



# EATING TOGETHER

-food recommendations for families with children

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National Institute for Health and Welfare



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# WORK GROUP AND ACKNOWLEDGEMENTS

*EATING TOGETHER -food recommendations for families with children* replaces the recommendations of the book *Child, Family and Food* published by the Finnish Ministry of Social Affairs and Health in 2004. The new recommendations have been drawn up by an expert group appointed by the Director General of the National Institute for Health and Welfare (THL). The work group worked from spring 2012 until the end of 2015. The work group has heard and consulted a number of experts at different stages of the work on several special issues (e.g. special conditions during pregnancy and folate recommendation, breastfeeding and starting solid foods, children's food allergies and iron status, food safety and nutrition of young athletes). The work has been funded by the National Institute for Health and Welfare and the Ministry of Social Affairs and Health.

The draft text for the recommendations has been reviewed at various stages by the National Nutrition Council (VRN). The Council approved the draft version on 17.8.2015 for an open public commenting procedure, which was implemented in September 2015. A total of 110 comments were received on the draft version, and they were reviewed by the Council before releasing the recommendations for publication on 8.10.2015.

We wish to thank all those who have contributed to the preparation of the recommendations for their considerable input to the work and expert advice.

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# INTRODUCTION

*EATING TOGETHER -food recommendations for families with children* presents new national dietary recommendations for children, families with children, and pregnant and lactating women. The recommendations are based on the Nordic population-level nutrition recommendations issued in 2013 and the corresponding Finnish recommendations issued in 2014, as well as on the scientific evidence that has since become available regarding the link between the diet and health. The content of the recommendations has also been influenced by our own culture and particularly by the foods we are accustomed to.

The recommendations describe the principle of a balanced and health promoting diet as well as ways in which it can be executed in families with children during pregnancy, breastfeeding and the early childhood growth period. The recommendations serve as a source of information for all professionals whose work involves nutritional issues related to children, pregnant and lactating women, and families with children. Pursuant to the Decree on maternity and child health clinic services, school and student health services and preventive oral health services for children and youth (338/2011), nutrition and weight management are topics that should be taken into consideration in all health advice services.

The recommendations cover the whole issue of eating in families with children, including the children's meals in day care and schools. The quality of the food provided to children in day care and at school should be verified by requiring that the food provided by the service providers conforms to the nutrition recommendations and the specified quality criteria are fulfilled. The revised Act on early childhood education and care adopted on 1 August 2015 specifies that healthy food that meets the nutritional needs of the children shall be provided to the children. Meals shall be appropriately organised and supervised. The Basic Education Act (628/1998) also requires that appropriately organised, supervised and balanced meals are provided to the pupils. Mealtimes are part of the education provided at school as specified in the curriculum.

## Food as part of lifestyle guidance provided to families

The mother's nutritional status at the beginning and during pregnancy as well as the child's nutrition during the first years have an essential effect on the later health of the individual. The foetal period and the first few months of the infant are a particularly sensitive time in terms of environmental influences, because the organs are developing and growing rapidly during that time. The building materials available for development and growth may have a permanent effect on the structures, functions and metabolism of the body.

Taste preferences and habits also develop at an early age and remain unchanged till adulthood, making childhood the critical period to influence them. Children imitate adults; the adult's values and attitudes towards food as well as the mutual interaction between the adult and the child at mealtime affect the child's relationship with food later in life.

These recommendations are applicable to all healthy children and adults, pregnant women undergoing a normal pregnancy, and infants born with a normal weight. Recommendations for special conditions are also included, for gestational diabetes and some special diets, for example. What is new about the recommendations is that children's eating is reviewed until the upper classes of basic education and upper secondary education. The nutrition of adolescents as well as children and young people engaged in sports are new topics of the recommendations, as is also the implementation of a vegan diet.

The new recommendations lay more emphasis on food education and the importance of developing a healthy diet for the whole family already before pregnancy. When health-promoting eating habits have already been learned, it is easy to ensure that the nutritional status of the mother remains good throughout pregnancy and breastfeeding. It will also be easy for the child to later adopt the family's healthy diet and eat the same foods as the rest of the family from the very beginning.

Compared with previous recommendations, changes have been made in the recommended intake of vitamin D and iron. The most recent research data on starting solid foods and transferring the baby from breast milk to the family's normal diet have also influenced the recommendations. In addition to the quality of fat, attention is in the recommendations also paid to the sources of carbohydrates and protein.




Health-promoting diets can vary a lot in composition. Despite different food-stuffs, however, a health-promoting diet built on the same basic elements is suited for the whole family, from infants to adults. The important thing is that the diet is balanced, the meal schedule is regular and the quantity of food corresponds to the expenditure of energy.

Like the nutrition recommendations designed for the whole population, these recommendations also incorporate exercise recommendations as well, to remind about the common and mutually supporting effects that nutrition and exercise have on health and well-being. An active lifestyle as well as a regular sleep and meal schedule are learned at an early age through repetition and imitation of adults. Engaging in physical activity together with the child and ensuring a regular sleep and meal schedule will promote the well-being of all family members.

## How to read the recommendations

A summary of the most important points is presented at the beginning of each Chapter for quick revision. The Tips to families sections can be used as tools in health guidance provided to families. They present examples for practical implementation of health-promoting food choices. The tips are indicative only, not exhaustive. They can be utilised to demonstrate the variety of ingredients that can be chosen to compose healthy meals and snacks suitable for each individual family. The recommendations also stress more than before the aspect of food education and provide tools for supporting children, when they learn how to eat.

Annex Tables 1-7 provide detailed information for various situations. Annex Table 1 presents guidelines related to the safe use of foods. Reference energy expenditure values by age and gender groups are provided in Annex Tables 4 a-c. Tables 6 and 7 present the recommended intakes of vitamins and minerals.

Beneficial health effects are pointed out in the text to support health guidance; they are indicated with a small .



# FOOD AS PART OF LIFESTYLE

### **GOOD EATING HABITS OF A FAMILY ARE PROMOTED BY**

- ▶ reserving time and adjusting daily schedules for family meals eaten together
- ▶ eating at regular intervals, and
- ▶ varied and healthy foodstuffs.

## **1.1 Eating together**

The food culture lives and changes as part of the social change, which is also reflected in the eating habits of children and families. The family is the most important environment in the development of a child, and the resources of the family are significant to the health and well-being of all family members.

