

# Compliance with French diet recommendations in 3-17-year-old children

## The French nutrition and health survey (ENNS, 2006-2007)

Deschamps V<sup>1</sup>, Malon A<sup>1</sup>, Salanave B<sup>1</sup>, Vernay M<sup>1</sup>, Roudier C<sup>1</sup>, Hercberg S<sup>1,2</sup>, Castetbon K<sup>1</sup>

<sup>1</sup> InVS; Univ Paris13; CRNH IdF, Unité de Surveillance et d'Epidémiologie Nutritionnelle, Bobigny, France

<sup>2</sup> INSERM, U557; INRA, U1125; CNAM, EA3200; Univ Paris13; CRNH IdF, Unité de Recherche en Epidémiologie Nutritionnelle, Bobigny, France

Contact: [valerie.deschamps@univ-paris13.fr](mailto:valerie.deschamps@univ-paris13.fr)

### Introduction

- In France, the French National Nutrition and Health Program (PNNS) is a nutrition policy whose objective is to improve the health status of the population by acting on one of its major determinants, nutrition<sup>1</sup>.

- Particularly among children, the capacity of nutritional policies to account for gender and age-class disparities is a major issue. National surveys are useful to identify such differences.

- Besides, describing compliance with recommendations by using scores enables a comprehensive description of the nutritional situation.

- Our objective was to describe diet with respect to current national recommendations in French children included in the French nutrition and health survey ('Etude nationale nutrition santé', ENNS, 2006-2007)<sup>2</sup>.

### Methods

- National cross-sectional survey including 1,675 3-17-year-old children; sample selection based on a three-phase design.

- Food intake estimated through three 24-h recalls randomly distributed within a two-week period and carried out at home by trained dietitians.

- A score based on the compliance with the French recommendations (PNNS) has been developed for adults. Serving sizes have been presently adapted for children. In addition, physical activity and alcoholic beverage intake did not appear in this score. Finally, the PNNS-GS for children included 11 components taking into account 8 food groups (table 1).

**Table 1:** Diet PNNS guideline score: components, thresholds and scores according to PNNS recommendations among children

| Components                             | Recommendations                                  | Thresholds   | Scores |
|--|--|--|--------|
| 1.Fruits and vegetables                | At least 5 per day                               | 0 – 3.5]   | 0      |
|  |  | (3.5 – 5]  | 0.5    |
|  |  | (5 – 7.5]  | 1      |
|  |  | ≥ 7.5  | 2      |
| 2.Bread, cereals, potatoes and legumes | At each meal, depending on appetite              | 0 – 1]   | 0      |
|  |  | (1 – 3]  | 0.5    |
|  |  | (3 – 6]  | 1      |
|  |  | ≥ 6  | 0.5    |
| - Whole grain foods                    | Choose whole grain products more often           | 0 – 1/3]   | 0      |
|  |  | (1/3 – 2/3]  | 0.5    |
|  |  | ≥ 2/3  | 1      |
|  |  | > 2  | 0      |
| 3.Milk and dairy products              | 3 per day  | 0 – 1]   | 0      |
|  |  | (1 – 2.5]  | 0.5    |
|  |  | (2.5 – 3.5]  | 1      |
|  |  | > 3.5  | 0.5    |
| 4.Meat, poultry, seafood and eggs      | 1 to 2 per day                                   | 0  | 0      |
|  |  | 0 – 1]   | 0.5    |
|  |  | (1 – 2]  | 1      |
|  |  | > 2  | 0      |
| - Seafood                              | At least twice a week                            | < 2 servings per week  | 0      |
|  |  | ≥ 2 servings per week  | 1      |
|  |  | > 2  | 0      |
|  |  | > 2  | 1      |
| 5.Added fats                           | Limit consumption                                | Lipids from added fats ≥ 16% EI†   | 0      |
|  |  | Lipids from added fats < 16% EI  | 1      |
|  |  | Ratio vegetable added fats / total added fats ≤ 0.5                                | 1      |
|  |  | Ratio vegetable added fats / total added fats > 0.5 or no use of animal added fats | 0      |
| - Type of added fats                   | Preferably added fats of vegetable origin        | Simple sugars from sweetened foods ≥ 17.5% EI                                      | -0.5   |
|  |  | Simple sugars from sweetened foods (12.5 – 17.5% EI)                               | 0      |
|  |  | Simple sugars from sweetened foods < 12.5% EI                                      | 1      |
|  |  | > 2  | 0      |
| 6.Sweetened foods                      | Limit consumption                                | < 1 L of water and > 125 mL of soda  | 0      |
|  |  | ≥ 1 L of water and > 125 mL of soda  | 0.5    |
|  |  | < 1 L of water and ≤ 125 mL of soda  | 0.75   |
|  |  | ≥ 1 L of water and ≤ 125 mL of soda  | 1      |
| 7.Non-alcoholic beverages              | Drink water at will<br>Limit sweetened beverages | > 12 grams   | -0.5   |
|  |  | (10 – 12) grams  | 0      |
|  |  | (8 – 10) grams   | 0.5    |
|  |  | (6 – 8) grams<br>≤ 6 grams   | 1.5    |
| 8.Salt                                 | Limit consumption                                | > 12 grams   | -0.5   |
|  |  | (10 – 12) grams  | 0      |
|  |  | (8 – 10) grams   | 0.5    |
|  |  | (6 – 8) grams<br>≤ 6 grams   | 1.5    |

