The Director General

Maisons-Alfort, 23 December 2019

OPINION

of the French Agency for Food, Environmental and Occupational Health & Safety

on the updating of the PNNS dietary guidelines for children from four to 17 years of age

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ANSES primarily ensures environmental, occupational and food safety as well as assessing the potential health risks they may entail.
It also contributes to the protection of the health and welfare of animals, the protection of plant health and the evaluation of the nutritional characteristics of food.
It provides the competent authorities with all necessary information concerning these risks as well as the requisite expertise and scientific and technical support for drafting legislative and statutory provisions and implementing risk management strategies (Article L.1313-1 of the French Public Health Code).
Its opinions are published on its website. This opinion is a translation of the original French version. In the event of any discrepancy or ambiguity the French language text dated 23 December 2019 shall prevail.

On 12 July 2016, ANSES received a formal request from the Directorate General for Health to conduct an expert appraisal aimed at updating the French National Nutrition and Health Programme (PNNS) dietary guidelines for children and adolescents.

1. BACKGROUND AND PURPOSE OF THE REQUEST

The scientific basis for establishing the dietary guidelines of the French National Nutrition and Health Programme (PNNS) was updated by ANSES for the general adult population in 2016, on the basis of new dietary reference values and existing data on food consumption and composition (ANSES 2016d).

Since these guidelines concern the general population, i.e. male and female adults excluding special populations, the Director General for Health submitted a formal request to ANSES on 12 July 2016 in order that guidelines could also be formulated for the specific populations of pregnant and breastfeeding women, children and adolescents, the elderly and postmenopausal women. This opinion concerns the specific population of children from four to 17 years of age.

1.1. Background

1.1.1.Current recommendations in France

The previous PNNS recommendations concerning children from four to 17 years of age were published in 2004, on the basis of scientific principles validated by the CES on "Human Nutrition" in December 2003. They are based on the same guidelines as those defined for the adult population, with some specificities for two age groups: 4-11 years and 12-17 years. These specificities were aimed at "achieving the priority objective of preventing obesity and the specific objectives of improving iron, calcium and vitamin D status". Aside from the guidelines and objectives defined for the adult population, therefore, the recommendations for children were aimed more specifically at:

- ensuring protein intake through "protein foods";
- ensuring calcium intake through dairy products;
- ensuring dietary rhythms and limiting snacking;
- limiting the consumption of sweet products.

Since 2004, in the context of assessments concerning the general population, ANSES has issued specific dietary recommendations for children to supplement or clarify the PNNS guidelines published in 2004. These recommendations concern the following foodstuffs:

- Fish

A risk-benefit assessment of fish consumption (ANSES 2010) led the Agency to specify the consumption guideline of two servings of fish per week for the entire population. ANSES recommends including one serving of fish high in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), and varying the species, sources and supply channels (wild, farmed, fishing grounds, etc.). This consumption ensures reaching nutritional requirements for EPA and DHA while limiting the risk of overexposure to chemical contaminants. In addition, as a precautionary measure, girls should avoid the consumption of fish known to bioaccumulate polychlorinated biphenyls (PCBs), such as eel, barbel, freshwater bream, carp and catfish.

- So-called energy drinks

As part of the assessment of the risks associated with the consumption of so-called energy drinks (ANSES 2013), ANSES identified children as a population at risk, especially with regard to the levels of caffeine contained in these drinks. Indeed, given their lower body weight, children and adolescents are at greater risk from the adverse effects of caffeine (such as neurological and psycho-behavioural disorders, cardiovascular disorders, etc.) compared to adults, for the same amount of caffeine consumed. In addition, caffeine consumption by children and adolescents may lead to sleep disorders with adverse effects on cognitive abilities and school performance and, in the longer term, may even increase the risk of somatic disorders (hypertension, cardiovascular disease, diabetes, obesity) and psychiatric disorders (anxiety, depression, etc.). ANSES therefore recommends that children and adolescents avoid caffeine and drinks containing it.

- Intense sweeteners

Following its risk-benefit assessment of intense sweetener consumption (ANSES 2015b), ANSES did not rule out long-term risks in specific populations, especially adult daily consumers and children. In particular, there were insufficient data to exclude the risk of an effect of intense sweeteners on habituation to sweetness, with consequences on food preferences and food intake control. Moreover, the epidemiological data available at the time did not rule out certain risks, in particular weight gain in the event of regular and prolonged consumption.

In the absence of any proven benefit, therefore, especially on weight control, there is no justification for the long-term use of intense sweeteners as a substitute for sugars, particularly in beverages which are their main vector. In this sense, artificially-sweetened beverages, just like sugar-sweetened beverages, should not be consumed to replace water.

1.1.2. Current recommendations abroad

Most other agencies, particularly in Nordic (National Institute for Health and Welfare in Finland 2016) and English-speaking (National Health and Medical Research Council 2013) countries, apply the principle that a child's diet is the same as that of his parents but in quantities adjusted to his energy requirements. The recommendations are therefore generally qualitatively identical regardless of the age group considered, but quantitatively different, with the number and size of servings considered in proportion to the energy requirements. The population of 4-17 year olds is divided into age groups (generally three) whose boundaries vary from country to country, with an additional subdivision in the United States between adolescent girls and boys.

A specific recommendation regarding added sugars or sugar-sweetened beverages is very commonly made because of the short- and medium-term effects of these foods on the risks of overweight and oral health. Behavioural arguments (such as habituation to sweet tastes) are also sometimes put forward. The World Health Organisation (WHO) recommendation that free sugars should not contribute more than 10% of total energy intake (TEI) is systematically referred to (WHO 2015). The consumption of sugar-sweetened beverages such as sodas should remain "occasional", while fruit juices are limited to one glass per day during a meal (and in this case, the glass counts as a serving of fruit).

Similarly, it is recommended to avoid adding salt because of the effects of excessive consumption on blood pressure and the importance of habituating tastes to a low-salt diet.

1.2. Purpose of the request

This opinion focuses on the population of children from four to 17 years of age[1]. Its purpose is to provide the scientific principles for the dietary guidelines established under the PNNS based on the most recent scientific data available.

2. ORGANISATION OF THE EXPERT APPRAISAL

The expert appraisal was carried out in accordance with French standard NF X 50-110 "Quality in Expert Appraisals – General requirements of Competence for Expert Appraisals (May 2003)".

In principle, the recommendations in this opinion apply only to healthy subjects, as children with diseases need to follow a diet adapted to their condition as part of their medical care.

The expert appraisal was based on the latest dietary reference values (ANSES 2016a, EFSA 2017a), on the food categorisation system considered in the context of updating the PNNS dietary guidelines for adults (ANSES 2016d), on an analysis of the nutritional intakes currently observed in France in children, and on a literature review of the epidemiological links between these food categories and children's health.

To this end, ANSES relied on mandated rapporteurs to examine the most recent publications likely to modify current recommendations or identify new ones. Their work was presented and discussed at meetings of the CES on "Human Nutrition" between October 2017 and May 2018.

ANSES also consulted its European counterparts in order to take into account the recommendations in force in the other Member States of the European Union.

In parallel, the CES on "Assessment of the biological risks in foods" (BIORISK) was asked to summarise the recommendations on the prevention of foodborne microbiological risks for children. This collective expert appraisal was carried out during meetings on 30 January and 10 April 2018. The expert appraisal drew on previous Agency opinions and reports, as well as knowledge of the hazards, summarised in the foodborne biological hazard data sheets.

[1] The other populations (children from birth to three years of age, pregnant and breastfeeding women, and the elderly) are each addressed by separate opinions (2017-SA-0145, 2017-SA-0141 and 2017-SA-0143 respectively).

All the data collected were assessed by the CES on "Human Nutrition" and led to recommendations, which were adopted on 5 July 2018.

ANSES analyses interests declared by experts before they are appointed and throughout their work in order to prevent risks of conflicts of interest in relation to the points addressed in expert appraisals.

The experts' declarations of interests are made public via the ANSES website (www.anses.fr).

3. ANALYSIS AND CONCLUSIONS OF THE CES

3.1. Transposition of adult PNNS guidelines to children in proportion to their energy requirements

As with adults, the quality and quantity of children's food affects their health status. Moreover, at this age, growth is a physiological condition that leads to exposure to additional risks in the event of inappropriate intakes of certain nutrients. It is also during this period that certain behaviours and habits are acquired, which will be maintained throughout life. Lastly, diet-related non-communicable diseases (obesity, type-2 diabetes, atherosclerosis, etc.) may be partly favoured by imbalances in dietary intakes from early childhood to late adolescence.

In order to test the working hypothesis that the dietary guidelines for children may be similar to those for adults in proportion to their energy requirements, the CES investigated the specificities of this population that might justify modulating the adult guidelines proposed in 2016. This research was carried out at two levels: firstly, with regard to dietary reference values and secondly, concerning the epidemiological links between food groups consumed during childhood and health, by exploring the scientific literature.

3.1.1. Verification of the extent to which dietary reference values are met

The nutritional intakes from the diets identified for adults by ANSES in 2016 were transposed to children based on their energy requirements. EFSA's reference average requirements for energy intake (ARs) (EFSA 2013) were used for different age and gender groups. With the exception of vitamin C and iron, the dietary reference values (DRVs) established by EFSA (EFSA 2017a) were used to determine the suitability of the "adult" diets transposed in this way. For iron, the DRV defined for women with low menstrual losses was chosen (ANSES 2016a) and for vitamin C, the reference value defined by ANSES and specific to women (ANSES 2016a) was used for adolescent girls.

Only one diet identified in adults was chosen for transposition to children of both sexes. The diet identified from Scenario B2[2] used for women was chosen as it is the most nutrient-dense adult diet. Indeed, comparison of the DRV/AR ratios of children and adults indicated some nutrients (vitamins D, E and B5, calcium, iron and copper) that require a denser diet in proportion to energy intake. On the basis of this diet, which was transposed in proportion to children's energy requirements, children's nutritional intakes were estimated and the extent to which children's DRVs were met was calculated. The results of this assessment are shown in Tables 1 and 2.

[2] The "B2 low iron" scenario corresponds to women with a low iron requirement and fibre intakes above 25 g/d. This is the optimisation scenario that takes dietary habits and all nutritional constraints (with the exception of vitamin D) into account in adult women.

Table 1: Estimated nutritional intakes for boys from transposing the adult reference diet (Scenario B2)

		Adults	4-6 years			7-10 years			11-14 years			15-17 years		
Nutrients	Unit	Intakes	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met
Calorie intakes	kcal	2039	1521	1521	**100%**	1851	1851	**100%**	2263	2263	**100%**	2826	2826	**100%**
EPA + DHA	mg	500	250	373	**149%**	250	454	**182%**	250	555	**222%**	250	693	**277%**
Vitamin A	µg	822	300	613	**204%**	400	746	**187%**	600	912	**152%**	750	1139	**152%**
Vitamin B1	mg	1.2	0.6	0.9	**141%**	0.8	1.1	**141%**	0.9	1.3	**141%**	1.2	1.7	**141%**
Vitamin B2	mg	2.0	0.7	1.5	**209%**	1.0	1.8	**178%**	1.4	2.2	**155%**	1.6	2.7	**170%**
Vitamin B3	mg	18	10	13	**131%**	12	16	**131%**	15	20	**131%**	19	25	**131%**
Vitamin B5	mg	5.9	4.0	4.4	**110%**	4.0	5.4	**134%**	5.0	6.5	**131%**	5	8.2	**164%**
Vitamin B6	mg	2.1	0.7	1.6	**224%**	1.0	1.9	**191%**	1.4	2.3	**166%**	1.7	2.9	**171%**
Vitamin B9	µg	379	140	283	**202%**	200	344	**172%**	270	421	**156%**	330	525	**159%**
Vitamin B12	µg	6.5	1.5	4.8	**323%**	2.5	5.9	**236%**	3.5	7.2	**206%**	4.0	9.0	**225%**
Vitamin C	mg	110	30	82	**274%**	45	100	**222%**	70	122	**174%**	100	152	**152%**
Vitamin D	µg	3.4	15	2.5	**17%**	15	3.1	**21%**	15	3.8	**25%**	15	4.7	**31%**
Vitamin E	mg	14	9	10	**116%**	9	13	**141%**	13	16	**120%**	13	19	**149%**
Magnesium	mg	378	230	282	**123%**	230	343	**149%**	300	420	**140%**	300	524	**175%**
Phosphorus	mg	1526	440	1138	**259%**	440	1385	**315%**	640	1694	**265%**	640	2115	**330%**
Calcium	mg	1058	800	789	**99%**	800	960	**120%**	1150	1174	**102%**	1150	1466	**128%**
Manganese	mg	4.6	1.0	3.4	**343%**	1.5	4.2	**278%**	2.0	5.1	**255%**	3.0	6.4	**213%**
Iron	mg	11	7.0	8.2	**117%**	11	10	**91%**	11	12	**111%**	11	15	**139%**
Copper	mg	2.0	1	1.5	**149%**	1.0	1.8	**182%**	1.3	2.2	**171%**	1.3	2.8	**213%**
Zinc	mg	11	5.5	8.2	**149%**	7.4	10	**135%**	10.7	12	**114%**	14.2	15	**107%**
Selenium	µg	83	20	62	**310%**	35	75	**215%**	55	92	**167%**	70	115	**164%**
Iodine	µg	150	90	112	**124%**	90	136	**151%**	120	166	**139%**	130	208	**160%**
Fibre	g	26	14	19	**139%**	16	24	**148%**	19	29	**152%**	21	36	**172%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol, 6 µg β-carotene, 12 µg provitamin A
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): 1 µg DFE = 1 µg dietary folate + 1.7 x 1 -µg folic acid