Dietary guidance takes account of the diversity of families, the basis of their food culture, values and attitudes, as well as their knowledge and skills regarding food preparation and nutrition, and the family as an entity. It is important to appreciate the role of eating at home as an everyday asset that unites the family, and to together seek practical solutions to realise a good diet.

A good diet can be composed in many different ways. The end-result can be as good and healthy regardless of whether prepared at home from scratch, or using semi-processed foods or ready-made meals.

In Finland, the meals provided to children in the early childhood education and care system and in the school system level out nutritional differences resulting from the family backgrounds of the children; this promotes equality in health. Studies show that families with children follow a healthier diet on weekdays than during weekends. Regular mealtimes and complete main meals also during the weekends would improve the nutrition of children from the present situation.



## WELL-BEING OF FAMILIES WITH CHILDREN

- The majority of Finnish families with children are doing well, with only a small minority suffering from malaise.
- Poverty has tripled among families with children since the years of depression in the 1990's, and single-parent families and families with multiple children, in particular, are experiencing economic hardship.
- In working families the parents may feel deprived of time, and concern for their ability to cope as parents.
- Immigrant families are faced with the challenge of combining the eating habits of their own culture with the Finnish food culture introduced to their children in day care and at school.

## 1.2 Learning of well-being as a child

The eating habits of a family are part of the holistic learning of well-being which covers daily schedules and use of time, sleep, rest, management of screen time and physical activity. For children, good day-to-day life is based on the child being cared for, and regular meals are one element of mental, social and physical well-being. Learning of well-being encompasses also interactive skills, social competence, the food environment, recognition of messages sent by the body and the mind, and the interpretation and expression of these messages. Learning of well-being is a lifelong process.

For small babies, hunger is a powerful feeling which they experience as pain. When the hunger cues are responded to by giving food to the baby, it creates the earliest sensation of security for the child. The feeling of fundamental security is also later strengthened in children by regular mealtimes and meeting their needs related to eating. Indeed,

for children the first experiences in learning of well-being are closely related to food. The warm interactive relationship between the parent and the child at mealtimes helps the child build a positive self-image as an eater and prevents the development of problems related to eating.

The perception that the parents have of themselves and their own skills as competent and capable parents is an essential part of parenthood. Starting already during pregnancy, when the mother is preparing for breastfeeding, the public health nurse must support the mother in recognising herself as capable of being responsible for the child's eating.

The eating culture of each family is created during the toddler years of the child. Eating habits that support well-being and health are not just a question of selecting foodstuffs and preparation methods. A factor that also affects the eating experience is how

the family appreciates eating as part of their day-to-day life and their own well-being. Positive mealtime experiences, inclusion and the feeling of joy produced by food contribute to the favourable development of the child's eating habits. Children need encouragement and positive feedback showing that their progress is noticed, however little it may be. Early experiences affect the practices, habits, taste preferences, values, attitudes and food-related self-esteem that the child develops. Child-oriented eating habits in a family refer to the understanding of the child's developmental needs. It is important that parents are aware of the age-specific objectives in children's eating (reference table 2, p. 118) and know what kind of boundaries need to be set to the child's activities based on the developmental level of the child.

Using food to reward, comfort or threaten will easily result in problems in eating behaviour.



## TIPS TO FAMILIES

### CHILDREN SHOULD BE BOTH SEEN AND HEARD AT MEALTIME!

- Involve the child in the preparation of the meal.
- Give positive feedback on the good aspects of the child's eating.
- Being together is the most important thing – be there for the child.
- Pay attention to where you eat – together at the table or alone in front of the television.
- Do not use mealtimes as a reward or a punishment.
- How you act as a role model is more important than what you say.

## 1.3 Multiculturalism

Food is an important expression of own identity in all cultures. It should be remembered that the food pyramid or plate model that are familiar to Finnish people are not self-explanatory to very many people raised in a different culture, or to Finns either, for that matter, without some guidance.

The eating habits of immigrant families change when they move into a new country. At first, the changes in the selection of available foodstuffs, handling and preparation of food, daily schedule and associated mealtimes, as well as in the whole way of life may feel confusing. The diet may be limited to just foods known to the family from before, such as high-fat fast food, biscuits, soft drinks and fruit juices. Language problems and labelling of food products cause difficulties to the family members responsible for buying and preparing food. Stomach upsets from constipation to diarrhoea, lactose intolerance, lack of appetite and craving of familiar comfort foods are quite common in immigrant families.

In public health clinic work, habits and strong beliefs regarding pregnancy, motherhood and early childhood may pose a special challenge. Mothers may be in contact with relatives living in their old home country or some other country and follow their instructions, which may be appropriate in that country, but not necessarily in their new home country. Many families lack the natural support network which is important for breastfeeding and childcare. Eating restrictions based on religion are specified within the own community, making peer support from within the community vital for guidance related to such restrictions. The Ramadan fasting month observed by Muslims, for example, with no food or water consumed between sunrise and sunset, does not apply to pregnant and breastfeeding women, children, the elderly or the sick.

Guidance related to motherhood, childcare and nutrition requires in the new home country co-operation between the organisations responsible for immigrant integration, associations, health care, social services, day care, education and food services. Nutrition recommendations can only be understood and implemented in practice, if the nutritional content of foods is known; this can be strengthened by means of practical pictures, guided shopping and preparation of food and eating, and discussion groups in the immigrants' own language.

The objective is to have people who live in Finland also observe the principles of the recommendations drawn up for Finland with respect to both eating and use of vitamin and mineral supplements. The food recommendations for families with children are based on the Finnish selection of foodstuffs and Finnish basic foods, and the required supplements have been specified on the basis of Finnish conditions. Daily vitamin D supplementation is in Finland recommended all year round to all pregnant and lactating women, children under 18 years of age and people who do not on a regular basis use products fortified with vitamin D or eat fish.

A meal based on the plate model can comprise either cooked or uncooked vegetables – in many food cultures vegetables are always cooked.