\* Servings per day unless other noted. † EI: energy intake without alcohol.

### Results

- For 12.5 theoretical points maximum, mean score was  $5.9 \pm 1.5$  in boys (range 2.0 -12.0) and  $6.1 \pm 1.5$  in girls (range 1.5 -10.7) with no statistical difference according to the gender (table 2). According to age and gender, the lowest mean score was  $5.7 \pm 1.5$  in boys aged 15-17 years, while girls aged 15-17 years had the highest mean score ( $6.3 \pm 1.6$ ).

**Table 2:** Proportion of children meeting PNNS recommendations

| PNNS recommendations <sup>a</sup>                 | Boys (%)   |            |             |             |            | Girls (%)  |            |             |             |            |
|---|------------|------------|-------------|-------------|------------|------------|------------|-------------|-------------|------------|
|   | 3-6 y-old  | 7-11 y-old | 12-14 y-old | 15-17 y-old | All        | 3-6 y-old  | 7-11 y-old | 12-14 y-old | 15-17 y-old | All        |
| Fruits and vegetables: ≥ 5 serv./d                | 13.9       | 19.0       | 25.2        | 24.9        | 20.4       | 11.8       | 15.6       | 26.8        | 28.2        | 20.1       |
| Bread, cereals, potatoes and legumes: 3-6 serv./d | 15.8       | 44.8       | 50.4        | 50.5        | 39.9       | 17.7       | 28.4       | 32.6        | 27.9        | 26.7       |
| Whole grain food: 2/3 serv./d                     | 3.8        | 6.2        | 11.3        | 7.9         | 7.3        | 4.7        | 8.3        | 9.2         | 13.5        | 8.8        |
| Milk and dairy products: 2.5-3.5 serv./d          | 50.2       | 51.8       | 48.4        | 39.4        | 48.3       | 52.4       | 46.1       | 34.7        | 22.3        | 39.7       |
| Meat, poultry, seafood and eggs: 1-2 serv./d      | 46.9       | 38.6       | 54.3        | 56.6        | 48.2       | 53.7       | 31.7       | 53.6        | 44.0        | 45.1       |
| Seafood: ≥ 2 serv./w                              | 34.0       | 39.1       | 24.9        | 18.9        | 30.4       | 26.6       | 26.8       | 24.2        | 26.1        | 25.9       |
| Added fats: < 16% EI                              | 96.8       | 99.0       | 91.2        | 97.2        | 96.0       | 98.7       | 96.0       | 95.5        | 94.8        | 96.3       |
| Type of added fats: vegetable AF/total >50%       | 37.9       | 29.1       | 36.3        | 32.4        | 33.9       | 29.7       | 29.2       | 37.2        | 36.3        | 32.8       |
| Sweetened foods: <12.5% EI                        | 32.7       | 41.9       | 41.6        | 51.2        | 41.1       | 39.7       | 36.6       | 54.4        | 59.1        | 46.6       |
| Beverages   |            |            |             |             |            |            |            |             |             |            |
| Non-alcoholic beverages: ≥1L water & ≤125ml SB    | 13.9       | 25.5       | 29.8        | 31.8        | 24.8       | 10.5       | 23.5       | 28.3        | 39.2        | 24.9       |
| Salt: < 8 g/d                                     | 94.6       | 79.8       | 62.4        | 43.8        | 72.6       | 92.8       | 84.8       | 78.0        | 86.6        | 85.7       |
| <b>Mean score</b>                                 | <b>6.1</b> | <b>5.9</b> | <b>6.0</b>  | <b>5.7</b>  | <b>5.9</b> | <b>6.1</b> | <b>5.7</b> | <b>6.2</b>  | <b>6.3</b>  | <b>6.1</b> |