Table 2: Estimated nutritional intakes for girls from transposing the adult reference diet (Scenario B2)

		Adults	4-6 years			7-10 years			11-14 years			15-17 years		
Nutrients	Unit	Intakes	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met
Calorie intakes	kcal	2039	1417	1417	**100%**	1726	1726	**100%**	2048	2048	**100%**	2253	2253	**100%**
EPA + DHA	mg	500	250	347	**139%**	250	423	**169%**	250	502	**201%**	250	552	**221%**
Vitamin A*	µg	822	300	571	**190%**	400	696	**174%**	600	826	**138%**	650	908	**140%**
Vitamin B1	mg	1.2	0.6	0.8	**141%**	0.7	1.0	**141%**	0.9	1.2	**141%**	0.9	1.3	**141%**
Vitamin B2	mg	2.0	0.7	1.4	**195%**	1.0	1.7	**166%**	1.4	2.0	**141%**	1.6	2.2	**135%**
Vitamin B3**	mg	18	9.5	12	**131%**	12	15	**131%**	14	18	**131%**	15	20	**131%**
Vitamin B5	mg	5.9	4.0	4.1	**103%**	4.0	5.0	**125%**	5.0	5.9	**119%**	5.0	6.5	**130%**
Vitamin B6	mg	2.1	0.7	1.5	**208%**	1.0	1.8	**178%**	1.4	2.1	**151%**	1.6	2.3	**145%**
Vitamin B9***	µg	379	140	263	**188%**	200	321	**160%**	270	381	**141%**	330	419	**127%**
Vitamin B12	µg	6.5	1.5	4.5	**301%**	2.5	5.5	**220%**	3.5	6.5	**187%**	4.0	7.2	**180%**
Vitamin C	mg	110	30	76	**255%**	45	93	**207%**	70	110	**158%**	110	122	**110%**
Vitamin D	µg	3.4	15	2.4	**16%**	15	2.9	**19%**	15	3.4	**23%**	15	3.8	**25%**
Vitamin E	mg	14	9.0	10	**108%**	9.0	12	**132%**	11	14	**128%**	11	15	**141%**
Magnesium	mg	378	230	263	**114%**	250	320	**128%**	250	380	**152%**	250	418	**167%**
Phosphorus	mg	1526	440	1060	**241%**	440	1292	**294%**	640	1533	**239%**	640	1686	**263%**
Calcium	mg	1058	800	735	**92%**	800	896	**112%**	1150	1063	**92%**	1150	1169	**102%**
Manganese	mg	4.6	1.0	3.2	**320%**	1.5	3.9	**260%**	2.0	4.6	**231%**	3.0	5.1	**169%**
Iron	mg	11	7.0	7.6	**109%**	11	9.3	**85%**	11	11	**100%**	11	12	**110%**
Copper	mg	2.0	1.0	1.4	**139%**	1.0	1.7	**154%**	1.1	2.0	**183%**	1.1	2.2	**201%**
Zinc	mg	11	5.5	7.6	**139%**	7.4	9.3	**126%**	10.7	11	**103%**	11.9	12	**102%**
Selenium	µg	83	20	58	**288%**	35	70	**201%**	55	83	**152%**	70	92	**131%**
Iodine	µg	150	90	104	**116%**	90	127	**141%**	120	151	**126%**	130	166	**127%**
Fibre	g	26	14	18	**129%**	16	22	**138%**	19	26	**137%**	21	29	**137%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol or 12 µg β-carotene
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): 1 µg DFE = 1 µg dietary folate + 1.7 x 1 µg folic acid

Regarding the distribution of macronutrients in TEI, the results from the adult food optimisation scenarios were very similar regardless of the scenario. This distribution is compared to the reference intake ranges for macronutrients established by ANSES (ANSES 2016a) in Table 3.

Table 3: Reference intake ranges for macronutrients for children and results for the adult reference diet (Scenario B2)

	Adult reference diet	4-5 years	6-9 years	10-13 years	14-17 years
Proteins	17%	6-16%	7-17%	9-19%	10-20%
Fats	35%	35-40%			
Carbohydrates (excluding fibre)	45%	40-55%			

These data indicate that transposing the results obtained with the optimisation tool for adults to the diets of children of different age and gender groups enables all the DRVs to be met, with the exception of:

- vitamin D in all children four to 17 years of age;
- iron in all children 7-10 years of age;
- calcium in girls aged 4-6 and 11-14 years of age.

Regarding vitamin D, the expert appraisal conducted for adults (ANSES 2016d) showed that the DRV as currently defined cannot be met by diet alone, given the food supply and consumption habits observed. This was confirmed by the absence of an optimisation solution in adults when this constraint was taken into account. The DRV for vitamin D established by EFSA for children is identical to that of adults and is always defined under the assumption of zero endogenous dermal synthesis. However, the CES points out that, in addition to food intake, vitamin D is synthesised by the deep cells of the epidermis. This production requires direct exposure of the epidermis to sunlight. Engaging in outdoor activities therefore helps promote this exposure.

Regarding calcium, transposing the intake corresponding to the reference diet for adults to children enables between 90% and 130% of the DRV to be met, depending on the age and gender groups. Transposing the dietary guidelines proposed for adults is not therefore entirely sufficient and the guidelines should be adapted so that children's diets are slightly higher in calcium than those recommended for adults (as will be developed in Section 3.3.2).

Regarding iron, transposing the intake from the adult reference diet to children enables 100% of the DRV to be met for all except 7-10 year olds (85% of the DRV for girls and 91% of the DRV for boys). Therefore, as with calcium, this nutrient will be analysed in more detail in Section 3.2.3.

For some nutrients, on the other hand, after transposing the nutritional intakes from the reference diet, intakes that largely exceed children's DRVs by a factor of two or even three were observed. This was the case for vitamins A, B2, B6, B9, B12 and C and phosphorus, manganese, copper and selenium.

For vitamins C, B9[3] and B12, manganese and phosphorus, there is no upper intake limit (UL). For the other nutrients, the intakes calculated in this model remain below the ULs defined for children (EFSA 2017b) (see Annex 2).

The study of the transposition of the adult reference diet to children was also conducted on the basis of other scenarios: Scenario C2 for men, which took constraints related to contaminants into account, and Scenario B6 for women, in which constraints related to consumption habits were more flexible (see Annex 3). The results regarding coverage of children's DRVs were generally similar to those

[3] There is no UL expressed in folates.

obtained under Scenario B2, which helped ensure that the approach used to transpose the diets from adults to children was relevant because it is not very sensitive to variations in diets identified in adults.

3.1.2. Epidemiological data

A review of the scientific literature was conducted on the links between the consumption of food groups during childhood and adolescence and the risk of chronic non-communicable diseases during childhood and later in adulthood. The health outcomes were chosen using the same selection criteria as in the analysis conducted for the adult population (ANSES 2016c), namely a high prevalence or incidence of the disease in the population, a high proportion of the risk attributable to diet, and the absence of predominant non-food risk factors. The literature search focused on colon, breast and prostate cancers, cardiovascular disease, diabetes and obesity. Low bone mineral density as a risk factor for osteopaenia and osteoporosis in adulthood was added to this list.

Similarly, the food groups considered in this search were the same as those selected for the adult population, namely: dairy products, eggs, fruits, vegetables, nuts, wholegrain and refined cereal products, breakfast cereals, meat, delicatessen meats, fish and seafood, confectionery, sugar-sweetened beverages and fruit juices.

The articles selected reported exclusively prospective observational studies or meta-analyses of prospective studies. The search excluded studies that focused solely on food profiles or nutrients or contaminants, descriptive studies of consumption levels without any link to the selected diseases, and studies that focused on populations in low- and middle-income countries.

A total of 16 original studies and one meta-analysis were reviewed. The size of the populations included in these studies was often small (less than 2000 individuals) and follow-up was relatively short.

3.1.2.1. Obesity and weight change

Fruits and vegetables

Only one cohort study looked at fruit and vegetable consumption in 1252 children followed between six and 10 years of age, with estimated food consumption at inclusion and at 10 years of age. The analysis did not identify any link between fruit and vegetable consumption or changes in this consumption and the change in children's body mass index (BMI) over this period (Bayer *et al.* 2014).

Sugar-sweetened beverages

The link between sugar-sweetened beverage consumption and weight change, adiposity and/or risk of obesity was assessed in a meta-analysis published in 2013 and comprising 15 longitudinal studies with a total of 25,745 children and adolescents (Malik *et al.* 2013). The analysis concluded that there was a positive relationship between sugar-sweetened beverage consumption and the change in body mass index over one year with an increase of 0.07 $kg.m^{-2}$ [0.01-0.12] for each additional 350 mL daily serving. In the three studies with a one-year follow-up and an adjustment for energy consumption (15,736 children), the annual increase in BMI related to the consumption of one daily serving was 0.06 $kg.m^{-2}$ [0.02-0.10].

Data from the ALSPAC cohort (Avon Longitudinal Study of Parents and Children, 2455 children) indicated that at 13 years of age, waist circumference, BMI and body fat percentage were positively associated with changes in sugar-sweetened beverage consumption between the ages of 10 and 13. This association remained significant after adjusting for physical activity at 13 years of age, pubertal stage, maternal weight status and changes in consumption of fruit juice, fruits and vegetables and fat between 10 and 13 years of age (Bigornia *et al.* 2015).

A Dutch study on a smaller population (114 boys and 124 girls) reported a positive link between consumption of sugar-sweetened beverages excluding fruit juices at age 13 and trunk fat 30 years later in men, but not in women (Stoof *et al.* 2013).

In another prospective study of 1433 adolescents followed since birth, high consumption of sugar-sweetened beverages at 17 years of age (> 331 mL/day) was associated with an increased risk of obesity or overweight (OR = 3.8 [1.5-9.3]) compared to low consumption (< 130 mL/d) at the same age (Ambrosini *et al.* 2013).

Dairy products

Three prospective studies evaluated the relationship between the consumption of dairy products in children or adolescents and changes in BMI and/or the risk of overweight, with contradictory results. In the ALSPAC study (2455 children), the authors did not observe any link between the risk of obesity or excessive adiposity at 13 years of age and the consumption of dairy products at 10 years of age in a multi-adjusted model (Bigornia *et al.* 2014), but reported an inverse association between the consumption of full-fat dairy products and the change in BMI between 10 and 13 years of age. Conversely, an American study of 12,829 children from nine to 14 years of age reported a positive relationship between milk consumption and the change in BMI over one year (Berkey *et al.* 2005). A third small prospective study (92 children included in the Framingham children's cohort) concluded that dairy consumption at 3-6 years of age was inversely associated with BMI at 10-13 years of age as well as with body fat gain between these two periods (Moore *et al.* 2016).

