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« F&V CONSUMPTION - SOCIOECONOMIC DETERMINANTS AND HEALTH »

Editorial

The 6th Edition of the EGEA Conference was held in Brussels in May 5-7 2010

Once again this was a highly successful event bringing together distinguished scholars, experts and officials. The theme of the event was Social and Health Benefits of a Balanced Diet: the role of Fruit and Vegetables.

Obesity is an increasing curse in our modern societies. The consequence is an increase in obesity related diseases such as diabetes, cardiovascular diseases and other non-communicable diseases. Obesity is the result of our live style with too little physical activity and an unhealthy diet, where we eat too much food and far too little of Fruit and Vegetables (F&V). Inevitably this lifestyle has an increasing cost for our societies in the treatment of obesity related diseases. Unless we succeed in stopping the trend this cost is only going to further accelerate like a snowball bringing down an avalanche. To this mounting financial cost should be additionally added the emotional cost and stress for individuals suffering from obesity.

The WHO recommends a minimum daily consumption of 400gr of F&V. One of the themes of the Conference was to discuss the link between low consumption of F&V and the prevalence of obesity. Although it is widely assumed that F&V consumption has a beneficial effect on preventing overweight and obesity, it is not easy to demonstrate the causality.

Another aspect considered by the Conference was the fact that low consumption of F&V and higher incidence of obesity is associated with lower socio-economic groups. This creates a vicious circle exacerbating the disadvantages that such groups are already fighting against. The issue is therefore how can we establish policies and introduce instruments to break this circle of disadvantage.

One of these instruments is the newly introduced EU School Fruit Scheme. The School Fruit Scheme was adopted by the EU in 2008 and now 25 out of 27 Member States participate in the programme. This is a fantastic success considering that prior to the introduction of the scheme only 6-7 programs were running on a national basis and only to a limited extent. The idea is to combine the consumption of F&V in schools with a nutrition policy and balanced diet, connecting children with agriculture. The consumption of F&V in itself is not the primary objective, but rather to use the School Fruit Scheme as an opportunity to force health, education and agriculture authorities and stakeholders to work together as "The key to the door". Nutrition, healthy lifestyle, agriculture and environment should be brought into the curriculum as a natural element. We need to invest in our children so that their consumption of F&V during their life is permanently increased.

There is a lot to do if we are to win the fight against obesity and future EGEA conferences will make an important contribution to this battle.

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Dearth in abundance – Characteristics of the current European diets - ENHR II

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Unfavourable dietary habits are the main reason for the high and ever increasing prevalence of overweight and obesity in many parts of the World. At the same time, an excessive intake of energy, fat and sugar does not preclude deficiencies in essential micronutrients as repeatedly evidenced by nutritional surveys. Monitoring the population's nutritional intake and status is important to define critical nutrients and find starting points to improve nutritional behaviour.

The European Nutrition and Health Report 2009 (ENHR II)

Accordingly, the European Nutrition and Health Report, first published in 2004, aims to give an overview of the nutrition and health situation in Europe by compiling data from individual countries using sources such as the Food Balance Sheets (FBS) of the FAO; data of the EU-supported Data Food Networking (DAFNE) project on food availability at household level derived from Household Budget Surveys and the Concise Food Consumption Database from the European Food Safety Authority (EFSA); as well as national dietary surveys.

European diets

The past decades have seen an increase in the supply of not only animal foods especially red meat, poultry, milk products, but also of vegetable oils, Fruits and Vegetables (F&V). A decline can be seen for pulses, potatoes, and to a lesser extent, for cereals. Nevertheless, the proportion of plant and animal products supplied has remained relatively stable in most regions except the South where the latter markedly increased.

From a regional point of view, the great importance of milk products in the Northern diet is salient, while F&V are less consumed. Together with the South, this region also reached the highest supply, availability, and consumption of fish. The South and especially the Central-East showed the highest levels of F&V consumption. Cereals and potatoes are consumed in highest amounts in the Central-East (*see figure 1*), an area that also showed high availability and consumption of meat.

Health implications

Some favourable trends do appear in the European diets over the past four decades such as a decreased supply of animal fat and an increase for fruit, vegetable and fish. Nevertheless, the intake recommendations are not being met in many ways (*see figure 2*). Thus, the amount of at least 400 g/d of F&V recommended by the World Health Organization was only reached in four countries, three of which were located in the Central-Eastern region. Accordingly, mean intakes of dietary fibre and β-carotene, for which F&V present an important source, were highest in this region although the recommended intake levels were not met in many European countries. In turn, intake of folate was lowest in the Central-East and South and highest in the North. The latter, especially the Scandinavian part, also showed the highest mean calcium intakes, reflecting the high consumption of milk products, and was the only region to reach on average the recommendations for vitamin D intake. In the Central-Eastern parts, iodine intake was generally low. Critical micronutrients were broadly the same across the age classes as was the regional pattern. Calcium intake was rather low especially in children aged 10-14, which has potential importance with respect to growth and bone mass.