*FIGURE 1. A balanced meal that suits everybody can be composed in many different ways. The meal can be served on a plate, as stuffed bread or wrapped in a pancake. Each meal shall consist of three different food groups, in equal parts: cooked vegetables (stew or sauce), food containing protein in the form of meat, fish, yogurt or legumes, and a meal base containing carbohydrates (e.g. cornmeal or millet meal, rice or bread). Fresh fruit, nuts and almonds are good as snacks or to supplement a meal.*



# HEALTH-PROMOTING EATING HABITS FOR THE WHOLE FAMILY



## MAIN POINTS

- ▶ The overall eating pattern and good every-day choices are in key position.
- ▶ A regular meal schedule is the foundation of healthy eating, for both children and adults.
- ▶ Shared meals promote the health of the whole family.
- ▶ Vegetables, fruit or berries are eaten at every meal.
- ▶ Cereals are mainly eaten in the form of whole grain products high in fibre.
- ▶ Dairy products are fat-free or low-fat products.
- ▶ Fish is eaten at least 2–3 times a week.
- ▶ Vegetable oils and vegetable oil-based fats are consumed daily.
- ▶ Water is the best primary beverage.
- ▶ Sugar is eaten sparingly.
- ▶ Salt intake is restricted.
- ▶ Red meat, sausages and meat products are not eaten on a daily basis.

## 2.1 Regular meal schedule

Regular eating is the foundation of a health-promoting diet. Small children need food frequently, because they cannot eat large quantities at a time. Long intervals between meals can result in uncontrolled eating and unnecessary snacking, and thus cause overweight. The recommendation is that both children and adults should eat every 3–4 hours, which translates into ca. 4–6 meals a day. Children are provided with regular meals in day care and schools, and it is advisable to follow the same schedule also at home, both on weekdays

and holidays. Adults should eat at regular intervals also in shift work, although the meals follow a different schedule then. A regular meal schedule will help keep the diet balanced and portion sizes moderate. A child should not be left alone at the meal time; an adult should be present, even if only the child is eating.



FIGURE 2. Mealtime clock – regular eating, flexible meals.  
The order of meals varies according to the needs of the families.



## TIPS TO FAMILIES

### MEAL SCHEDULE:

- If the family only eats one meal on a holiday instead of both lunch and dinner, offer snacks to the children according to the schedule they are used to.
- If the dinner is delayed on a weekday, children can be offered snacks of root vegetables or vegetables, for example, to ease their restlessness before a meal.



## 2.2 Health-promoting eating habits

A health-promoting diet is recommended for the whole family, regardless of age. The parents act as examples to their children as they experiment with new tastes and foods. The whole family can eat the same food, but the portion size varies according to the energy expenditure of each family member. Children can self-regulate their portion size, but they should be offered food more frequently than adults, and that is why the quality of snacks is important.

**T** *A health-promoting diet from early childhood maintains well-being and reduces the risk of several diseases, such as coronary diseases and type 2 diabetes, as well as obesity also in adulthood.*

Individual food choices do not make a healthy or unhealthy diet; the overall dietary pattern is what matters. Health-promoting eating habits are based on plant products, i.e. whole grains, vegetables, berries and fruit, and also include fish, fish oils and other soft fats, such as nuts and seeds, as well as fat-free and low fat dairy products. A balanced overall diet also encompasses a moderate amount of poultry and some red meat. A diet like this is rich in vitamins, minerals and fibre, and contains good-quality carbohydrates, fats and proteins in suitable proportions. Table 1 presents examples of health-promoting diet choices.

When implemented on a balanced basis, ovo-lacto and lacto vegetarian diets provide an as good nutrient content as the mixed diet. They are suited for the whole family, including pregnant women and children. As far as the vegan diet is concerned, more careful planning is needed to ensure that the diet is balanced. (Cf. Chapter 8.1).



TABLE 1. Promoting health through dietary choices

Add	Replace	Cut back on
Vegetables, including mushrooms, berries, fruit	Low-fibre grains with whole grains	Sugar
Oil, nuts, seeds, almonds, mushrooms	Butter and butter-based spreads with vegetable margarine or oil. High-fat dairy products with fat-free or low-fat products.	Animal fat, coconut oil and palm oil
Fish Peas, beans, lentils	Red meat partly with poultry. Animal protein partly with plant protein.	Red meat, deli meats and sausages made from red meat
	High-salt products with low-salt products: bread, cheese, deli meats. Non-iodised salt with iodised salt.	Salt



## 2.3 Food choices from different food groups for the whole family

### *Vegetables, fruit and berries – the foundation of the diet*

Vegetables, berries and fruit constitute the foundation of the diet and are served at every meal. For adults this translates into about 500 g, or 5–6 servings every day (1 serving = 1 palm-sized portion). To eat 500 g may seem like a high target, but can easily be achieved when vegetables, fruit or berries are served at every meal. Children should eat at least half the amount recommended for adults, for example 5 serving of their own palm size per day. The portion size increases as the child grows older. Vegetables are not to be replaced with vitamin and mineral preparations, because studies show that their health benefits do not equal those of a diet that contains plenty of vegetables.

**i** Corresponding recommendations by food groups during pregnancy and breast-feeding are presented in Chapters 3–4 in parts, where they differ from the normal recommendations for adults.