3.1.2.2. Diabetes

Dairy products

The relationship between consumption during adolescence and the risk of type-2 diabetes in adulthood was assessed in a single study involving 37,038 women participating in the Nurses' Health Study II (Malik *et al.* 2011). Compared to women with the lowest consumption of dairy products in adolescence (median: 0.5 serving/1000 kcal), those with the highest consumption (median: 2 servings/1000 kcal) had a reduced risk of type-2 diabetes (RR = 0.62 [0.47-0.83]) after adjusting for the risk factors identified in adolescence. This benefit persisted after adjustment for the risk factors identified in adulthood and was mitigated after adjustment for the consumption of dairy products in adulthood. When considering the consumption of dairy products during adolescence and adulthood together, women with high consumption of dairy products during both periods had a lower risk of type-2 diabetes than those with low consumption during these same periods (RR = 0.57 [0.39-0.82]).

3.1.2.3. Cardiovascular diseases

The link between childhood food consumption and mortality from heart attack or stroke was examined in a single prospective study involving 4334 British children aged 0-19 years at inclusion in 1937-1939 (Ness *et al.* 2005). The results of the model adjusted only for age, sex and energy consumption did not show any link between childhood food consumption and the risk of mortality from myocardial infarction. In a multi-adjusted model, the risk of death from stroke was inversely associated with vegetable consumption and positively with fish consumption.

Fruits and vegetables

Three prospective studies on relatively small sample sizes (< 2000 subjects) examined the link between food consumption at 3-17 years and cardiovascular risk factors.

In the National Growth and Health Study (NGHS), the authors assessed the relationship between childhood and adolescent food consumption in 1369 18-20 year old North American girls and the number of cardiometabolic risk factors (waist circumference ≥ 88 cm, blood pressure ≥ 90th percentile for age and sex, LDL cholesterol ≥ 110 mg/dL, HDL cholesterol < 50 mg/dL, triglycerides ≥ 110 mg/dL and HOMA-IR[4] ≥ 4) (Moore *et al.* 2016). Higher fruit and vegetable consumption (> 360 g/d) was associated with fewer cardiometabolic risk factors at 18-20 years of age. After adjusting for other risk factors, girls consuming more than 360 g of fruits and vegetables and more than 480 mL "milk equivalent" of dairy products were at a lower risk of having at least three cardiometabolic risk factors (RR = 0.52 [0.30-0.89]).

[4] Homeostasis Model Assessment of insulin resistance

In a second study of 1622 subjects followed for 27 years after inclusion at an age between three and 18 years (Young Finns Study), an inverse relationship was observed between the level of vegetable consumption in childhood and pulse wave velocity, an indicator of adult arterial rigidity, after adjustment for lifestyle and other risk factors (Aatola *et al.* 2010).

In the Framingham Children's Study, the blood pressure of 95 children from three to six years of age was monitored regularly until the age of 12 years (Moore *et al.* 2005). Consumption of more than four servings of fruit and vegetables per day or two servings of dairy products before six years of age was associated with a lower increase in systolic pressure between six and 12 years of age.

Sugar-sweetened beverages

In the Western Australian Pregnancy Cohort study, high intake of sugar-sweetened beverages at 17 years of age (> 335 g/d) was associated with an increased risk of belonging to the "cardiometabolic risk" group defined on the basis of BMI, systolic blood pressure, HDL cholesterol and HOMA-IR (OR = 2.7 [1.3-5.6]) among girls but not among boys (Ambrosini *et al.* 2013).

3.1.2.4. Cancer

Fruits

The relationship between childhood and adolescent food consumption and adult cancer incidence and mortality was reported in a prospective study involving 4999 subjects (Maynard *et al.* 2003). Fruit consumption during childhood was inversely associated with the total incidence of cancer during the follow-up period but not with breast cancer.

Conversely, fruit consumption was inversely associated with the risk of breast cancer before menopause in a prospective study of 44,223 women aged 27-44 who completed a questionnaire on their diet during adolescence and participated in the Nurses' Health Study II (Farvid *et al.* 2016). The relative risk of breast cancer was 0.75 [0.62-0.90] for the fifth quintile of consumption (median: 2.9 servings/day) compared to the first quintile (median: 0.5 servings/day).

Red meat

In the same cohort, a positive association between red meat consumption during adolescence and the risk of breast cancer before menopause was reported with a 20% relative risk increase for each additional 100 g/day serving (Linos *et al.* 2008).

Only one study was identified concerning the possible link between childhood food consumption and the risk of colon or rectal cancer in adulthood. In this study of 292,797 subjects aged 40 to 61 years at the time of inclusion, food consumption at 12-13 years was retrospectively assessed using a frequency questionnaire (Ruder *et al.* 2011). No relationship was observed between the consumption of different food groups at 12-13 years of age and the risk of rectal cancer. However, the results showed a significant increase in colon cancer risk with the level of processed meat consumption, which disappeared after adjustment for recent processed meat consumption.

3.1.2.5. Bone mineral density

Dairy products

Only one small prospective study (84 children in the Framingham cohort) reported higher bone mineral content, bone surface area and bone mineral density (+6%, +3% and +3%, respectively) in children with dairy consumption of two or more servings per day compared to those with fewer than two servings per day (Moore *et al.* 2008).

3.1.2.6. Conclusion on the epidemiological data

This literature search only identified a few studies. The results did not show any child-specific links between the consumption of certain food groups during childhood and adolescence and the health outcomes selected. The data confirmed the positive link between the consumption of sugar-sweetened beverages and the increase in BMI or adiposity already identified in adults (ANSES 2016c), as well as the inverse relationship between the consumption of fruit and vegetables and

certain cardiovascular risk factors, and the link between the consumption of dairy products and the risk of type-2 diabetes also already identified in adults. None of these results call into question the recommendations for adults based on the epidemiological links between food and health, which can therefore be applied to children and adolescents.

3.1.3. Conclusion on the suitability of the adult PNNS guidelines for children

Transposing the dietary guidelines proposed for adults as part of the updating of the PNNS guidelines (ANSES 2016d) to children, in proportion to their energy requirements, enables their nutritional requirements to be met overall. Furthermore, the CES did not identify any epidemiological data in the literature on child-specific links between diet and the risk of chronic disease development. In qualitative terms, therefore, the dietary guidelines for adults are valid recommendations for children and it seems consistent in practice to have the same guidelines for both children and adults. In quantitative terms, since children's energy requirements are different from those of adults, the size of the servings consumed should be adjusted.

3.2. Main differences between observed and recommended intakes – identification of vector foods

Observational data indicate that the nutritional situation of children is unsatisfactory, particularly for certain nutrients for which risks associated with inappropriate intakes have been identified in children. Previous work by ANSES (ANSES 2015a, 2016b, 2017) has identified and prioritised the nutrients for which children are at high risk of inappropriate intakes (either inadequate or excess). This evidence, combined with the characterisation of the hazards associated with such inadequate or excess intakes in children, led the CES to focus particularly on four nutrients: calcium, iron, sugars and sodium.

This situation could be corrected by emphasising the importance of certain foods or food groups known as "levers", i.e. those for which it is important and urgent to change the current diet of most children and bring them more in line with the final recommendations.

3.2.1. Calcium

It is particularly important to meet calcium requirements during childhood, as this is the main nutrient involved in bone mineralisation. During childhood, sufficient calcium intakes help firstly to ensure the minimum necessary mineralisation according to the growth in skeletal volume, and secondly to increase mineral density to reach optimal peak bone mass at the end of the growth period. Since blood calcium levels are kept constant at the expense of exchangeable bone calcium, the plasma mineral peak reached in adolescence is an important factor in good bone mineralisation in adulthood and in maintaining bone mass, with the aim of preventing osteoporosis (Martin 2001).

ANSES's opinion (ANSES 2015a) indicated high prevalences of inappropriate calcium intakes among children aged 10 to 17 years (from 57% in boys aged 13-15 years to 80% in girls aged 16-17 years).

The CES therefore believes that particular attention should be paid to calcium intakes in children, with an emphasis on defining dietary guidelines for foods that are vectors of calcium. For both adults and children, the food group that contributes most to meeting calcium requirements is dairy products[5] (according to the INCA 3 survey data: 50% for 11-17 year olds and 45% for adults). Other groups that contribute significantly to calcium intakes are fruits and vegetables (6.5% for children and 10% for adults) and water (6.9% for 11-17 year olds, 12% for adults).

In view of the heterogeneity of the types of products included in the "dairy products" group and in order not to neglect other possible sources of calcium, the CES carried out a specific analysis of foods contributing to calcium intake in children.

[5] The dairy products group includes milk, yoghurts and *fromage blanc*, and cheeses.

According to the INCA 2 survey data, the main contributors to calcium intakes were identified, firstly for individuals whose requirements are not met and secondly for those whose requirements are met. The following observations emerge:

- dairy products contribute considerably more to calcium intake in individuals whose requirements are met, with the exception of dairy-based desserts and cream desserts, which contribute relatively more in those whose requirements are not met;
- plant-based sources of calcium (vegetables, potatoes, fruits and fruit juices) and water contribute more in individuals whose requirements are not met;
- the contribution of cereal products (bread and breakfast cereals) is broadly the same for those whose requirements are met and those whose requirements are not met.

These data suggest that meeting the nutritional requirement for calcium is currently facilitated by the consumption of dairy products.

They also indicate that among children at risk of not meeting their calcium requirements, who are therefore more likely to consume few dairy products, plant-based (vegetables and potatoes) or mineral sources (water) of calcium become more important contributors.

The CES therefore considers that dairy products are the most appropriate lever for facilitating the coverage of children's calcium requirements, but that there are alternatives, particularly for children who consume few dairy products.

Other preferred sources of calcium are plant-based sources such as leafy vegetables, which can provide up to 140 mg/100 g for a very low calorie content, or pulses (up to 120 mg/100 g), and water such as some types of mineral water (up to 55 mg/100 mL). The CES points out that tap water only contains an average of 7 mg of calcium per 100 mL and that the use of filter jugs reduces the calcium concentration (ANSES 2016e). The CES also draws attention to the fact that calcium from plant sources is generally less bioavailable than that provided by foods of animal origin, although the available data are insufficient for precisely quantifying the respective absorption rates of these two calcium sources. In addition, the CES reiterates that certain products of plant origin, such as plant-based drinks (soy beverages, almond milk, coconut milk, etc.) or desserts are not significant sources of calcium (for example, 12 mg/100 g in a standard unenriched soy beverage compared with 116 mg/100 g in UHT cow's milk). It is therefore necessary to ensure that these plant-based beverages and desserts used as alternatives to dairy products contain added calcium.

3.2.2. Iron

Strong height and weight growth during childhood and menstrual losses in girls during adolescence result in high iron requirements. The prevalence of inappropriate iron intakes in girls aged 13 to 17 years is around 25% (ANSES, 2015).

The main contributors to iron intake in children aged 11 to 17 years are cereal products (24%, including 11% for breakfast cereals and 9.5% for bread), meat-fish-eggs and meat-fish-egg-based foods (20%, including 8.4% for meat), croissant-like pastries, cakes, sweet pastries and biscuits (12%), sandwiches, pizzas, pies, savoury pastries and biscuits (7.2%) and dairy products (7%) (ANSES 2017).

The CES noted that consumption of meat and fish can make it easier to achieve the dietary reference value for iron in children. It does not therefore seem appropriate to reduce serving sizes of this food group offered to children in proportion to energy intake, and these should be close to adult serving sizes. This can naturally be the case when using products that are already portioned (such as beefburgers or pre-packaged fish fillets). In addition, transposition of the results from Scenario B6 (see Annex 3), in which the consumption bounds of iron-rich food subgroups (wholemeal bread, other fish, pulses, nuts and dried fruits) were extended, indicated better coverage of the dietary reference value for iron than with transposition of the results from Scenario B2. The CES concluded that there are other levers that can make it easier to achieve the dietary reference value for iron in

children, in particular plant-based sources such as pulses (2.45 mg/100 g of cooked green lentils, i.e. about the same amount as in 100 g of cooked beefburger), nuts (3 mg/100 g of almonds) or wholemeal bread (2.1 mg/100 g).