Overall, intake of macro- and micronutrients showed a high variability, but carbohydrate intake tended to be higher in the North and Central-East. The Southern region showed both, the highest and lowest intake levels of total fat. Intake of saturated fatty acids was generally too high, mostly accounting for >10% of energy intake. Since 1961, the contribution of fat to total energy intake as estimated from the FAO FBS increased from 30 to 35% while it decreased for carbohydrates from 58 to 53%. No change occurred for levels of protein that was constant with 12%. Data from national surveys showed that protein supply was sufficient in all countries and age groups. Energy intake was mostly below or within the reference levels of the German speaking countries and comparable between the regions.

In summary, the average diets of the European regions are rich in energy and energy-providing macronutrients, but at the same time do not contain satisfying amounts of critical nutrients and food components like folate, iodine, and dietary fibre. Consumption of F&V and, in the Central Eastern and Western regions, of fish should also be increased.

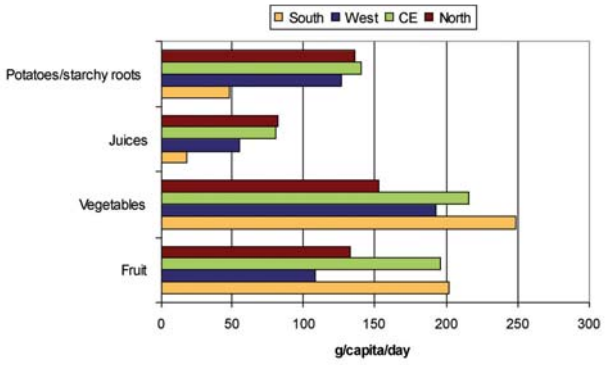

Figure 1: Consumption of starchy roots and potatoes, fruits, vegetables, and fruit and vegetable juices in Europe by region.
Data from the Concise Food Consumption Database from the European Food Safety Authority (EFSA)

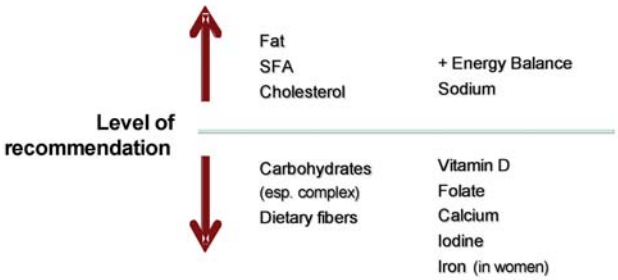

Figure 2: Nutrient intake in Europe as compared to the respective recommended levels

Evidence-based promotion of fruit and vegetable consumption: the importance of socio-economic determinants

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Over the last 15-20 years, campaigns have been made to promote Fruit and Vegetables (F&V) in many countries in Europe and beyond, especially in school-aged children. Most of these campaigns have been school-based. The more recent campaigns combine educational activities with improving availability of F&V in schools by means of school fruit programs. Evidence suggests that such campaigns aiming to improve motivation and opportunities for increased F&V intakes among schoolchildren are effective. These campaigns remain very necessary particularly as recent trend analyses indicate that F&V intakes may be further declining among children from lower educated and lower income parents. The fact that prices of F&V have gone up much more than for the junk foods also does not help this situation.

Promotion of F&V especially among children with a focus on socioeconomic status as a potential important factor is the main subject of this article.

The following questions will be addressed:

1. *What are the important personal and environmental correlates and determinants of F&V intakes? In other words: who eats too little F&V and why?*
2. *How can we target and tailor F&V promotion interventions to these potential determinants? In other words: how can we promote F&V intakes?*

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A special focus will be on school-aged childen.

Who eats too little F&V?

There are differences in F&V intake according to all kinds of socio-demographic variables, such as age, ethnicity, and gender. But the most consistent socio-demographic variable associated with F&V intakes is socioeconomic position. People from lower SocioEconomic Status (SES) groups eat fewer F&V. Socioeconomic position has been defined as an individual social and economic ranking within society, and it is based on access to resources, including income, educational status and also prestige. Most often the level of education is used as a proxy measure for SES.

SES is associated with a broad range of health disparities. In the Netherlands for instance, there is quite a big gap in life expectancy between the highest educated groups and the lowest educated groups. This gap is also apparent in different life style behaviors such as smoking, physical inactivity and different unhealthy nutrition behaviors including low F&V intakes. However, this SES gap in F&V intakes may not be apparent for all age groups in all regions of Europe.

Ritva Prättälä and colleagues[1], for example, showed for adults that there is a greater likelihood of daily use of vegetables for higher educated than people of lower education in the northern European countries. However, this was not true in the southern European countries like Italy or Spain. In France, an inverse relation was found as the lower educated people eat more F&V. Nevertheless, based on systematic reviews, SES comes out as maybe the most consistent correlate of F&V intakes, with lower SES people, and maybe even more consistently so among children, having lower F&V intakes[2-5].

Why do people from lower socioeconomic status eat fewer F&V?

