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## "CHILDREN NUTRITIONNAL NEEDS: SCHOOL MEALS OR PACKED LUNCHES?"

# Editorial

### The need to increase F&V availability at school

Low consumption of fruit and vegetables (F&V) is a worrying phenomenon among children. According to the Pro-Children study financed by the European Commission, in average only 17.6% of the 11-year-old children reach the WHO minimum recommended level of 400g/day.

One of the reasons of low F&V consumption by children is their apparent lack of availability. According to the same study, only 22% of children reported good availability at school and during leisure-time activities.

Improving the eating habits of children and adolescents is an important strategy for improving public health. Increased F&V consumption can have an immediate effect on maintaining a healthy body weight and reducing the risk of certain diseases over the longer term. Interventions targeting healthy nutrition need to occur early in childhood or during adolescence, in order to prevent or reverse the adverse health effects of overweight and poor eating habits.

This highlights the importance of ensuring an appropriate availability of F&V at school. Schools can reach almost all children and adolescents during their first decades of life and are a critical part of the social environment that shape young people's behavior. The European school fruit scheme with an annual budget of €90 million should generate positive effects and bring benefits to schoolchildren, their parents and teachers as regards increased availability of F&V.

**Lars Hoelgaard**
Deputy Director General, European Commission, Belgium

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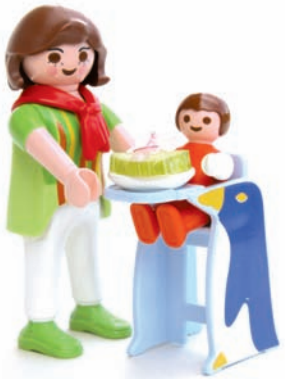




## IFAVA Contact info

**HEAD OFFICE**
**International Fruit And Vegetable Alliance**
**c/o Canadian Produce Marketing Association**
**162 Cleopatra**
**Ottawa, Canada, K2G 5X2**

## IFAVA

**CHAIRMAN:**
C. Rowley, Australia
E-mail : chairman@ifava.org

**VICE CHAIRMAN:**
P. Dudley, New Zealand
E-mail: vicechairman@ifava.org

# School meals in French secondary state schools

— Carine Dubuisson —

Dietary survey unit - Nutritional epidemiology, French Food Safety Agency, France

## School meals: a public health issue

Since the 1980s, overweight among French children aged 3-14 years old has increased and reached 14.5% in 2006-07[1]. In parallel, more than 90% of French secondary state schools have a canteen, serving lunches to nearly 2,650,000 children and dinners to 159,000 boarders[2], almost five days a week. Dietary balanced school meals must therefore be ensured to encourage schoolchildren to adopt healthier eating behaviours. Indeed, controlling the availability of food items in school premises is one way to lead children and adolescents towards healthier food choices at lunchtime[3, 7] and may help to balance their energy intake[7]. In 2001, a circular addressing both the composition of school meals and food safety issues was introduced in France to improve the nutrient composition of school meals[8] and appended the twelve food frequency guidelines*, published in 1999 to guarantee dietary balanced meals[9]. This study aimed at assessing the extent to which secondary state schools are familiar with and implement this circular, based on a nationally representative sample.

## The first French national survey on school meals

In 2005, a cross-sectional survey was carried out on 1,440 lower and upper secondary state schools (i.e. 10-18 year-old children)[10, 11]. These schools came from two independent samples: an exhaustive sample of 240 upper secondary state schools providing agricultural training (AS) and a sample of 1,200 lower and upper secondary schools providing general and vocational teaching (ES), randomly selected among the 7,000 schools housing a cafeteria.

Every school received a questionnaire on its catering service and the implementation of the circular's recommendations, and was requested to enclose all menus (lunches and dinners) served over one month. Every food item was allocated a nutrient composition according to the French national food composition database[12], and was assigned to one or more of the twelve food groups defined by the guidelines, when meeting their specifications. The compliance of schools with regard to each food-group frequency guideline and to the overall twelve food-group guidelines was assessed. Three levels of compliance with these guidelines were defined: low (five or less out of twelve), intermediate (six or seven out of twelve) and high (eight or more out of twelve).

* The food-group frequency guidelines defined the minimum or maximum frequencies with which twelve food groups should be offered for twenty consecutive meals.

## School meal composition needs to improve

Five hundred and seventy ES schools (48%) and 137 AS schools (57%) provided both questionnaire and menus for at least 15 consecutive days. The results confirmed that many French schoolchildren are enrolled to eat in secondary school canteens (94% in AS schools and 67% in ES schools). The twelve food-group frequency guidelines appended to the circular were known by almost 90% of the schools and were reported to be frequently used by 75% of them. However, menu analysis showed that progress is still required to achieve a meal composition in accordance with these guidelines (table 1). Some recommendations were followed by most of the schools, such as limiting high-fat products (starters, fried products and pastries) and providing plenty of raw fruit and vegetables, cooked vegetables and starchy foods. Other guidelines should be implemented further, especially in regard to the nutritional quality of main courses (red meat, meat-fish-or-egg-based dishes, main courses with a protein/lipid ratio <1, fishes) and dairy products which are met by less than a third and a half of schools respectively. Specific efforts are also necessary for evening meals to ensure that the nutritional requirements of boarders are covered. Indeed, evening meals had a much lower level of compliance with the recommendations aiming at improving the quality of the main dishes. Overall, less than 20% of secondary schools reached the high level of compliance to the guidelines, except the AS schools for lunches (48%). Moreover, the level of compliance shifted towards lower values for evening meals.