3.2.3. Total sugars excluding lactose and galactose

In its opinion of 2 December 2016 (ANSES 2016b), ANSES established a threshold not to be exceeded of 100 g/d of total sugars (mono- and disaccharides) excluding lactose and galactose (ELG) for adults. This limit was estimated from a fructose adverse-effect threshold, transposed to total sugars (glucose, sucrose, glucose-fructose syrups, honey or other syrups and natural concentrates containing fructose), based on the fructose content of common sugars. It does not therefore apply to sugars that do not contain fructose, such as lactose and galactose, for which the CES has not identified any risk.

This threshold was initially used to characterise intakes of total sugars ELG observed in children in the INCA 2 population, and to identify the main vector foods for children whose intakes reached or exceeded this threshold. The results showed high prevalences of the 100 g/d threshold being exceeded in all age groups (15% for 4-7 year-olds, 25% for 8-12 year-olds and 13-17 year-olds) and 95th percentile intakes that may be of concern from a very early age (122 g/d for boys 4-7 years of age) and more particularly in adolescents (145 g/d for boys 13-17 years of age).

However, this maximum intake threshold of 100 g/d was established for the adult population and not for children. The child population has characteristics (metabolic, behavioural, physiological, etc.) that justify the establishment of specific thresholds. In the absence of data on the effects of sugar consumption on children's health, taste acquisition and development, and dietary behaviour, as well as on the impact of these effects on health in adulthood, the CES took a pragmatic approach to qualify the intakes currently observed in children in France in a more relevant way. This is in line with the general approach chosen by the CES to transpose the guideline values from adults to children.

The threshold value of 100 g/d established for adults in 2016 was weighted by the ARs for energy proposed by EFSA (EFSA 2013) for a physical activity level (PAL) of 1.6. Three age groups were considered: 4-7 years, 8-12 years and 13-17 years. The mean AR for energy for each of these age groups was calculated and used to transpose the 100 g/d threshold. Adopting a protective approach, the 100 g threshold was considered for the AR for energy of young adults aged 18-29 years, which is the highest among the ARs in the different adult age groups. This is consistent with the WHO's approach, where the recommendation on added sugar intake is expressed in terms of total energy intake (WHO 2015).

The transposed thresholds are therefore as follows:

- 4-7 years: 60 g/day
- 8-12 years: 75 g/day
- 13-17 years: 100 g/day

Comparing these thresholds with intakes of total sugars ELG from the INCA 2 survey population, very high prevalences of the thresholds being exceeded were observed among the youngest children: 75% of 4-7 year olds, 60% of 8-12 year olds and 25% of 13-17 year olds had intakes above the thresholds considered for these different age groups.

Foods that are vectors of total sugars ELG had widely differing contributions in high-consuming children compared to low consumers, in all age groups. For example:

- a much higher contribution from sugar-sweetened beverages (soft drinks) and fruit juices among high sugar consumers compared to those who do not exceed the threshold;
- a slightly higher contribution from sugars and derivatives (table sugar and confectionery) among the highest sugar consumers;
- a generally identical and universally high contribution from biscuits/pastries/cakes and chocolate;
- a slightly higher contribution from fruits, dairy products (including chocolate beverages) and breakfast cereals among the lowest sugar consumers.

The CES notes that the contribution of fruits tended to be higher among the lowest consumers of total sugars ELG, suggesting that an increase in fruit consumption is compatible with a concomitant reduction in the consumption of other foods that are associated with total consumption of total sugars ELG.

In addition, regarding consumption occasions, the INCA 2 data indicated a trend towards a higher contribution to intakes of total sugars ELG from the afternoon snack, compared to other meal occasions, in individuals who exceed the maximum consumption threshold. Reducing sugar intakes on this occasion could therefore provide an additional lever for reducing sugar intakes in high consumers. The CES considers that the afternoon snack is not necessarily the right occasion for consuming sweet products (especially with energy-dense products in large servings). It also points out that morning or afternoon snacks (AFSSA 2004) should not be perceived as a necessity and should only be offered in response to real signs of hunger.

These data led the CES to identify two priority levers for reducing the very excessive intakes of total sugars ELG in children: sugar-sweetened beverages (soft drinks and fruit juices) and pastries/biscuits/cakes. These foods, which are frequently offered for the after school snack, could be substituted by foods lower in total sugars ELG that are not associated with the overconsumption of these sugars, such as plain dairy products, fresh fruits and nuts. Other major vectors for total sugars ELG could be addressed by a more general recommendation to limit "added sugars", especially in fruit purees, breakfast cereals and dairy products.

More generally, preparing "homemade" foods using raw or slightly processed products helps control additions of sugars (table sugar, honey, jam, etc.) and therefore intakes of total sugars ELG. Preferring "homemade" foods does not systematically ensure a reduction in intakes of total sugars ELG because the industrial offer presents a wide range of levels of total sugars ELG for the same type of food. However, preparing "homemade" foods makes it easier for children and parents to visualise the amounts of sugar and become more aware of all the daily intakes. Controlling additions of sugar also provides an opportunity to gradually reduce intakes without needing to change the nature of the food and therefore the consumer's habits. Conversely, in processed industrial products, added sugars are not easily identifiable by the consumer because they may be included in various different ingredients used for their sweetening power (glucose-fructose syrups, syrups or concentrated fruit juices, musts, etc.) and the consumer cannot visualise the quantities in practical terms. In addition, the regulatory provisions do not require sugars added by the manufacturer to be mentioned in the mandatory nutrition declaration.

3.2.4. Sodium

It has now been established that excessive sodium intakes in adulthood may be associated with high blood pressure. This relationship is less well documented in children, but there is evidence to suggest that it is the same (Geleijnse *et al.* 1997, Hofman *et al.* 1983).

In addition, high sodium intakes can increase urinary calcium losses and reduce calcium balance and thus bone mineralisation, which increases the risk of osteoporosis in the elderly (Evans *et al.* 1997, Ho *et al.* 2001, Nordin *et al.* 1993). Moreover, studies suggest that high blood pressure-related abnormalities in calcium metabolism detected in childhood persist into adulthood (Cappuccio *et al.* 2000). High blood pressure may therefore be an early marker of osteoporosis risk in adulthood.

Lastly, eating habits acquired during childhood and adolescence have an influence on dietary behaviour in adulthood. A taste for salt and salty foods is acquired in childhood. The goal of reducing sodium intakes in the adult population could therefore be more easily achieved if a strong liking for salty-tasting foods was not developed or maintained earlier in life (Liem 2017).

To date, there is no widely accepted reference value for sodium and salt intakes in children. As part of the revision of the adult guidelines, ANSES set an objective not to increase sodium intakes and

chose the median consumption value as the maximum value not to be exceeded: 2273 mg/d for women and 2994 mg/d for men (excluding sodium from added salt).

The INCA 2 survey data indicated that children from four to 10 years of age consume an average of 2090 mg/d of sodium and children aged 11-17 consume 2300 mg/d. In addition, a quarter of children from four to 10 years of age have intakes greater than 2400 mg/d (for an average body weight of 24 kg in the INCA 3 survey), i.e. above the threshold adopted for women (for an average body weight of 60 kg).

An analysis of the main contributors to sodium intakes in the INCA 2 population, by sodium consumption quartile, was conducted among adults, and children aged 4-10 years and 11-17 years of age. Regardless of age group, the comparison of quartiles 1 and 4 showed a much higher contribution from delicatessen meats, the "bread and dried bread products" group and condiments and sauces (including added salt) in quartile 4. Conversely, the contribution from fruits and vegetables and pulses tended to be higher in quartile 1.

With regard to sodium, these data do not call into question the relevance of applying the dietary guidelines proposed for adults to children. In addition, in the case of sodium, whose intakes are related to the salty taste of food, acquiring habituation to a less salty diet from an early age makes it easier to follow recommendations on sodium intake in adulthood.

3.3. Recommendations of the CES

3.3.1. General recommendations

The CES believes that from a qualitative point of view, the guidelines intended for the adult population, as defined by ANSES in 2016 (ANSES 2016d), enable all the nutritional requirements of children of all age groups in this opinion to be met without exceeding the upper intake levels. The whole family can therefore share the same dishes during meals, as long as they comply with the dietary guidelines as defined for the adult population. In addition, consumption habits acquired in childhood can be maintained throughout life and make it easier to follow dietary recommendations in adulthood.

From a quantitative point of view, since children's energy requirements are different from those of adults, the quantities consumed should be adapted. For example, in young children, the serving size offered during meals should be reduced compared to that of adults, with the exception of foods that are sources of iron and calcium. For adolescents, the serving size can be increased if necessary. For pre-packaged industrial products, particularly those specifically targeted at children or offered in public catering facilities, the CES recommends the use of serving sizes adapted to the needs of the youngest.

In general, both for adults and children, attention should be paid to the overall energy density (amount of calories per 100 g or 100 mL) and nutritional density (amount of nutrients per 100 kcal) of food intakes. The CES recommends avoiding energy-dense food intakes because they promote energy overconsumption and provide few valuable nutrients (i.e. so-called "empty calories", such as soft drinks and confectionery). In particular, for the after school snack or any other snack occasion especially conducive to the consumption of such foods, the CES points out that there are other nutritionally beneficial options available that are suited to these consumption occasions. These include fresh fruit, plain or slightly sweetened dairy products, dried fruit and nuts. In this regard, the CES reiterates that food intake outside the three structured meals is not strictly necessary and should only occur in response to real signs of hunger.

The analysis of the CES Biorisk, provided in Annex 4, presents general measures to prevent microbiological risks and foods to be avoided in children under 10 years of age, in order to reduce the risk of infection. This concerns raw or undercooked meat, raw milk and cheeses made from raw milk (with the exception of hard pressed cheeses such as gruyère or comté). For children under six

years of age, raw eggs and products made from raw or undercooked eggs, raw shellfish and raw fish should also be avoided.

3.3.2. Recommendations for calcium

Given the importance of meeting calcium requirements during childhood and the high prevalence of inappropriate intakes observed in children in France, the CES believes that the dietary guidelines for children should highlight the food groups that are vectors of calcium for this population.

Due to consumption habits, dairy products are the most appropriate lever for facilitating the coverage of children's calcium requirements, but there are other options, such as leafy vegetables, pulses and some types of mineral water, which are important for children who consume few dairy products.

As dairy products are generally presented in individual servings, the CES stresses that it is important to choose products packaged in small or portionable servings (*petit-suisse* pots, or *fromage blanc* in a family-size pot), which enables the serving size to be adapted to the requirements of the youngest children. In addition, from a qualitative point of view, and in line with the other guidelines, the CES recommends choosing fresh dairy products that are either plain or slightly sweetened.

Although calcium from plant sources is generally less bioavailable than that provided by food of animal origin, these sources remain valuable vectors of calcium because they also provide other nutrients for a low calorie content. In addition, the CES reiterates that plant-based drinks (soy beverages, almond milk, coconut milk, etc.) or desserts are only significant sources of calcium when they have specifically been fortified with this mineral.

3.3.3. Recommendations for iron

Consuming meat and fish can help all children achieve the dietary reference value for iron. It does not therefore seem appropriate to reduce serving sizes of this food group offered to children in proportion to energy intake. These should be close to adult serving sizes. On the other hand, the CES reiterates its recommendation to limit the consumption of red meat (ANSES 2016d).

Based on the transposition to children of the results of Scenario B6 for adults, the CES concludes that there are other levers that can make it easier to achieve the dietary reference value for iron in children, in particular plant-based sources such as wholegrain cereals, pulses, nuts and dried fruits.

3.3.4. Recommendations for total sugars excluding lactose and galactose

The CES believes that children's intakes of total sugars ELG are excessive in all age groups. Reducing the consumption of sugar-sweetened beverages (soft drinks and fruit juices) and pastries/biscuits/cakes, especially during the after-school snack, are the priority levers for reducing these excessive intakes. The CES therefore recommends offering children fresh fruit, plain or slightly sweetened dairy products, dried fruits or nuts and water, especially for the after-school snack, as a substitute for pastries/biscuits/cakes and sugar-sweetened beverages.