There are three main categories of determinants of health behaviors: motivation, ability, and opportunity[6,7]. Most health promotion campaigns have focused on improving motivation to live more healthily. However, such campaigns have had little success. In recent years more attention has been given to the environmental conditions for health behaviors, i.e. the environmental opportunities for adequate F&V intakes. This links to the WHO slogan 'making the healthy choice the easy choice'. If the opportunities, i.e. the availability and accessibility of F&V are improved, then adequate F&V intake will become easier. Recent research indicates that availability and accessibility of F&V are indeed important determinants of F&V intakes, at least among children[4,5].

The Pro Children Intervention Study, a cross-European project involving nine countries[8] tried to build an evidence-based intervention package on these insights. The intervention package was tested in three different countries in Norway, the Netherlands, and Spain. This intervention included activities to improve motivation by means of classroom activities including taste-testing sessions and computer-tailored (web-based) F&V education, homework assignments, as well as newsletters and computer-tailored feedback for the parents. But the intervention also included a school F&V provision scheme, making F&V better available and accessible in the schools. The results showed an increased knowledge among children, a higher availability, and a higher intake of F&V[9]. Research conducted in Norway indicates that such F&V provisions should be for free and not by paid subscription in order to avoid having children from less affluent parents profit less from the activity[10].

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Quantifying health effects of a low consumption of fruits and vegetables

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The health benefits of a diet rich in Fruits and Vegetables (F&V) are well recognized. F&V consumption has been associated with decreased risks of several chronic diseases, such as cardiovascular diseases, diabetes, obesity, and certain types of cancer. Most evidence comes from large cohort studies like the European Prospective Investigation into Cancer and nutrition (EPIC[1]). This study observed, for example, a protective effect of F&V consumption on a variety of cancers and weight gain[2-4]. However, it is not clear how high the consumption of F&V should be in order to achieve relevant reductions in health risk. Nevertheless, recommendations for the consumption of F&V have been issued by most national and international health agencies. As a population-wide intake goal, the WHO recommends the consumption of a minimum of 400 grams of F&V a day[5]. The Dutch National Food Consumption Survey among young adults (19-30 years) showed that none of the participants consumed at least 200 grams of vegetables and only 8% of the men and 7% of the women consumed 200 grams of fruits per day (including nuts and seeds). When F&V were combined, only 3% of men and 1% of women reached the recommended consumption of 400 grams a day[6].

The health effects of not consuming the recommended intake of F&V can be quantified by model simulations, in which the actual consumption (current scenario) can be compared with the recommended scenario. This has been calculated for The Netherlands[7]. For vegetable consumption, the life expectancy of newborns is 0.41 years shorter for the current low consumption in comparison with the recommended situation (Table 1). In addition, 34,000 deaths and 0.5 billion euros (net present value) of health care costs in the next 20 years are attributable to the lower vegetable consumption if the current low consumption of vegetables is continued. For fruit consumption, the numbers are even larger: the life expectancy of newborns is 0.47 years shorter and the current low consumption of fruits will result in 60,000 deaths and 1.9 billion euros (net present value) in health care costs over the next 20 years. It should be kept in mind that these numbers are based on models using certain conditions and assumptions and depend on the quality of the input data. Recent and detailed data on F&V consumption from national food consumption surveys are essential to maintain the accuracy of the models. In addition, relative risks linking F&V consumption to chronic diseases should be based on (meta-analyses of) large (international) cohort studies or intervention studies.

The health loss due to not consuming the recommended intake of F&V is considerable and the potential health gain of a healthy diet is about two orders of magnitude larger than that attributable to food that is unsafe due to health-threatening substances (Table 2)[8]. In other words, much greater health gains can be made through encouraging a healthy diet than through further improving food safety.

The largest effects on public health are expected from policy geared towards an integrated strategy, in which both the supply side as well as the consumer environment is addressed. As such, a major challenge for the authorities, the food industry, the scientific community and the consumer lies ahead. This challenge may be tackled by joint programming, in which science and technology join forces to contribute more to large social themes, such as a healthy diet for a healthy life. In the Netherlands an integrated approach is already taking place: the Ministry of Health, Welfare and Sport, the Ministry of Agriculture, Nature and Food Quality, and the Food and Consumer Product Safety Authority have aligned the programming of their research in the area of food, nutrition and health.

Table 1. Health loss in life expectancy, number of deaths and health care costs in the Netherlands due to a low consumption of F&V (current-scenario versus recommended scenario)[7].

Factor	Life expectancy for newborns (years)	Number of deaths in next 20 years	Health care costs Fruits in next 20 years (net present value; euros)
Fruits	- 0.47	60,000	1.9 billion
Vegetables	- 0.41	34,000	0.5 billion

Table 2. Comparing estimated health loss and potential health gain by a healthy diet and unsafe food in the Netherlands[8].

Factor	DALYs* / year
Diet composition in total#	245,000
. of which fruits	95,000
. of which vegetables	47,000
Food Safety in total	2,500-6,000

* DALYs = Disability Adjusted Life Years

\# Diet composition of 5 factors (fruits, vegetables, fish, saturated fatty acids and trans fatty acids)

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