<sup>a</sup>serv., servings; EI, total energy intake excluding alcohol; SB, sweetened beverages;

- "Healthy" thresholds were attained by less than 40% of children for "fruits and vegetables", "bread, cereals potatoes and legumes", "whole grain food", "seafood", "type of added fats", and "non alcoholic beverage" in both genders and for "milk and dairy products" in girls (table 2). Nearly all children attained the recommendation for added fat.

- Compliance with recommendations was higher in boys than in girls for "bread, cereals potatoes and legumes" and "milk and dairy products". Girls had a higher level of compliance for salt than boys.

- Percentage of children in accordance with PNNS recommendations increased with age-classes in both genders for "fruits and vegetables", "sweetened foods", and "non alcoholic beverage" and decreased for "milk and dairy products" and salt.

- Higher differences of compliance between boys and girls were for "bread, cereals potatoes and legumes" and "salt", with an opposite age effect. Indeed, while compliance with the "bread, cereals potatoes and legumes" recommendation was comparable in 3-6-year-old boys and girls, the percentage of compliance in 15-17-year-old children was twice lower in girls than in boys. In the other hand, the compliance with salt recommendation was comparable in boys and girls aged 3-6-year-old. Nevertheless, while the percentage of adherence was stable in girls across age categories, in boys this percentage was diminished by half in 15-17-year-old. For all other groups (except for "seafood" which presents the same age affect than for "salt"), changes across age categories were comparable in boys and girls.

### Conclusion

- The mean score shows that compliance with nutritional recommendations can be still improved in France, despite eight years of active public health interventions through the PNNS<sup>1</sup>. Limitations of our analyses (three 24-h recalls, use of an 'a priori' score, bias of participation despite correction through calibration) have to be taken into account in this conclusion.

- Despite mean scores globally comparable, food-group intake widely varies across age and gender groups. Our results of compliance highlight sub-groups in which interventions should be focused. For example, intervention should be focused for salt in boys because their level of compliance decreased with age, and for "whole grain food" in all children because level of compliance was globally very low.

### References

- Hercberg S, Chat-Yung S, Chauliac M. The French national nutrition and health program: 2001-2006-2010. *Int J Public Health* 2008;53:68-77.
- Castetbon K, Vernay M, Malon A *et al.* Dietary intake, physical activity and nutritional status in adults: the French nutrition and health survey (ENNS, 2006-2007). *Br J Nutr* 2009;102:733-43.
- Estaquio C, Kesse-Guyot E, Deschamps V *et al.* Adherence to the French "Programme National Nutrition Santé" guideline score is associated with better nutrient intake and nutritional status. *J Am Diet Assoc* 2009;109:1031-41.