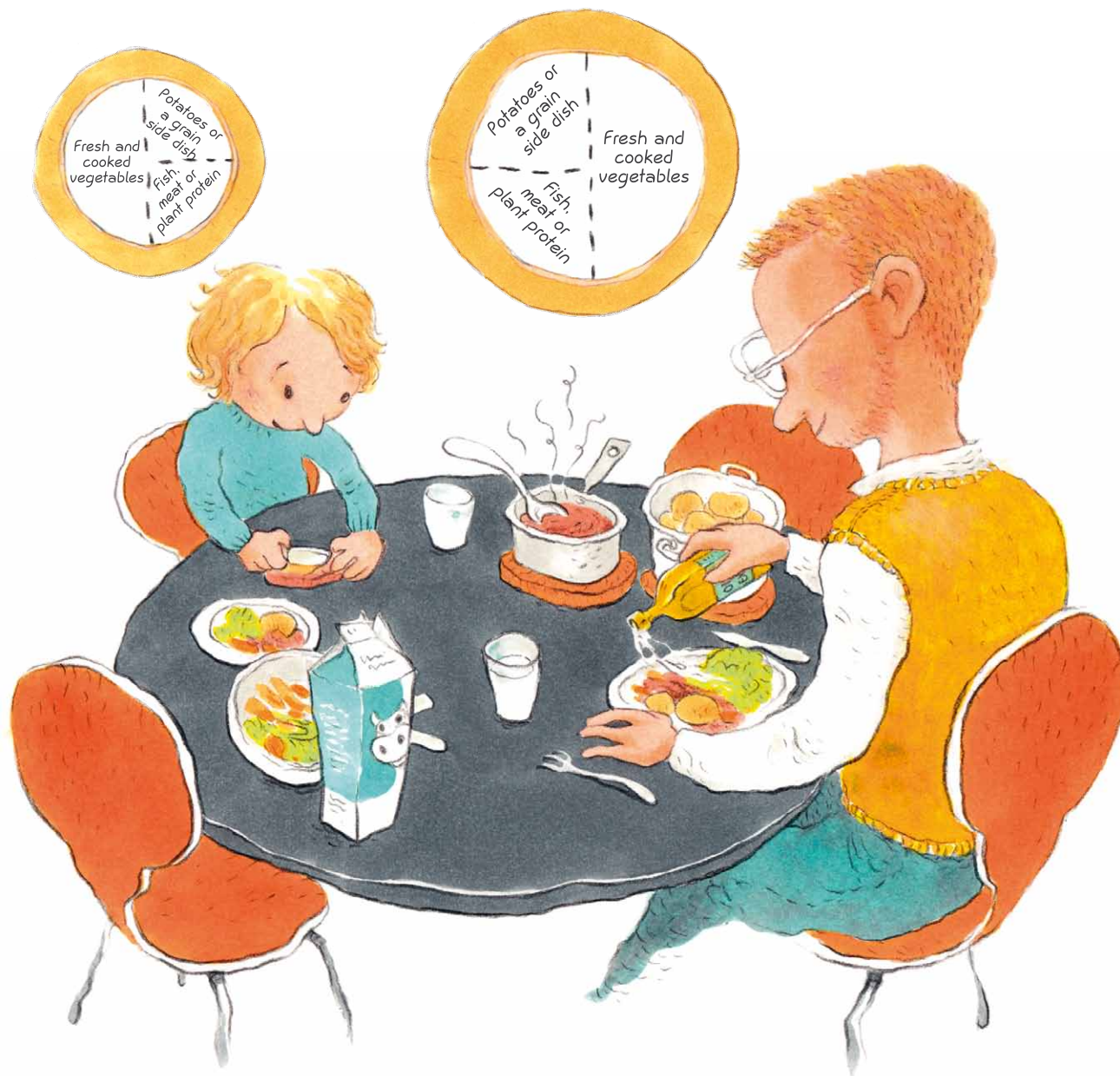
In a diet lacking in vegetables, the addition of just one serving will bring health benefits.



**T** People who follow a vegetable-based diet are less overweight, have better liver function values and lower blood pressure, as well as less cardiovascular diseases and type 2 diabetes than the rest of the population.

### *Potato*

Potato is a good foodstuff from the point of view of both the environment and nutrition, as it contains a moderate amount of carbohydrates and several minerals (e.g. potassium and magnesium) as well as vitamin C. Boiled potatoes are a good choice for weekday meals in families with children. Potato foods and processed potato products that are high in fat should only be used on a random basis. Children should be offered a versatile choice of potatoes, vegetables, berries and fruit.



*FIGURE 3. From a shared pot, to each according to their energy expenditure. The plate model serves as a tool to composing a balanced meal for both children and adults, supplemented with whole grain bread and a suitable beverage.*

## Grain products and grain-based side dishes

With grain products, the daily recommendation is about 6 servings to women, 9 servings to men and at least 4 servings to toddlers. One serving refers to ca. 1 dl of cooked pasta, rice or meal, or one slice of bread. The number of servings depends on the age and energy expenditure of the child. The average energy expenditure consumption of adolescents is higher than that of adults, and increases according to physical activity, in particular. Whole grain alternatives low in salt should be favoured as grain products.

Most of the fibre and nutrient content of grains is found in the outer cell layers and germs of the grain, which is why whole grain products are a good source of fibre, vitamin E, folate, thiamine, niacin, phosphorus, copper, magnesium, iron, selenium and zinc. Particularly in a vegetarian diet, cereals also act as an important source of protein. If most of the grain consumed by the family comes from organic products, it should be borne in mind that their selenium content is lower than that of regular grain.

The long-term health benefits of whole grain cereals are most of all based on their fibre content. The recommended daily fibre intake is at least 25 grams for women and 35 grams for men. The fibre intake of children of 2–5 years of age should be 10–15 g/day and for 6–9 year olds 15–20 g/day (2–3 g/MJ). In adolescence, the recommended fibre intake increases to the adult level of at least 25–35 g/day (3 g/MJ).

**T** *Studies indicate that fibre can protect against type 2 diabetes, coronary disease and colon cancer. Fibre reduces the level of bad LDL cholesterol in blood, promotes bowel regularity and prevents constipation. It also provides long-term satiety making weight control easier. Fibre slows down the emptying of the stomach and the absorption of carbohydrates. After a meal that is rich in fibre, blood sugar rises less and at a slower rate than after a meal that contains less fibre, and remains more stable between meals. Rye fibre has a favourable effect on insulin response.*



## TIPS TO FAMILIES

### LEARNING ABOUT VEGETABLES:

- Serve vegetables to children in a form that they find interesting and in recognisable pieces.
- Use colour theme days to encourage children to familiarise themselves with vegetables of different colours.
- Let the children choose themselves the products that they like in the fruit and vegetable section of the store.
- Let the children participate in the preparation of salads and grated vegetables.
- Favour vegetables of different colours, both fresh and cooked, because different vegetables contain different beneficial compounds. Boiled potatoes are a good choice for a side dish.
- By choosing vegetables and berries that are in season you will get the best culinary experiences, be environmental responsible and save money.



## TIPS TO FAMILIES

### INCREASING FIBRE INTAKE:

- The best sources of fibre include whole grain products, such as whole grain bread, meals, muesli, and breakfast cereals.
- Choose a high-fibre bread with a fibre content of at least 6 g / 100 g.
- Instead of white rice, favour pearled grain as well as whole and broken groats, e.g. whole grain rice, a mixture of rye, oats, barley, and rice as well as barley and spelt.
- Oven-cooked barley porridge is an easy and tasty alternative for the second main meal of the day.
- There are also other good whole grain products in addition to the traditional grains, such as buckwheat, millet, teff, quinoa, kamut and amaranth.

### Dairy products

From school age onwards, the recommended daily intake of dairy products is the same for the whole family; 5–6 dl of liquid milk products and 2–3 slices of cheese. For toddlers, 4 dl of liquid milk products add 1 slice of cheese are adequate as the daily intake. This much dairy products (milk, buttermilk and other fermented milk products) is needed to ensure an adequate intake of calcium and iodine (Annex Table 6a-b). Milk products are naturally rich in good-quality protein, riboflavin, vitamin B12 and zinc. Dairy products provide an easy way to ensure protein intake in a vegetarian diet. Two thirds of the fat contained in milk is hard fat, and it is therefore advisable to choose low-fat and fat-free milk products. The fat content of milk, yogurt and other fermented milk products (buttermilk, “viili”) should not exceed 1%, and as far as cheese is concerned, products with less salt and at most 17% of fat should be chosen. Attention should also be paid to the amount of sugar added in the dairy products.