The CES believes that consumption of sugar-sweetened beverages, which include fruit juices, should remain occasional and less than one glass per day. In this respect, the CES reiterates that fruit juices are classified in the sugar-sweetened beverages category and should not therefore be counted as a serving of fruit (ANSES 2016d).

In addition, the CES states that preparing "homemade" foods using raw or slightly processed products helps control additions of sugar and provides an opportunity to gradually reduce intakes without needing to change the nature of the food. Conversely, in industrial products, added sugars are not easily identifiable by the consumer because they may be included in various different ingredients, and the regulatory provisions do not require manufacturer to mention ”added sugars” in the mandatory nutrition declaration.

Lastly, the CES points out that fresh fruits, apart from fruit juices, are the most nutritionally valuable vector of total sugars ELG and recommends giving preference to this source of total sugars ELG.

3.3.5. Recommendations for sodium

As with adults, sodium intakes in children should be limited, especially in order to develop food preferences and consumption habits from a very early age that are consistent with the dietary guidelines and recommendations intended for adults.

Since sodium is already found widely in foods, it is not necessary to add salt when preparing and consuming them. In addition, the food groups that contribute to excessive sodium intakes are the same for children and adults. The dietary guidelines proposed for adults should therefore be applied to children in order to limit their sodium intakes.

3.4. Conclusions of the CES

The CES on "Human Nutrition" believes that it is appropriate to apply the dietary guidelines developed for the adult population to children from four to 17 years of age (ANSES 2016d).
Nevertheless, the serving sizes need to be adapted to the energy requirements of children and adolescents. These guidelines also require certain adaptations and restrictions to take risks into account, particularly microbiological and chemical risks. In addition, to meet the iron and calcium requirements, they should include specific recommendations on contributing foods and serving sizes.

The CES on "Human Nutrition" also wishes to draw attention to the fact that children have excessive intakes of total sugars excluding lactose and galactose, and to the associated risks. The CES stresses that the after-school snack, as generally consumed, is a major contributor to these excessive intakes.

4. AGENCY CONCLUSIONS AND RECOMMENDATIONS

ANSES adopts the conclusions and recommendations of the CES on "Human Nutrition".

This work supplements the Agency's work in formulating dietary guidelines under the PNNS for different types of populations: the adult population, children from birth to three years of age, postmenopausal women and the elderly, and pregnant or breastfeeding women. It may be further supplemented by work carried out for populations with dietary restrictions such as vegetarians or vegans.

This work does not incorporate any economic, social or environmental considerations, only nutritional risk considerations and recommendations for the prevention of foodborne microbiological risks. It does not take into account the variability of nutritional compositions or levels of contaminants and pesticide residues according to crop varieties, production systems, storage and processing conditions, preparation methods, etc.

This expert appraisal by the CES on "Human Nutrition" validated the assumption, adopted by many national agencies, that dietary guidelines for children are identical to those for adults, in proportion to their energy requirements. From a qualitative point of view, therefore, the guidelines intended for the adult population, as proposed by ANSES in 2016, enable all the nutritional requirements of children of all age groups to be met without exceeding the upper intake levels. From a quantitative point of view, the amounts consumed should be adapted, and the serving sizes reduced in younger children or increased in adolescents if necessary. In addition, to meet the iron and calcium requirements of all children, these guidelines should include specific recommendations on contributing foods and serving sizes.

In order to carry out this expert appraisal within the time available, to verify its working hypothesis, the CES chose to use the intakes estimated for adults using compositions weighted on the basis of adult consumption, and to transpose them to children in proportion to their energy requirements. These transposed intakes were compared with the dietary reference values for vitamins and minerals updated by EFSA in 2017. The choice of dietary reference values for the population of children in France will be consolidated by ANSES in a later expert appraisal.

For sugars, intake thresholds were calculated from the threshold established for the adult population and were not defined from child-specific data. However, children's characteristics (metabolic, behavioural, etc.) may justify an in-depth expert appraisal on the effects of sugar consumption on health, taste acquisition and development, and dietary behaviour, as well as on the impact of these effects on health in adulthood. Nevertheless, the thresholds used for this expert appraisal enable the currently observed intakes to be objectively assessed.

The nutritional situation and dietary behaviour currently observed in children in France require specific recommendations aimed in particular at limiting excessive sugar intakes. ANSES notes that these intakes are excessive in the majority of children. Intake levels among the youngest children are of particular concern. In view of the health risks associated with this consumption, ANSES believes it urgent to implement effective measures to reduce the consumption of total sugars.

In this respect, ANSES reiterates the recommendations that were issued as part of its expert appraisal on sugar intakes in adults. These recommendations are also valid for children, and emphasis should be placed on the priority levers for limiting consumption of certain types of foods, such as sugar-sweetened beverages (soft drinks and fruit juices) and pastries/biscuits/cakes, as well as the consumption occasions most conducive to these excessive intakes (after-school snack and other snacks). By extension, ANSES recommends limiting the consumption of these high-energy foods that provide few nutrients of interest.

These conclusions are in line with a broader policy on the marketing of foods intended for children, for which the WHO has issued a set of recommendations (WHO 2010, 2018). This policy aims to reduce the impact on children of marketing of foods high in saturated fats, *trans* fatty acids, free sugars or salt, by reducing children's exposure and the strength of marketing messages in favour of these foods.

Dr Roger Genet

KEYWORDS

Plan national nutrition santé, risque santé, nutrition, consommation alimentaire, nutriment, référence nutritionnelles, repères alimentaires, enfants, adolescents, sucre, calcium, fer, sodium.

French National Nutrition and Health Plan, health risk, nutrition, food intake, nutrient, dietary reference value, food-based dietary guidelines, children.

GLOSSARY

Dietary recommendation: a recommendation on consumption of a food or food group to achieve a dietary guideline level.

Dietary reference value: a reference value for a nutrient. These may include the average requirement (AR), population reference intake (PRI), adequate intake (AI), reference intake range (IR) or upper intake level (UL).

Dietary guideline: the level of consumption of a food or food group or other consumption characteristic that is beneficial to health.

REFERENCES

Aatola, H., T. Koivistoinen, N. Hutri-Kahonen, M. Juonala, V. Mikkila, T. Lehtimaki, J. S. Viikari, O. T. Raitakari, and M. Kahonen. 2010. "Lifetime fruit and vegetable consumption and arterial pulse wave velocity in adulthood: the Cardiovascular Risk in Young Finns Study." *Circulation* 122 (24):2521-8. doi: 10.1161/CIRCULATIONAHA.110.969279.

AFSSA. 2004. Avis de l'Agence française de sécurité sanitaire des aliments relatif à la collation matinale à l'école. Maisons-Alfort: AFSSA.

Ambrosini, G. L., W. H. Oddy, R. C. Huang, T. A. Mori, L. J. Beilin, and S. A. Jebb. 2013. "Prospective associations between sugar-sweetened beverage intakes and cardiometabolic risk factors in adolescents." *Am J Clin Nutr* 98 (2):327-34. doi: 10.3945/ajcn.112.051383.

ANSES. 2010. Consommation des poissons, mollusques et crustacés : aspects nutritionnels et sanitaires pour l'Homme. Maisons-Alfort: ANSES.

ANSES. 2013. Évaluation des risques liés à la consommation de boissons dites « énergisantes ». Maisons-Alfort: ANSES.

ANSES. 2015a. Avis de l'Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail relatif à l'évaluation des apports en vitamines et minéraux issus de l'alimentation non enrichie, de l'alimentation enrichie et des compléments alimentaires dans la population française : estimation des apports usuels, des prévalences d'inadéquation et des risques de dépassement des limites de sécurité. Maisons-Alfort: ANSES.

ANSES. 2015b. Evaluation des bénéfices et des risques nutritionnels des édulcorants intenses. Maisons-Alfort: ANSES.

ANSES. 2016a. Actualisation des repères du PNNS : élaboration des références nutritionnelles. Maisons-Alfort: ANSES.

ANSES. 2016b. Actualisation des repères du PNNS : établissement de recommandations d'apport de sucres. Maisons-Alfort: ANSES.

ANSES. 2016c. Actualisation des repères du PNNS : étude des relations entre consommation de groupes d'aliments et risque de maladies chroniques non transmissibles. Maisons-Alfort: ANSES.

ANSES. 2016d. Actualisation des repères du PNNS : révision des repères de consommations alimentaires. Maisons-Alfort: ANSES.

ANSES. 2016e. Avis de l'Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail relatif à l'évaluation de l'innocuité et l'efficacité des carafes filtrantes. Maisons-Alfort: ANSES.

ANSES, Santé publique France, Ministère des solidarités et de la santé, Ministère de l'agriculture et de l'alimentation, . 2017. Actualisation de la base de données des consommations alimentaires et l'estimation des apports nutritionnels des individus vivant en France par la mise en oeuvre de la 3ème étude individuelle nationale des consommations alimentaires (Etude INCA3). Maisons-Alfort: ANSES.

Bayer, O., I. Nehring, G. Bolte, and R. von Kries. 2014. "Fruit and vegetable consumption and BMI change in primary school-age children: a cohort study." *Eur J Clin Nutr* 68 (2):265-70. doi: 10.1038/ejcn.2013.139.

Berkey, C. S., H. R. Rockett, W. C. Willett, and G. A. Colditz. 2005. "Milk, dairy fat, dietary calcium, and weight gain: a longitudinal study of adolescents." *Arch Pediatr Adolesc Med* 159 (6):543-50. doi: 10.1001/archpedi.159.6.543.

Bigornia, S. J., M. P. LaValley, L. L. Moore, K. Northstone, P. Emmett, A. R. Ness, and P. K. Newby. 2014. "Dairy intakes at age 10 years do not adversely affect risk of excess adiposity at 13 years." *J Nutr* 144 (7):1081-90. doi: 10.3945/jn.113.183640.

Bigornia, S. J., M. P. LaValley, S. E. Noel, L. L. Moore, A. R. Ness, and P. K. Newby. 2015. "Sugar-sweetened beverage consumption and central and total adiposity in older children: a prospective study accounting for dietary reporting errors." *Public Health Nutr* 18 (7):1155-63. doi: 10.1017/S1368980014001700.

Cappuccio, F. P., R. Kalaitzidis, S. Duneclift, and J. B. Eastwood. 2000. "Unravelling the links between calcium excretion, salt intake, hypertension, kidney stones and bone metabolism." *J Nephrol* 13 (3):169-77.

EFSA. 2013. "Scientific Opinion on Dietary Reference Values for energy." *EFSA Journal* 11 (1). doi:

10.2903/j.efsa.2013.3005.

EFSA. 2017a. "Dietary Reference Values for nutrients Summary report." *EFSA Supporting Publications* 14 (12). doi: 10.2903/sp.efsa.2017.e15121.

EFSA. 2017b. Overview on Tolerable Upper Intake Levels as derived by the Scientific Committee on Food (SCF) and the EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). European Food Safety Agency.

Evans, C. E., A. Y. Chughtai, A. Blumsohn, M. Giles, and R. Eastell. 1997. "The effect of dietary sodium on calcium metabolism in premenopausal and postmenopausal women." *Eur J Clin Nutr* 51 (6):394-9.

Farvid, M. S., W. Y. Chen, K. B. Michels, E. Cho, W. C. Willett, and A. H. Eliassen. 2016. "Fruit and vegetable consumption in adolescence and early adulthood and risk of breast cancer: population based cohort study." *BMJ* 353:i2343. doi: 10.1136/bmj.i2343.

Geleijnse, J. M., A. Hofman, J. C. Witteman, A. A. Hazebroek, H. A. Valkenburg, and D. E. Grobbee. 1997. "Long-term effects of neonatal sodium restriction on blood pressure." *Hypertension* 29 (4):913-7.

Ho, S. C., Y. M. Chen, J. L. Woo, S. S. Leung, T. H. Lam, and E. D. Janus. 2001. "Sodium is the leading dietary factor associated with urinary calcium excretion in Hong Kong Chinese adults." *Osteoporos Int* 12 (9):723-31. doi: 10.1007/s001980170047.

Hofman, A., A. Hazebroek, and H. A. Valkenburg. 1983. "A randomized trial of sodium intake and blood pressure in newborn infants." *Jama* 250 (3):370-3.

