel and there has been a

Commission created 3 years ago to promote health effects of F&V and this includes organizations conferences and there is a flagship conference called FAVHEALTH. We are producing proceedings that can be consulted through websites and position papers we can contribute to the positive effects of F&V.

FAVHEALTH is an international conference on the science of health effects of F&V and the aim of this conference is to bring the horticultural sciences and the medical, nutritional scientists together to discuss some the key issues relating to health effects of F&V. The first issue took place in Quebec City in 2005. There is going to be the 3rd Int. Symposium on Human Health effects of F&V taking place in Avignon, France in 2009 in October 18th to 21st and will be held at le Palais des Papes and should gather people working in production systems to increase the BAC in F&V but also understanding the mechanisms of action by the medial profession.

To conclude, there have been great trials to demonstrate the bioavailability and the effects of F&V on diseases. There are a lot of evidence that comes from in vitro trials and we must move to human clinical trials and must create communication forums to discuss this area and I think ISHS and FAV HEALTH could be a bridge to bring together the growers, the scientists in horticulture and the medical profession to improve health and the health effects of F&V.