Check from the labelling,  
if the dairy product has been fortified  
with vitamin D.

Organic milk and raw milk, as well as milk products produced in other countries, are not fortified with vitamin D. The iodine content of organic milk is equal to that of regular milk.

**T** Based on studies, the consumption of low-fat and fat-free dairy products is linked with better weight management and a lower risk for type 2 diabetes. Low-fat dairy products also have a beneficial effect on blood pressure.





If you replace milk with corresponding vegetable-based drinks, check their content of calcium, iodine and vitamin D, as these vary from one producer to another.



On average, protein intake is adequate in Finland and there is no specific need to use dairy products with added protein. High-protein milk preparations and drinks are not recommended to children for daily consumption. Excessive protein intake may add stress to the kidneys in both children and adults. Protein will not increase muscle mass either, if the amount of energy obtained from food does not cover the expenditure of energy.

### *Meat, fish, eggs and legumes*

In addition to milk, also meat, fish, eggs and legumes are good sources of protein. They are often also sources of fat, and attention should therefore be paid to the quantity and quality of fat obtained from them. Fish fat is the best alternative in terms of health. Poultry – chicken and turkey – have a low fat content without the skin, and the quality of their fat is also better than the fat of beef, lamb or mutton.

One decilitre of cooked beans equals one portion of protein for adults and teenagers. According to recommendations, legumes should be used as the source of protein at one main meal every week. The recommended consumption of fish is at least 2–3 times a week for the whole family, varying the fish species. White poultry meat should be eaten at least 2–3 times a week, red meat less frequently.

◆ Excessive intake of animal protein is linked with an increased risk of type 2 diabetes, and in children with obesity.

The recommended weekly consumption of cooked red meat (beef, lamb, mutton and pork), including sausages and deli meats, is at most 500 g for adults (equals a raw weight of 700–750 g). For toddlers the recommended amount is about half of the adult's consumption. Meat products as low in fat and salt as possible should be favoured. Red meat, sausages and deli meats are not part of the daily diet.

Egg contains many nutrients, but egg yolk also contains a lot of cholesterol. Due to genetic factors, some Finnish people absorb cholesterol from food more effectively than other Western people. Because of this, a recommendation of a weekly consumption of at most 2–3 eggs has been issued, particularly for people with elevated cholesterol levels or a family tendency to high cholesterol. The health care professional should determine the family status so as to provide personalised guidance.



Checking the labelling for fat and salt levels gets you a long way.

With ready-made meals, choose those with a fat content of less than 5 g / 100 g and a salt content of no more than 0.8 g / 100 g.



The Heart Symbol is in Finland granted to food products that represent a better alternative in their own product group in terms of the quantity and quality of fat as well as sugar, salt and fibre.



## TIPS TO FAMILIES

### INCREASE VARIETY OF MAIN MEALS WITH VEGETABLES:

- Supplement warm foods with vegetables.
- Add vegetarian foods on the weekly menu.
- Choose vegetables and vegetable spreads for sandwich toppings.
- Meat can be replaced with various bean, pea, broad bean, seed and soy products, such as groats, cubes, tofu and tempeh, as well as lentils.
- Favour fish, chicken and vegetarian foods.
- Cut back on eating foods made from sausages and fatty meat and prepare food from low-fat meat products, such as lean (<10%) ground beef.
- Choose low-fat meat and deli meats: chicken, turkey, ham and other whole meat products (fat content max. 4% and salt max. 1.8%).



Coconut and palm oil are high in saturated fat, and products containing these oils (e.g. cookies, breakfast cereals and crisps) should not be consumed on a daily basis.



### *Vegetable oils and margarines, nuts and seeds*

Vegetable oils and margarines are rich in soft fat (unsaturated fatty acids) and should therefore be used as the source of visible fat in the diet. The recommended daily amount of visible fat in the diet is 2–3 Tbsp. of vegetable oil or 6–8 tsp. of vegetable margarine for adults and school-aged children. For toddlers, 20–30 g (1.5–2 Tbsp. of vegetable oil or 4–6 tsp. of vegetable margarine) is an adequate amount of visible fat. Vegetable margarines with a fat content of at least 60% should always be used as spread on bread.

Nuts, almonds and seeds are good sources of unsaturated fat and fibre, as is also avocado which is a fruit. Nuts, almonds and seeds (such as sunflower, sesame, flax, pine and pumpkin seeds) can be consumed in an amount of about 30 g every day, or 200 g per week, varying the species, as long as they are not covered with salt, sugar or anything other than their shells. A portion suitable for toddlers is about half of the adult's portion, ca. 15 g per day.

The main reason for the restriction of the quantity is the particularly high fat content and thus the high energy content of nuts and almonds. Flax and some other oil plants have a natural tendency to accumulate heavy metals, especially cadmium, from the soil into their seeds. This is why the recommended amount of flax seeds or seeds of other oil plants is

at most 2 Tbsp. (ca. 15 g) for adults per day. Children's portion can be about half of that of adults (1 Tbsp., 6–8 g) and the products should be varied.

Salads should be eaten with an oil-based dressing or just vegetable oil. If cooking fat is needed, choose vegetable oil, a fluid vegetable oil product (squeeze-bottle margarine) or a vegetable fat spread with a fat content of 60–70%. Rapeseed oil is a particularly good source of alpha-linolenic acid in the Finnish diet.



◆ A diet containing unsaturated fat from vegetable products and fish reduces the risk of type 2 diabetes, cardiovascular disease, high blood pressure and certain cancer types.

TABLE 2. Good sources of soft fat

Food	Portion	Linoleic acid (omega-6) g/portion	Alpha-linolenic acid (omega-3) g/portion
Rapeseed oil	1 Tbsp. (14 g)	3	1.5
Olive oil	1Tbsp. (ca. 14 g)	1.5	0.08
Vegetable margarine, 60% fat	1 tsp. (ca. 5 g)	0.9	0.3
Cashew nut	0.5 dl (ca. 30 g)	2.7	0.02
Walnut	0.5 dl (ca. 30 g)	13.3	3.2
Sunflower seed	1Tbsp. (ca. 10 g)	3.1	0.01
Daily minimum intake with an average expenditure of 2000 kcal		7 g (3% of total energy)	1 g (0.5% of total energy)
Intake with 2000 kcal expenditure during pregnancy		11 g (5% of total energy)	2 g (1% of total energy)



Essential fatty acids, linoleic acid and alpha-linolenic acid, must be obtained from food, as the body is not able to make them.