Meal characteristics (five courses) or some recommendations of the circular, such as the food purchasing manager being trained in nutrition (38% of schools) and the involvement of dietetic expertise when designing meals (6%), seemed to be linked to better dietary balance of meals. Implementation of the circular must therefore be promoted in schools, which may require stronger regulatory nutrition standards.

**Table 1. Prevalence of schools meeting food-group frequency guidelines for 20 meals**

| Food-group | Frequency guidelines | ES schools | | AS schools | |
|---|---|---|---|---|---|
| | | Lunch (n=570) | Dinner(n=137) | Lunch (n=137) | Dinner(n=133) |
| **% of compliance with food-frequency guidelines** | | | | | |
| Starter containing 15% lipids or more | 8 max | 95.5 % | 97.4 % | 86.5 % | 89.1 % |
| Fried product containing 15% lipids or more | 6 max | 100.0 % | 100.0 % | 100.0 % | 100.0 % |
| Pastry containing 15% lipids or more | 4 max | 76.1 % | 77.1 % | 77.5 % | 69.5 % |
| Main course with a protein / lipid ratio < 1 | 2 max | 13.8 % | 3.8 % | 26.7 % | 4.0 % |
| Raw fruit and vegetables | 15 min | 93.6 % | 83.1 % | 89.6 % | 81.7 % |
| Cooked vegetables | 10 min | 62.7 % | 45.2 % | 63.5 % | 57.1 % |
| Starchy food | 10 min | 78.4 % | 88.7 % | 76.1 % | 78.4 % |
| Red meat | 4 min | 24.4 % | 13.6 % | 58.7 % | 9.9 % |
| Fish with a protein / lipid ratio ≥ 2 | 4 min | 10.2 % | 4.9 % | 6.5 % | 1.7 % |
| Preparation including less than 70% fish, meat or eggs | 4 max | 31.9 % | 9.3 % | 55.7 % | 8.4 % |
| Dairy product containing 150 mg of calcium per portion | 10 min | 34.7 % | 51.7 % | 46.0 % | 50.6 % |
| Dairy product containing 100 to 150 mg of calcium per portion | 8 min | 19.8 % | 22.9 % | 20.6 % | 32.1 % |
| **Level of compliance with all food-frequency guidelines** | | | | | |
| Low level (≤ 5 /12) | | 22.4 % | 34.9 % | 18.2 % | 39.2 % |
| Intermediate level (6 to 7 /12) | | 59.2 % | 54.6 % | 38.7 % | 53.7% |
| High level (≥ 8 /12) | | 18.4 % | 10.4 % | 43.1 % | 7.0% |

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# School meals vs. packed lunches in UK

— Gail Rees —
School of Biomedical and Biological Sciences - University of Plymouth, UK

## Background

In England the government announced new standards for school meals in 2006 and these have been gradually phased in. In September 2006, interim food-based standards were introduced and the final food and nutrient-based standards were brought in for primary schools in September 2008 and a year later for secondary schools[1]. However many children prefer to take a packed lunch to school and so their lunchtime meal will not be covered by the new standards and indeed in 2008-09 only 39% of primary school children had a school meal[2]. With large numbers of children bringing food in from home, it is important that packed lunches also follow healthy guidelines.

## A study to investigate the nutritional intake of children at lunchtime

We designed a study to investigate the nutritional intake of children at lunchtime in four primary schools in the South West of England[3]. We compared the intake of children who consumed school meals with those who brought in packed lunches from home. Schools were surveyed in November and December 2006 (after the introduction of the interim food-based standards).

Children were chosen at random from class lists of those children for whom informed consent had been granted. Approximately equal numbers of girls/boys, packed/school lunch were chosen and all were aged between 6-11 years. Participants were observed once at a meal time and the food items consumed or wasted were recorded. Portion sizes were estimated using household measures with help from the catering staff and using the portion size guide on the nutrient analysis programme, CompEat.

## More fruits in packed lunch and More vegetables in school lunch

Of the 120 pupils that took part, 62 had school meals and 58 had packed lunches; 61 were female and 59 were male. The mean energy intake was similar between pupils eating school meals (1856 kJ = 440 kcal) and packed lunches (2058 kJ = 480 kcal). This is just below the standards for a child aged 7-10 years old of 530 kcal (30% of Estimated Average Requirement). Most pupils consuming school lunch ate at least one portion of vegetables with their meal, but only 13% consumed a portion of fruit (Table 1). In the packed lunch group, 58% of pupils consumed a portion of fruit but only 8% (five pupils) ate a portion of vegetables.