Liem, D. G. 2017. "Infants' and Children's Salt Taste Perception and Liking: A Review." *Nutrients* 9 (9). doi: 10.3390/nu9091011.

Linos, E., W. C. Willett, E. Cho, G. Colditz, and L. A. Frazier. 2008. "Red meat consumption during adolescence among premenopausal women and risk of breast cancer." *Cancer Epidemiol Biomarkers Prev* 17 (8):2146-51. doi: 10.1158/1055-9965.EPI-08-0037.

Malik, V. S., A. Pan, W. C. Willett, and F. B. Hu. 2013. "Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis." *Am J Clin Nutr* 98 (4):1084-102. doi: 10.3945/ajcn.113.058362.

Malik, V. S., Q. Sun, R. M. van Dam, E. B. Rimm, W. C. Willett, B. Rosner, and F. B. Hu. 2011. "Adolescent dairy product consumption and risk of type 2 diabetes in middle-aged women." *Am J Clin Nutr* 94 (3):854-61. doi: 10.3945/ajcn.110.009621.

Martin, A. 2001. *Apports nutritionnels conseillés pour la population française, 3e ed.* Paris: Tec et Doc Lavoisier.

Maynard, M., D. Gunnell, P. Emmett, S. Frankel, and G. Davey Smith. 2003. "Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: the Boyd Orr cohort." *J Epidemiol Community Health* 57 (3):218-25.

Moore, L. L., M. L. Bradlee, D. Gao, and M. R. Singer. 2008. "Effects of average childhood dairy intake on adolescent bone health." *J Pediatr* 153 (5):667-73. doi: 10.1016/j.jpeds.2008.05.016.

Moore, L. L., M. R. Singer, M. L. Bradlee, and S. R. Daniels. 2016. "Adolescent dietary intakes predict cardiometabolic risk clustering." *Eur J Nutr* 55 (2):461-468. doi: 10.1007/s00394-015-0863-8.

Moore, L. L., M. R. Singer, M. L. Bradlee, L. Djousse, M. H. Proctor, L. A. Cupples, and R. C. Ellison. 2005. "Intake of fruits, vegetables, and dairy products in early childhood and subsequent blood pressure change." *Epidemiology* 16 (1):4-11.

National Health and Medical Research Council. 2013. Australian Dietary Guidelines. Canberra: National Health and Medical Research Council.

National Institute for Health and Welfare in Finland. 2016. Eating together - food recommendation for families with children. Helsinki: Finnish Ministry of Social Affairs and Health.

Ness, A. R., M. Maynard, S. Frankel, G. D. Smith, C. Frobisher, S. D. Leary, P. M. Emmett, and D. Gunnell. 2005. "Diet in childhood and adult cardiovascular and all cause mortality: the Boyd Orr cohort." *Heart* 91 (7):894-8. doi: 10.1136/hrt.2004.043489.

Nordin, B. E., A. G. Need, H. A. Morris, and M. Horowitz. 1993. "The nature and significance of the relationship between urinary sodium and urinary calcium in women." *J Nutr* 123 (9):1615-22. doi: 10.1093/jn/123.9.1615.

WHO. 2010. Set of Recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva, Switzerland: World Health Organization.

WHO. 2018. Evaluating implementation of the WHO Set of Recommendations on the marketing of foods and non-alcoholic beverages to children. Progress, challenges and guidance for next steps in the WHO European Region. Geneva, Switzerland: World Health Organization.

Ruder, E. H., A. C. Thiebaut, F. E. Thompson, N. Potischman, A. F. Subar, Y. Park, B. I. Graubard, A. R. Hollenbeck, and A. J. Cross. 2011. "Adolescent and mid-life diet: risk of colorectal cancer in the NIH-AARP Diet and Health Study." *Am J Clin Nutr* 94 (6):1607-19. doi: 10.3945/ajcn.111.020701.

Stoof, S. P., J. W. Twisk, and M. R. Olthof. 2013. "Is the intake of sugar-containing beverages during adolescence related to adult weight status?" *Public Health Nutr* 16 (7):1257-62. doi: 10.1017/S1368980011002783.

WHO. 2015. Guideline: sugars intake for adults and children. Geneva: World Health Organization.

ANNEX 1 PRESENTATION OF PARTICIPANTS

PREAMBLE: The expert members of the Expert Committees and Working Groups or designated rapporteurs are all appointed in a personal capacity, *intuitu personae*, and do not represent their parent organisation.

EXPERT COMMITTEE

- CES on "Human Nutrition" – 2015-2018

Chair

Mr François MARIOTTI – Professor (AgroParisTech) – Specialities: metabolism of proteins, amino acids, nutritional requirements and recommendations, postprandial metabolism, cardiometabolic risk

Members

Ms Catherine ATLAN – University Lecturer-Hospital Practitioner – Doctor (Luxembourg Hospital Centre) – Specialities: endocrinology, metabolic diseases and nutrition

Ms Catherine BENNETAU-PELISSERO – Professor (Bordeaux Sciences Agro) – Specialities: phyto-oestrogens, isoflavones, endocrine disruptors, bone health

Ms Marie-Christine BOUTRON-RUAULT – Research Director (CESP Inserm) – Specialities: nutritional epidemiology and cancer, digestive system

Mr Jean-Louis BRESSON – University Professor-Hospital Practitioner (AP-HP Necker Hospital – Sick Children, Centre for Clinical Investigation 0901) – Specialities: epidemiology, immunology, infant nutrition, pregnant women and proteins

Mr Olivier BRUYERE – University Professor (University of Liège) – Specialities: epidemiology, public health, osteoporosis

Ms Blandine de LAUZON-GUILLAIN – Research Director (INRA, CRESS, Villejuif) – Specialities: epidemiology, infant nutrition, nutrition of pregnant and breastfeeding women, public health

Ms Anne GALINIER – University Lecturer – Hospital Practitioner (Paul Sabatier University – Toulouse University Hospital) – Specialities: metabolism of adipose tissue/obesity, pathophysiology

Mr Jean-François HUNEAU – Professor (AgroParisTech) – Speciality: human nutrition

Ms Emmanuelle KESSE-GUYOT – Research Director (INRA, UMR Inserm U1153/INRA U1125/CNAM/University of Paris 13) – Specialities: epidemiology, nutrition and pathologies, nutrition and public health

Ms Corinne MALPUECH-BRUGERE – University Professor (University of Clermont Auvergne) – Specialities: nutrition of pathologies, metabolism of macro- and micronutrients

Ms Catherine MICHEL – Research Manager (INRA, UMR INRA/University, Nantes) – Specialities: infant nutrition, intestinal microbiota, colic fermentation, prebiotics

Ms Béatrice MORIO-LIONDORE – Research Director (INRA Lyon) – Specialities: human nutrition, energy metabolism

Ms Jara PEREZ-JIMENEZ – Contract Researcher (ICTAN – CSIC, Madrid) – Specialities: micro-constituents, nutrition and pathologies, bioavailability

M. Sergio POLAKOF – Research Manager (INRA Clermont-Ferrand/Theix) – Specialities: nutrition and pathologies, nutrition and public health, energy metabolism

Mr Jean-Marie RENAUDIN – Hospital Practitioner (Emilie Durkheim Hospital Centre) – Speciality: allergology

Ms Anne-Sophie ROUSSEAU – University Lecturer (University of Nice Sophia Antipolis) – Specialities: nutrition and physical activity, bioavailability, oxidative stress

Mr Luc TAPPY – University Professor – Hospital Practitioner (University of Lausanne) – Specialities: endocrinology, metabolism of carbohydrates

Mr Stéphane WALRAND – Research Director (INRA Clermont-Ferrand/Theix) – Specialities: pathophysiology, protein metabolism and amino acids

- CES on "Assessment of the biological risks in foods" (BIORISK)

Chair

Ms Isabelle VILLENA – Reims University Hospital. Parasitology, infectious diseases

Members

Mr Jean-Christophe AUGUSTIN – Alfort National Veterinary School. Modelling, quantitative risk assessment, food microbiology

Ms Anne BRISABOIS – ANSES, Laboratory for Food Safety. Food microbiology, microbial ecology, analytical methods

Mr Frédéric CARLIN – INRA. Food microbiology (plant products), *Listeria monocytogenes*, sporulated bacteria

Mr Olivier CERF – Emeritus professor, Alfort National Veterinary School. Microbiological risk assessment, food microbiology

Mr Pierre COLIN – Emeritus professor. University of Western Brittany. Food hygiene and microbiology (meat and meat products – poultry)

Mr Philippe DANTIGNY – AgroSup Dijon. Mycology, decontamination procedures, microbial ecology

Ms Florence DUBOIS-BRISSONNET – AgroParisTech. Food microbiology, mechanisms of adaptation to stress, biofilms, hygiene of surfaces and processes

Mr Michel FEDERIGHI – ONIRIS, Nantes. Food hygiene and microbiology (meat and meat products), decontamination processes

Mr Benoît FOLIGNE – Faculty of Pharmacy, Lille. Intestinal microbiota, food ecosystem/microbiota interaction

Ms Florence FORGET-RICHARD – INRA. Mycotoxins, filamentous fungi, biochemistry, cereal production sectors

Mr Philippe FRAVALO – University of Montreal. Food hygiene and microbiology (meat and meat products)

Mr Pascal GARRY – Ifremer, Nantes. Food hygiene and microbiology (meat and meat products, shellfish)

Mr Michel GAUTIER – Agrocampus Ouest. Food microbiology, molecular biology, genetic engineering

Mr Laurent GUILLIER – ANSES, Laboratory for Food Safety. Modelling, quantitative risk assessment, food microbiology

Ms Nathalie JOURDAN-DA SILVA – French Public Health Agency. Epidemiology of enteric diseases and zoonoses

Mr Alexandre LECLERCQ – Institut Pasteur. Food microbiology (*Listeria monocytogenes*, *Yersinia* enteric pathogens), phenotypic and molecular methods

Mr Simon LE HELLO – Institut Pasteur. *Salmonella,* epidemiology, phenotypic and molecular methods

Mr Eric OSWALD – Toulouse University Hospital. Clinical infectious diseases, microbial ecology, *E. coli*

Ms Nicole PAVIO – ANSES, Maisons-Alfort Laboratory for Animal Health Virology

Ms Sabine SCHORR-GALINDO – University of Montpellier 2. Mycology, microbial ecology

Ms Muriel THOMAS – INRA. Intestinal microbiota, probiotics

RAPPORTEURS

Ms Blandine de LAUZON-GUILLAIN – Research Director (INRA, CRESS, Villejuif) – Specialities: epidemiology, infant nutrition, nutrition of pregnant and breastfeeding women, public health

Ms Béatrice MORIO-LIONDORE – Research Director (INRA Lyon) – Specialities: human nutrition, energy metabolism

ANSES PARTICIPATION

Scientific coordination of the project was provided by the Nutritional Risk Assessment Unit of the Risk Assessment Department (DER), under the direction of Ms Irene MARGARITIS – Seconded University Professor (University of Nice Sophia Antipolis).