### Beverages

The required daily intake of fluids is about 1–1.5 litres. Most people can satisfy their need for fluids by drinking to thirst. Recommended beverages at meals include fat-free milk or buttermilk, salt-free mineral water or plain water. The best thirst quencher is water. Fruit juice and/or juice from concentrate can be consumed daily at a meal, but no more than one glass.

Coffee, tea, cocoa, cola and energy drinks contain caffeine. High intake of caffeine may cause e.g.

heart palpitations, arrhythmia, agitation, restlessness, irritability, stomach problems and reduced stress tolerance as well as sleep disorders, particularly if caffeine is consumed just before bedtime. Energy drinks that contain caffeine have the same adverse effects as other products containing caffeine. One cup of brewed coffee contains ca. 60–135 mg of caffeine, a 3.3 dl can of cola drink about 40 mg and a 2.5 dl can of energy drink about 80 mg. For adults, the daily intake of caffeine that is considered safe (400 mg) equals about 4 cups of coffee, but for pregnant and lactating women the intake limit is 200 mg (about two cups of coffee). The caffeine content of tea varies between tea types, with black tea containing about half of the caffeine level of coffee.

There are large differences in individual tolerance to caffeine. For children, 3 mg / kg of body weight / day is considered a safe intake. In addition to cola

drinks, also cocoa and chocolate sweets can act as sources of caffeine for children. Beverages with a high content of caffeine are not recommended for children under 15 years of age (Annex Table 1 on p. 109).

The consumption of alcoholic beverages should be restricted so that the daily intake does not exceed 12 grams of alcohol (converted into ethanol) for women and 24 grams for men. In practice, this translates into one and two portions of alcoholic beverages per day for women and men, respectively. Binge drinking may cause problems, even if the average daily consumption remains under the recommended amount. In families with children, parents should consider their alcohol consumption from the children's viewpoint. Pregnant and lactating women as well as children and adolescents must not consume alcohol-containing beverages at all.



## TIPS TO FAMILIES

### BEVERAGE CHOICES:

- Water is the best primary beverage.
- Consume fluids at the same intervals as food.
- Beverages that contain sugar are the most important source of hidden sugar.
- Choose fruit and berries as such over juices; they have a higher nutritional content than juices.
- Limit your consumption of sugar-containing drinks to mealtimes to avoid unnecessary damage to your teeth.

### Consume sugar sparingly

Sugar may cover at most 10% of the daily total energy intake. The natural sugar of milk, fruit, berries and vegetables need not be avoided. The recommendation means that if the daily energy intake is 2000 kcal (8.4 MJ), for example, the intake of added sugar may not exceed 50 g (3.5 Tbsp.). The average energy consumption of a two-year old is 1200 kcal, and thus their daily intake of added sugar should not exceed 30 g (2 Tbsp.); correspondingly, the 1500 kcal average energy expenditure of a five-year old means that their maximum daily intake of sugar is 38 g (2.5 Tbsp.). This is not much, and is easily accumulated from regular food.

Less than 5% of the daily sugar intake comes from sugar added in food at the table. According to studies, children obtain the majority of their sugar intake from the sugar added in juices, yogurts, other sweetened milk products, baked products, biscuits and sweets. Daily consumption of these products increases the children's intake of sugar and reduces the nutrient density of their food.

◆ *Frequent and excessive consumption of sugar causes dental caries. It also results in weight management difficulties and may lead to overweight. Overweight, on the other hand, increases the risk of several diseases, such as type 2 diabetes.*

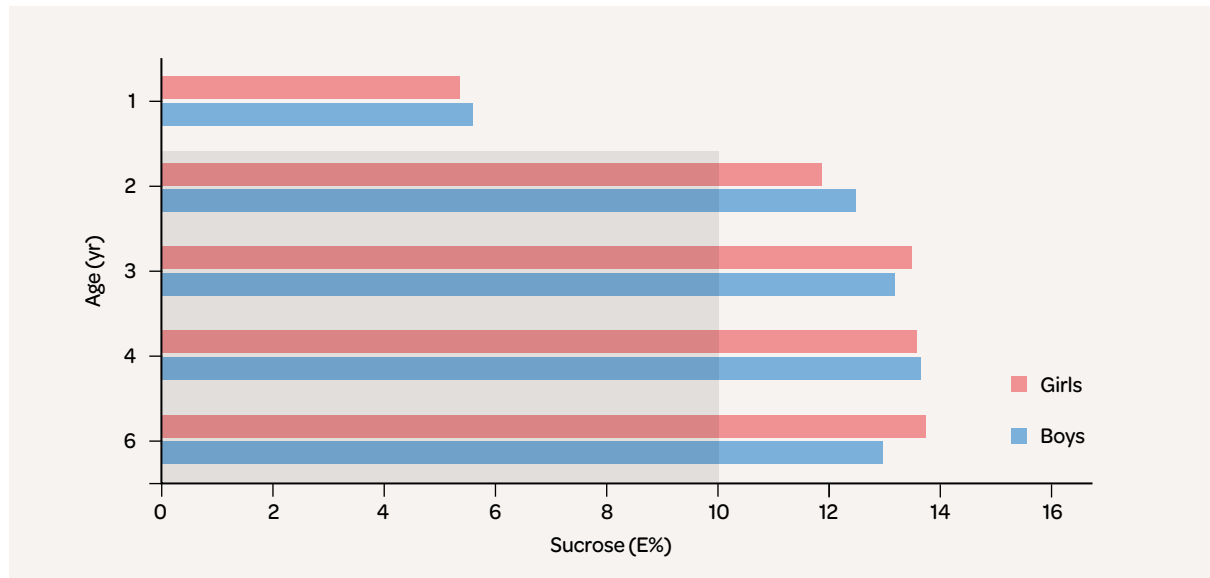


FIGURE 4. Sugar intake of children aged 1–6 years in energy percent (E%) compared with the recommendation (10E%). Recommendation: No more than 10% of the daily energy intake should come from sugar.