School meals offered some nutritional advantages over the packed lunches - they provided half the amount of sugar (11% of dietary energy compared with 22%) and far less sodium on average (542mg compared with 834mg). Conversely, the school meals provided more energy from fat (38% versus 29%) but had less saturated fat, calcium and iron[3].

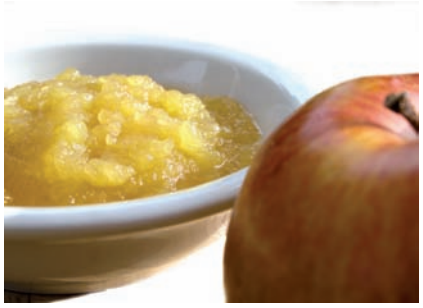
## Fruit is not the first choice...

To be compliant with standards, at least one portion of fruit and one portion of vegetables or salad must be provided per pupil per day. Schools were complying with this and most children having a school lunch did consume at least one vegetable portion. Those not consuming any had left them uneaten (19%). This is in comparison to only five children with packed lunches who ate some vegetables. Unfortunately, most children were not consuming the fruit offered with their school meal. During our survey fresh fruit, fruit salad and fruit crumble were available, but with other desserts still on offer, fruit was not chosen. Fifty-eight percent of pupils with a packed lunch consumed fruit. Most often, if it was provided in the packed lunch, it was eaten along with other dessert items, such as yogurts and biscuits. Children having a school meal choose only one dessert and fruit is not the first choice for most. Improvements are needed in fruit intake in both groups but especially for children having school meals. This could be addressed in school meals by reducing the number of times other desserts are offered or by encouraging fruit as an additional dessert.

Many schools and organisations in the United Kingdom such as the Food Standards Agency and the School Food Trust provide advice on healthy packed lunches. Engaging parents can be a difficult task but perhaps one way forward is the adoption of a packed lunch policy as part of a whole school healthy eating policy. Further research could evaluate such policies and other interventions aimed at improving the content of packed lunches. Future surveys of school meals will hopefully document continued improvements.

Table 1 Percentage of pupils consuming fruit and vegetables

| Food item | School meal % of pupils | Packed lunch % of pupils |
|---|---|---|
| At least 1 portion of fruit | 13 | 58 |
| At least 1 portion of vegetables, salad, beans | 81 | 8 |
| Fruit juice | 10 | 1 |



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# Sack lunches and nutritional needs of young children who attend child care

— Sara J Sweitzer —

Department of Nutritional Sciences, University of Texas at Austin - USA

## Background

Close to 13 million children under the age of six eat three or more meals and snacks daily at child care centers in the United States[1,2]. Federal and state regulations are used as guides for meals and snacks at most centers; however, many child care facilities exist that require parents to provide a daily "sack" lunch from home[3]. A recent study of 197 child care centers in Central Texas showed that 46% had closed their food service. In follow-up phone calls 16 of the center directors reported lunches frequently included "chips" and "junk food", but rarely contained fruits and vegetables[4] (F&V). The American Dietetic Association recommends that children attending full-time child care should receive one half to two thirds of their daily nutritional needs while at centers for eight hours5. The Child and Adult Feeding Program (CACFP) maintain standards for F&V servings for meals and snacks at participating centers[6]. The sack lunch contents of 3-5 year old children in full time care were examined for foods children brought from home[7].

## Evaluation of the content of sack lunches

Seventy-four children attending five childcare centers in two Texas countries had their sack lunch contents recorded through direct observation for three days each for a total of 222 observations. The observations were averaged and compared to 1/3 of each child's age appropriate Dietary Recommended Intake (DRI) and the standard for lunch meals for CACFP programs.

## Sack lunches supply inadequate servings of F&V

Over 50% of the children had an average 3-day lunch contents that provided less than 33% of the DRI for energy (n=58), carbohydrates (n=59), dietary fiber (n=76), vitamin A (n=58), calcium (n=44), iron (n=44) and zinc (n=38). Only 29% (n=65) of the observed lunches provided adequate servings of F&V based on CACFP standards and only 20% (n=44) supplied the minimum servings of milk. The majority of lunches met the meat/meat alternatives and grain/bread servings, 68% (n=151) and 96% (n=197) respectively. Inadequate servings of F&V as well as large numbers of refined grain products contributed to poor dietary fiber content.

Participating parents (n=94) were asked to complete a brief survey about their attitudes toward nutrition and lunch packing habits. Surveys were completed by 51% (n=49) of the parents and 100% indicated that lunch was an important opportunity to receive nutrients for the day. However, 63% (n=31) responded that they tend to pack only foods that they know their child would eat. Further, 55% (n=27) acknowledged that their child sometimes received less than 3-5 servings of F&V per day and consumed excess junk food.

## The need to pack a healthy lunch

This exploratory study provided a snapshot into sack lunches that parents pack for their preschool-aged children who attend child care full time. The results would suggest that although parents know the value of nutritious lunches they may not exhibit the knowledge and skills to pack a healthy lunch and miss the opportunity to help their child learn and practice healthy dietary habits.

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