Scientific coordination

Ms Sabine HOUDART – Scientific Project Manager – Nutritional Risk Assessment Unit, Risk Assessment Department – ANSES

Ms Pauline KOOH – Scientific and Technical Project Manager – Foodborne Risk Assessment Unit – Risk Assessment Department – ANSES (for aspects relating to microbiological risks)

Scientific contribution

Ms Sabine HOUDART – Scientific Project Manager – Nutritional Risk Assessment Unit, Risk Assessment Department – ANSES

Ms Sabrina HAVARD – Scientific Project Leader – Methods and Studies Unit – Risk Assessment Department – ANSES

Administrative secretariat

Ms Virginia SADE – Risk Assessment Department – ANSES

ANNEX 2 EUROPEAN UPPER INTAKE LEVELS (EFSA 2017B) FOR NUTRIENTS FOR WHICH THE TRANSPOSED INTAKES EXCEED THE DIETARY REFERENCE VALUES

	Adults	4-6 years	7-10 years	11-14 years	15-17 years
Copper (mg/d)	5	2	3	4	4
Selenium (µg/d)	300	90	130	200	250
Vitamin A* (µg/d)	3000	1100	1500	2000	2600
Vitamin B6 (mg/d)	25	7	10	15	20

*Retinol and retinol esters

ANNEX 3 ESTIMATED NUTRITIONAL INTAKES IN CHILDREN BY TRANSPOSING THE DIETS IDENTIFIED FROM THE C2 ADULT MALE AND B6 ADULT FEMALE SCENARIOS

		Men	Boys											
			4-6 years			7-10 years			11-14 years			15-17 years		
Nutrient	Unit	Intakes for Scenario C2	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met
Calorie intakes	kcal	2470	1521	1521	**100%**	1851	1851	**100%**	2263	2263	**100%**	2826	2826	**100%**
EPA + DHA	mg	500	250	308	**123%**	250	375	**150%**	250	458	**183%**	250	572	**229%**
Vitamin A*	µg	944	300	581	**194%**	400	707	**177%**	600	865	**144%**	750	1080	**144%**
Vitamin B1	mg	1.4	0.6	0.9	**139%**	0.8	1.1	**139%**	0.9	1.3	**139%**	1.2	1.6	**139%**
Vitamin B2	mg	2.1	0.7	1.3	**185%**	1.0	1.6	**157%**	1.4	1.9	**137%**	1.6	2.4	**150%**
Vitamin B3**	mg	28	10	17	**170%**	12	21	**170%**	15	26	**170%**	19	32	**170%**
Vitamin B5	mg	7.4	4.0	4.6	**114%**	4.0	5.5	**139%**	5.0	6.8	**136%**	5.0	8.5	**169%**
Vitamin B6	mg	2.6	0.7	1.6	**229%**	1.0	1.9	**195%**	1.4	2.4	**170%**	1.7	3.0	**175%**
Vitamin B9***	µg	520	140	320	**229%**	200	390	**195%**	270	476	**176%**	330	595	**180%**
Vitamin B12	µg	6.7	1.5	4.1	**275%**	2.5	5.0	**201%**	3.5	6.1	**175%**	4.0	7.7	**192%**
Vitamin C	mg	193	30	119	**396%**	45	145	**321%**	70	177	**253%**	100	221	**221%**
Vitamin D	µg	4.3	15	2.6	**18%**	15	3.2	**21%**	15	3.9	**26%**	15	4.9	**33%**
Vitamin E	mg	15	9.0	9.2	**103%**	9.0	11	**125%**	13	14	**106%**	13	17	**132%**
Magnesium	mg	444	230	273	**119%**	230	333	**145%**	300	407	**136%**	300	508	**169%**
Phosphorus	mg	1761	440	1084	**246%**	440	1320	**300%**	640	1613	**252%**	640	2015	**315%**
Calcium	mg	1170	800	720	**90%**	800	877	**110%**	1150	1072	**93%**	1150	1339	**116%**
Manganese	mg	5.6	1.0	3.4	**345%**	1.5	4.2	**280%**	2.0	5.1	**257%**	3.0	6.4	**214%**
Iron	mg	14	7.0	8.6	**123%**	11	10	**95%**	11	13	**117%**	11	16	**146%**
Copper	mg	2.3	1.0	1.4	**142%**	1.0	1.7	**172%**	1.3	2.1	**162%**	1.3	2.6	**202%**
Zinc	mg	14	5.5	8.6	**157%**	7.4	10	**142%**	10.7	13	**120%**	14.2	16	**113%**
Selenium	µg	90	20	55	**277%**	35	67	**193%**	55	82	**150%**	70	103	**147%**
Iodine	µg	150	90	92	**103%**	90	112	**125%**	120	137	**115%**	130	172	**132%**
Fibre	g	30	14	18	**132%**	16	22	**141%**	19	27	**145%**	21	34	**163%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol, 6 µg β-carotene, 12 µg provitamin A
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): µg DFE = µg dietary folate + 1.7*µg folic acid

		Women	Girls											
			4-6 years			7-10 years			11-14 years			15-17 years		
Nutrient	Unit	Intakes for Scenario C2	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario C2	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario V2	% DRV met
Calorie intakes	kcal	2470	1417	1417	**100%**	1726	1726	**100%**	2048	2048	**100%**	2253	2253	**100%**
EPA + DHA	mg	500	250	287	**115%**	250	349	**140%**	250	415	**166%**	250	456	**182%**
Vitamin A*	µg	944	300	542	**181%**	400	660	**165%**	600	783	**130%**	650	861	**132%**
Vitamin B1	mg	1.4	0.6	0.8	**139%**	0.7	1.0	**139%**	0.9	1.2	**139%**	0.9	1.3	**139%**
Vitamin B2	mg	2.1	0.7	0.8	**117%**	1.0	1.0	**100%**	1.4	1.2	**85%**	1.6	1.3	**82%**
Vitamin B3**	mg	28	9.5	16	**170%**	12	20	**170%**	14	23	**170%**	15	26	**170%**
Vitamin B5	mg	7.4	4.0	4.2	**106%**	4.0	5.2	**129%**	5.0	6.1	**123%**	5.0	6.7	**135%**
Vitamin B6	mg	2.6	0.7	1.5	**213%**	1.0	1.8	**182%**	1.4	2.2	**154%**	1.6	2.4	**148%**
Vitamin B9***	µg	520	140	298	**213%**	200	363	**182%**	270	431	**160%**	330	474	**144%**
Vitamin B12	µg	6.7	1.5	3.8	**256%**	2.5	4.7	**187%**	3.5	5.6	**159%**	4.0	6.1	**153%**
Vitamin C	mg	193	30	111	**369%**	45	135	**300%**	70	160	**229%**	110	176	**160%**
Vitamin D	µg	4.3	15	2.5	**16%**	15	3.0	**20%**	15	3.6	**24%**	15	3.9	**26%**
Vitamin E	mg	15	9	8.6	**96%**	9	10	**116%**	11	12	**113%**	11	14	**124%**
Magnesium	mg	444	230	255	**111%**	250	310	**124%**	250	368	**147%**	250	405	**162%**
Phosphorus	mg	1761	440	1010	**230%**	440	1231	**280%**	640	1460	**228%**	640	1606	**251%**
Calcium	mg	1170	800	671	**84%**	800	818	**102%**	1150	970	**84%**	1150	1067	**93%**
Manganese	mg	5.6	1.0	3.2	**321%**	1.5	3.9	**261%**	2	4.6	**232%**	3	5.1	**170%**
Iron	mg	14	7	8	**115%**	11	10	**89%**	11	12	**106%**	11	13	**116%**
Copper	mg	2.3	1.0	1.1	**110%**	1	1.6	**161%**	1.1	1.9	**173%**	1.1	2.1	**191%**
Zinc	mg	14	5.5	8.0	**146%**	7.4	10	**132%**	10.7	12	**108%**	11.9	13	**107%**
Selenium	µg	90	20	52	**258%**	35	63	**180%**	55	75	**136%**	70	82	**117%**
Iodine	µg	150	90	86	**96%**	90	105	**116%**	120	124	**104%**	130	137	**105%**
Fibre	g	30	14	17	**123%**	16	21	**131%**	19	25	**131%**	21	27	**130%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol, 6 µg β-carotene, 12 µg provitamin A
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): µg DFE = µg dietary folate + 1.7*µg folic acid

		Men	Boys											
			4-6 years			7-10 years			11-14 years			15-17 years		
Nutrient	Unit	Intakes for Scenario B6	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B2	% DRV met
Calorie intakes	kcal	2123	1521	1521	**100%**	1851	1851	**100%**	2263	2263	**100%**	2826	2826	**100%**
EPA + DHA	mg	500	250	358	**143%**	250	436	**174%**	250	533	**213%**	250	666	**266%**
Vitamin A*	µg	809.0	300	580	**193%**	400	705	**176%**	600	862	**144%**	750	1077	**144%**
Vitamin B1	mg	1.3	0.6	0.9	**141%**	0.8	1.1	**141%**	0.9	1.3	**141%**	1.2	1.7	**141%**
Vitamin B2	mg	2.0	0.7	1.4	**206%**	1.0	1.8	**176%**	1.4	2.1	**154%**	1.6	2.7	**168%**
Vitamin B3**	mg	17.8	10	13	**125%**	12	16	**125%**	15	19	**125%**	19	24	**125%**
Vitamin B5	mg	6.1	4.0	4.4	**109%**	4.0	5.3	**133%**	5.0	6.5	**130%**	5	8.1	**162%**
Vitamin B6	mg	2.1	0.7	1.5	**215%**	1.0	1.8	**183%**	1.4	2.2	**160%**	1.7	2.8	**164%**
Vitamin B9***	µg	417	140	299	**213%**	200	364	**182%**	270	444	**165%**	330	555	**168%**
Vitamin B12	µg	5.6	1.5	4.0	**267%**	2.5	4.9	**195%**	3.5	6.0	**171%**	4.0	7.5	**186%**
Vitamin C	mg	110	30	79	**263%**	45	96	**213%**	70	117	**168%**	100	146	**146%**
Vitamin D	µg	3.5	15	2.5	**17%**	15	3.1	**20%**	15	3.7	**25%**	15	4.7	**31%**
Vitamin E	mg	14.0	9	10	**111%**	9	12	**136%**	13	15	**115%**	13	19	**143%**
Magnesium	mg	403.0	230	289	**126%**	230	351	**153%**	300	430	**143%**	300	536	**179%**
Phosphorus	mg	1589	440	1138	**259%**	440	1385	**315%**	640	1694	**265%**	640	2115	**330%**
Calcium	mg	1095	800	785	**98%**	800	955	**119%**	1150	1167	**101%**	1150	1458	**127%**
Manganese	mg	4.9	1.0	3.5	**351%**	1.5	4.3	**285%**	2.0	5.2	**261%**	3.0	6.5	**217%**
Iron	mg	12	7.0	8.6	**123%**	11	10	**95%**	11	13	**116%**	11	16	**145%**
Copper	mg	2	1.0	1.4	**143%**	1.0	1.7	**174%**	1.3	2.1	**164%**	1.3	2.7	**205%**
Zinc	mg	11	5.5	7.9	**143%**	7.4	9.6	**130%**	10.7	12	**110%**	14.2	15	**103%**
Selenium	µg	78	20	56	**279%**	35	68	**194%**	55	83	**151%**	70	104	**148%**
Iodine	µg	150	90	107	**119%**	90	131	**145%**	120	160	**133%**	130	200	**154%**
Fibre	g	26	14	19	**133%**	16	23	**142%**	19	28	**146%**	21	35	**165%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol, 6 µg β-carotene, 12 µg provitamin A
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): µg DFE = µg dietary folate + 1.7*µg folic acid