Fruit juices, including juice made from concentrate, contain as much sugar as sodas!

Infants under one year do not need added sugar. Sweetness is addictive and the child will find it harder to accept sour and bitter tastes.



Parents set an example in eating sweets to their children. The limits of moderation are learned together.



**Sugar addiction does not develop into physical dependency. Sugar eating habits and cravings are learned behaviour.**



## TIPS TO FAMILIES

### CUTTING BACK ON SUGAR:

- Milk products may contain a surprisingly large amount of added sugar. Choose plain yogurt, quark and other fermented milk products ("viiili") and flavour them yourself with berries and fruit.
- The sugar content of muesli and breakfast cereals can be more than 30% (e.g. chocolate cereals, muesli cereals, honey cereals) and they are often also high in salt and fat. Choose products with a sugar content of at most 16 g / 100 g.
- Favour porridge and unsweetened or homemade muesli for breakfast.
- Fruit and berries are acceptable treats every day.
- Cookies and biscuits should not be part of the daily diet. They can be replaced with e.g. pieces of root vegetables and fruit, vegetables, berries, banana chips, plain nuts and almonds.
- Consider package sizes: a smaller package is enough to satisfy the craving for treats.
- Buy smaller bags of sweets instead of the jumbo bags. Choose the suitable package size already in the store. You usually finish the whole bag in any case. A 200-gram bag of sweets, for example, is enough to share between several persons.
- Curb your sweet tooth by drawing up a plan that best suits you. For some the best plan is to eat sweets on one day a week, for others a small daily treat is a better alternative.

### Restricted salt intake

The recommended salt intake of adults is max. one teaspoon (5 g) per day, including the salt added in the food at home and the salt contained in convenience and processed foods. Since sodium is naturally contained in almost all foods, healthy children and adults have an adequate sodium intake without having to add salt in the food. Added salt or foods containing salt are not used at all in the nutrition of infants, because excessive sodium intake causes stress to the kidneys. Using no salt supports the development of a taste for low-salt products, because it is easy to get used to the taste of salt. For children under 2 years of age, salt intake must not exceed 2 g/day (ca. 0.5 tsp.), and for 2–10 year olds the maximum intake is 3–4 g/day.

For Finnish people, the main source of salt is bread. For example, six slices of high-salt bread (salt content 1.6%) contain 2.4 grams of salt, while the same amount of low-salt bread (0.7%) only contains 1 gram.

◆ *Restricted salt intake protects against hypertension, cardiovascular disease, stomach cancer and stroke. Excessive salt intake may also increase the risk of osteoporosis and trigger asthma symptoms. A health-promoting diet low in salt is as effective on blood pressure as medicinal treatment.*

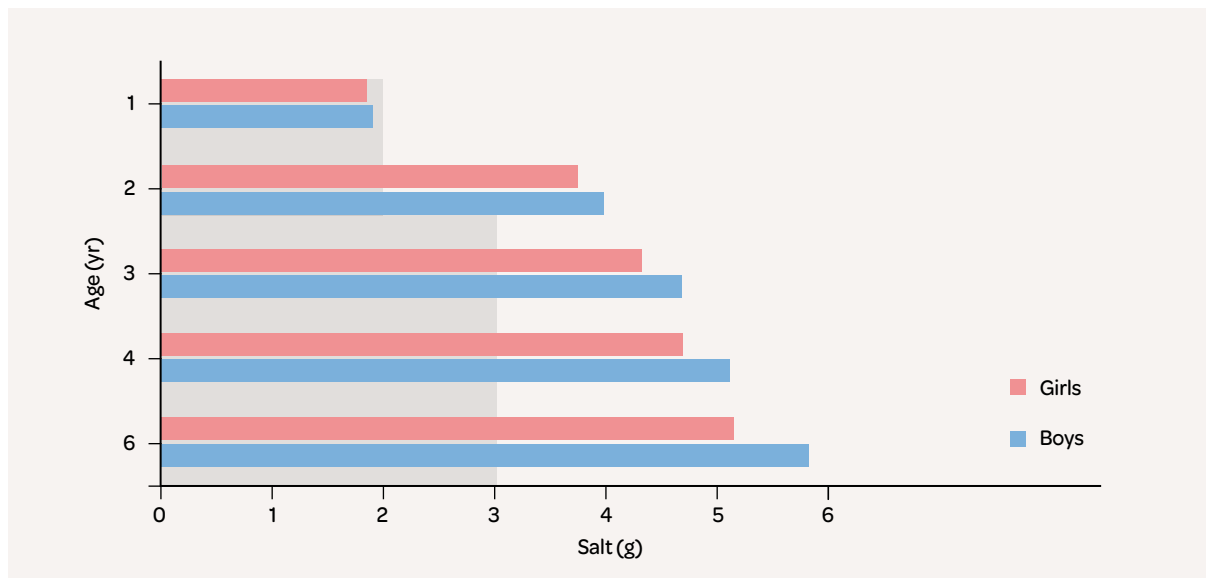




FIGURE 5. Salt intake of children aged 1–6 years compared with the recommendation. Recommendation: max. 2 g/day for under two-year old infants, max. 3–4 g/day for 2–10-year old children, and max. 5 g/day for adults.





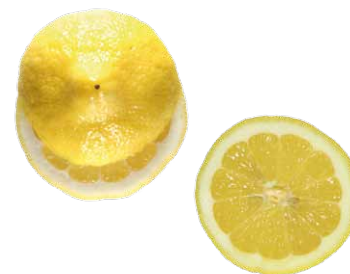
Study the labelling and choose products with a low salt content.



Make sure to use iodised salt.



Children's salt intake quickly accumulates from breakfast cereals, deli meats and bread.



## TIPS TO FAMILIES

### CUTTING BACK ON SALT:

- Use as little salt as possible when preparing food for your family. Measure salt with a spice spoon or a teaspoon, for example, to ensure you use a proper amount of salt.
- Salt can be replaced in cooking with herbs, citrus juice (e.g. lemon juice) and vinegar.
- Choose low-salt food products in the store.
- Do not add salt in the cooking water of e.g. potatoes, vegetables, rice and pasta.
- Pay particular attention to the salt content of bread, cheese and deli meats.
- Exchange potato crisps for low-salt popcorn.