		Women	Girls											
			4-6 years			7-10 years			11-14 years			15-17 years		
Nutrient	Unit	Intakes for Scenario B6	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met	DRV (EFSA 2017)	Simulated intakes Scenario B6	% DRV met
Calorie intakes	kcal	2123	1417	1417	**100%**	1726	1726	**100%**	2048	2048	**100%**	2253	2253	**100%**
EPA + DHA	mg	500	250	334	**133%**	250	407	**163%**	500	482	**193%**	500	531	**212%**
Vitamin A*	µg	809.0	300	540	**180%**	400	658	**164%**	600	780	**130%**	650	859	**132%**
Vitamin B1	mg	1.3	0.6	0.8	**143%**	0.7	1.0	**143%**	0.9	1.2	**143%**	0.9	1.3	**143%**
Vitamin B2	mg	2.0	0.7	1.3	**191%**	1.0	1.6	**163%**	1.4	1.9	**138%**	1.6	2.1	**133%**
Vitamin B3**	mg	17.8	0.7	12	**125%**	12	14	**125%**	14	17	**125%**	15	19	**125%**
Vitamin B5	mg	6.1	4.0	4.1	**102%**	4.0	5.0	**124%**	5.0	5.9	**118%**	5.0	6.5	**129%**
Vitamin B6	mg	2.1	0.7	1.4	**200%**	1.0	1.7	**171%**	1.4	2.0	**145%**	1.6	2.2	**139%**
Vitamin B9***	µg	417	140	278	**199%**	200	339	**170%**	270	402	**149%**	330	443	**134%**
Vitamin B12	µg	5.6	1.5	3.7	**249%**	2.5	4.6	**182%**	3.5	5.4	**154%**	4.0	5.9	**149%**
Vitamin C	mg	110	30	73	**245%**	45	89	**199%**	70	106	**152%**	100	117	**106%**
Vitamin D	µg	3.5	15	2.3	**16%**	15	2.8	**19%**	15	3.4	**23%**	15	3.7	**25%**
Vitamin E	mg	14.0	9.0	9.3	**104%**	9.0	11	**126%**	11	14	**123%**	11	15	**135%**
Magnesium	mg	403.0	230	269	**117%**	250	328	**131%**	250	389	**156%**	250	428	**171%**
Phosphorus	mg	1589	440	1061	**241%**	440	1292	**294%**	640	1533	**240%**	640	1686	**263%**
Calcium	mg	1095	800	731	**91%**	800	890	**111%**	1150	1056	**92%**	1150	1162	**98%**
Manganese	mg	4.9	1.0	3.3	**327%**	1.5	4.0	**266%**	2.0	4.7	**236%**	3.0	5.2	**101%**
Iron	mg	12	7.0	8.0	**114%**	11	10	**89%**	11	12	**105%**	11	13	**116%**
Copper	mg	2.0	1.0	1.3	**133%**	1.0	1.6	**163%**	1.1	1.9	**175%**	1.1	2.1	**193%**
Zinc	mg	11	5.5	7.3	**133%**	7.4	8.9	**121%**	10.7	11	**99%**	11.9	12	**98%**
Selenium	µg	78	20	52	**260%**	35	63	**181%**	55	75	**137%**	70	83	**118%**
Iodine	µg	150	90	100	**111%**	90	122	**136%**	120	145	**121%**	130	159	**122%**
Fibre	g	26	14	17	**124%**	16	21	**132%**	19	25	**132%**	21	28	**131%**

* Retinol equivalent (RE): 1 µg RE = 1 µg retinol, 6 µg β-carotene, 12 µg provitamin A
** Niacin equivalent (NE): 1 mg niacin = 1 NE = 60 mg dietary tryptophan
*** Dietary Folate Equivalent (DFE): µg DFE = µg dietary folate + 1.7*µg folic acid

ANNEX 4 ANALYSIS AND CONCLUSIONS OF THE CES BIORISK ON RECOMMENDATIONS FOR THE PREVENTION OF FOODBORNE MICROBIOLOGICAL RISKS FOR SPECIFIC POPULATIONS

The prevention of foodborne diseases by consumers requires three types of measures (ANSES, 2015, 2014, 2013):

- prevention of cross-contamination: hand-washing, cleaning of surfaces, equipment and utensils, separation of raw and cooked food;
- application of specific measures to inactivate micro-organisms or prevent them from multiplying: refrigeration, freezing, cooking, decontamination;
- the exclusion of some foods for certain categories of the population.

1. Recommendations on prevention intended for the general population

Measures enabling consumers to prevent and control the main foodborne microbial hazards are described in the ANSES biological hazard sheets and summarised in Table 1.

Table 1: Main measures enabling consumers to prevent foodborne microbiological risks

Foods concerned	Main recommendations to consumers
All	○ Wash hands (after going to the toilet, before and during food preparation, before eating meals, after contact with animals, etc.). ○ People with gastroenteritis symptoms should avoid preparing meals for others. ○ Regularly clean work surfaces, equipment and utensils. ○ Refrigerator hygiene: surfaces should be cleaned whenever food has soiled them. ○ Comply with the cold chain: maintain a maximum temperature of 4°C in the coldest part of the refrigerator and check the seal on its doors. ○ Comply with the use-by date (UBD) for packaged products and rapidly consume (within three days of purchase) retail foods sold without a stated UBD. ○ Quickly refrigerate cooked dishes (resting time at room temperature < 2h). ○ Separate raw and cooked foods: - use a separate cutting board for raw meat and fish, - dishes and utensils used for the seasoning of raw meat or fish should be cleaned before being reused for cooked foods.
Meat and meat products	Cook poultry and red meat thoroughly (> 70°C internal temperature)
Milk and dairy products	Infant formula: - Comply with the rules on preparation and storage of feeding bottles: ○ reduce the time between preparation and consumption to no more than one hour if the product is at room temperature, and 30 minutes if it has been heated, ○ store reconstituted meals/bottles at 4°C and for 48 hours at most. - Preferably use sterile formula in liquid form for infants most susceptible to infection.
Eggs and egg products	Home-made uncooked egg-based preparations (mayonnaise, creams, chocolate mousse, pastries, etc.) should be prepared as close as possible to the time of consumption, kept cool and consumed within 24 hours.
Seafood and freshwater products	Fish - Cook fish thoroughly (65°C) - For lovers of raw fish (sushi, fillets, marinades, carpaccio, etc.): freeze for 7 days in a domestic freezer, gut and clean caught fish rapidly. Shellfish - Avoid consuming shellfish that do not come from authorised and inspected areas of production, or cook them for a prolonged period. - Consume live bivalve shellfish and raw seafood within two hours of being fished/picked or taken out of the refrigerator.
Plants	- Wash fresh produce (fruits, vegetables and herbs) thoroughly, cook foods if washing conditions cannot be applied due to a lack of drinking water. - In countries with low levels of hygiene: avoid consumption of unpasteurised fresh fruit juices.

2. Additional recommendations for susceptible populations

Certain categories of the population are more likely than average to develop symptoms, severe forms or complications of a foodborne infectious disease after exposure to a hazard. These include infants, young children, the elderly, pregnant women, immunocompromised individuals and those suffering from chronic diseases.
These susceptible populations are characterised by an immune system deficiency that may be physiological (in the case of infants, young children, the elderly, pregnant women) or related to a chronic disease or immunosuppressive treatment.
The main infections associated with the populations considered in this request are presented in Table 2.

Table 2: Diseases or complications that may occur in specific populations

Susceptible population groups	Diseases or complications related to foodborne pathogens
Children aged 0-5 years	Neonatal infections related to *Cronobacter* spp. or *Salmonella*. Infant botulism related to *Clostridium botulinum* spores. Haemolytic and uraemic syndrome related to enterohaemorrhagic *E. coli*. Severe dehydration associated with gastroenteritis (*Yersinia*, *Rotavirus*, *Cryptosporidium*).
Children aged 6-10 years	Haemolytic and uraemic syndrome related to enterohaemorrhagic *E. coli*. Yersiniosis.

The exclusion of some foods by susceptible populations reduces the risk of infection. The main foods to be avoided are shown in Table 3.

Table 3: List of foods to be avoided per population category

Population categories	Foods to be avoided
Children aged 0-5 years	Honey (infants under one year of age). All raw or undercooked meat (cook minced meat and minced meat products thoroughly). Raw milk and cheeses made from raw milk (with the exception of hard pressed cheeses such as gruyère or comté). Raw eggs and products containing raw or undercooked eggs. Raw shellfish, raw fish.
Children aged 6-10 years	All raw or undercooked meat (cook minced meat and minced meat products thoroughly). Raw milk and cheeses made from raw milk (with the exception of hard pressed cheeses such as gruyère or comté).

List of expert appraisals consulted

- Foodborne biological hazard data sheets https://www.anses.fr/en/content/microbiological-hazards-files
- ANSES Opinion of 18 December 2015 on a draft decree pursuant to Article L. 214-1 of the French Consumer Code and concerning the labelling of raw milk intended to be provided for direct consumption by the final consumer.https://www.anses.fr/fr/system/files/BIORISK2015SA0114.pdf
- ANSES Opinion and Report of 14 October 2015 relating to consumer information on prevention of foodborne microbiological risks – Volume 2: Assessment of the effectiveness of communication strategies. https://www.anses.fr/fr/system/files/BIORISK2012sa0118Ra-02.pdf
- ANSES Opinion and Report of 9 May 2014 relating to consumer information on prevention of foodborne microbiological hazards – Volume 1: Prioritisation of the hazard-food combinations and review of information measures. https://www.anses.fr/fr/system/files/BIORISK2012sa0118Ra-01.pdf
- ANSES Opinion of 7 February 2013 on the request to re-assess seafood products posing a risk for pregnant women in the PNNS guide "Guide to nutrition during and after pregnancy". https://www.anses.fr/fr/system/files/BIORISK2012sa0102.pdf
- ANSES Opinion of 8 October 2013 on prevention of foodborne microbiological risks by consumers at home: main measures adopted. https://www.anses.fr/fr/system/files/BIORISK2012sa0005.pdf
- Data sheet on foodborne biological hazards: "Domestic hygiene" – October 2013. https://www.anses.fr/fr/system/files/MIC2012sa0005Fi.pdf
- AFSSA. December 2005. Report on Toxoplasmosis: state of knowledge and dietary risk assessment: report of the AFSSA "*Toxoplasma gondii*" Working Group. https://www.anses.fr/fr/system/files/MIC-Ra-Toxoplasmose.pdf
- AFSSA. July 2005. Report on the hygiene recommendations for the preparation and storage of infant feeding bottles. https://www.anses.fr/fr/system/files/MIC-Ra-BIB.pdf

- **Recommendations by hazard considered (source: biological hazard data sheets)**

Name	Susceptible population group	Main foods concerned	Recommendations for consumers	Data sheet version date
Bacteria, toxins or metabolites				
Enterohaemorrhagic *E. coli* (EHEC)	Young children, the elderly	Inadequately cooked minced beef, unpasteurised dairy products, fresh produce (lettuce, spinach; sprouted seeds) unpasteurised products of plant origin (apple juice), contaminated water	– Basic hygiene rules – Thorough washing of produce (fruits and vegetables and herbs), peeling if possible – **For children under 10 years of age and the elderly:** ○ **cook minced meat and minced meat products thoroughly** ○ **do not consume raw milk and cheeses made from raw milk**	Revision 2018
***Salmonella* spp.**	Infants, the elderly, subjects suffering from malnutrition, achlorhydria, hypochlorhydria or a neoplastic disease, or following an antacid treatment, broad-spectrum antibiotherapy or immunosuppressor treatment.	Raw eggs and products made from raw eggs, meat (beef, pork, poultry), dairy products (raw or slightly heat-treated milk)	– Basic hygiene rules – Thorough cooking of meat – Specific measures concerning eggs and preparations containing raw eggs: ○ Eggs should be stored at a stable temperature to avoid condensation on their surface. Under no circumstances should eggs be washed before storage. ○ Uncooked egg-based preparations (mayonnaise, creams, chocolate mousse, pastries, etc.) should be consumed immediately after preparation or kept cool and consumed within 24 hours. **The elderly, immunocompromised people, young children and pregnant women should not eat raw or undercooked eggs**	Revision 2018
Yersinia enterocolitica* / *Y. pseudotuberculosis	*Y. enterocolitica*: children under 10 years of age *Y. pseudotuberculosis*: people over 60 years of age Subjects with iron overload, cirrhosis, diabetes and immunosuppression are predisposed to develop a severe deep-rooted form or sepsis	Pork, raw milk, fresh produce, mixed salads	– Basic hygiene rules – Cook pork thoroughly – Wash vegetables thoroughly – Infected people should avoid handling food	Revision 2018
Viruses				

Name	Susceptible population group	Main foods concerned	Recommendations for consumers	Data sheet version date
Rotavirus	Children under five years of age.	Bivalve shellfish, fresh produce, water, any type of food handled Ready-to eat or undercooked foods	– Basic hygiene rules – Infected subjects should avoid handling food – Wash fresh produce thoroughly – Avoid consuming shellfish that do not come from authorised and inspected areas of production, unless they have been thoroughly cooked	April 2012
Parasites				
***Cryptosporidium* spp.**	Immunocompromised people with bile duct damage Young children:	Water; bivalve shellfish, fruits and vegetables (salads, carrots, radishes, etc.)	– Basic hygiene rules – Wash vegetables thoroughly, cook food if washing conditions cannot be applied due to a lack of drinking water – **Other recommendations, especially for immunocompromised people and young children, and in countries with low levels of hygiene:** do not drink untreated surface water or water from an uncontrolled well or source; avoid consumption of fresh unpasteurised fruit juice, ice whose origin or preparation methods are unsafe, or raw shellfish that do not come from authorised and inspected areas of production	Revision 2018