## Iodine

Studies indicate that the iodine intake of Finnish people is too low. The recommended intake of iodine is 150 micrograms per day for adults (Table 3a). Iodine is a mineral that is necessary to humans. In Finland, the iodine content of the soil is very low. Significant iodine deficiency can cause thyroid enlargement, and disturb growth and development in children. The best sources of iodine include dairy products, fish, egg and iodised salt. In order to increase the iodine intake of Finnish people, iodised table salt shall be used in food industry, catering services and at home, both in cooking and in baking. The use of some preparations containing iodine (e.g. drops, preparations and seaweed) may result in excessive iodine intake. The dosage instructions of such products must be followed. Excessive iodine intake may induce thyroid dysfunction, i.e. goitre, hyperthyroidism or hypothyroidism. The safe intake limit specified for iodine, including iodine from the diet and from any food supplements, must not be exceeded (Table 3b).

TABLE 3a. Iodine intake recommendations (Finnish National Nutrition Council, Finnish nutrition recommendations, 2014)

Age/Target group	Iodine µg/day
6–11 mo	50
12–23 mo	70
2–5 yr	90
6–9 yr	120
10–74 yr	150
Pregnant women	175
Lactating women	200

TABLE 3b. Safe upper limit for iodine intake by age group

Age/Target group, years	Maximum safe intake (EFSA), µg/day
1–3	200
4–6	250
7–10	300
11–14	450
15–17	500
Adults	600
Pregnant and lactating women	600



Iodised table salt  
is the best salt choice  
in nutritional terms.

FIGURE 6. Iodine from food and a pinch of iodised salt.



## TIPS TO FAMILIES

### SECURING ADEQUATE IODINE INTAKE:

- Include foods containing iodine in your diet on a daily basis (Figure 6 and Table 4).
- Use iodised salt. The labelling of the salt product will tell you, if it is iodised.
- Choose products in which iodised salt is used. If iodised salt is used in the product (e.g. bread), it is indicated in the list of ingredients in the product labelling.
- Always choose low-salt products.
- When eating outside the home, ask the caterers if they use iodised salt in cooking – this will also encourage them to start using an iodised product.
- If you are a vegan or cannot use milk (e.g. a no-milk diet), use a food supplement that contains iodine. Follow the instructions provided for the use of the product and do not exceed the recommended daily intake of iodine (Table 3a).
- Note! Soy and grain based drinks do not contain iodine.
- Always check the iodine content of seaweed products or products containing seaweed. Follow instructions for use and dosage.
- Avoid seaweed products with unknown iodine content. Excessive iodine intake has adverse effects.

TABLE 4. Natural sources of iodine, and iodine intake in a diet based on nutrition recommendations

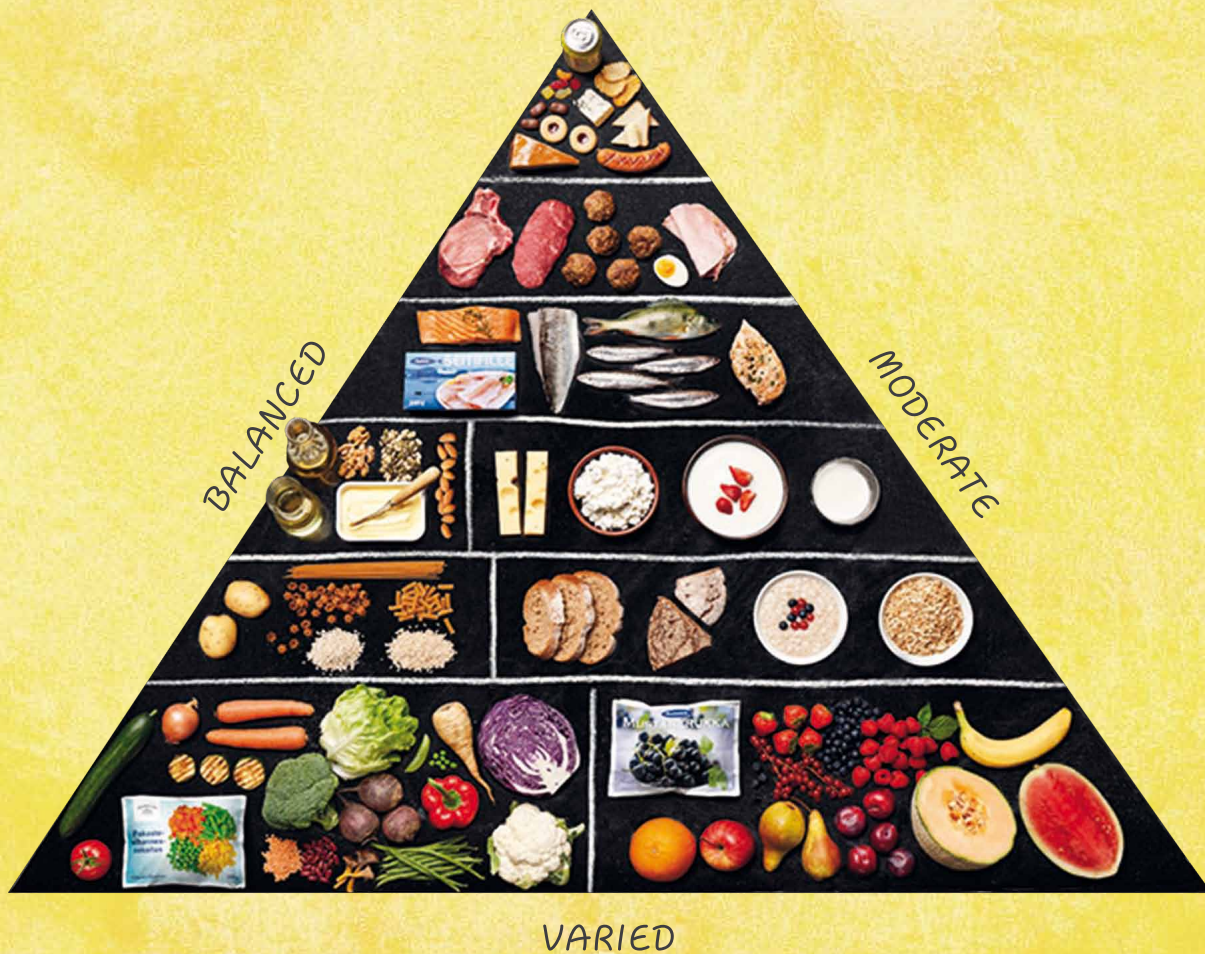
Food	Iodine $\mu\text{g}/100\text{g}^1$	Ruoka-aineen käyttösuositus	Iodine intake from recommended consumption $\mu\text{g}/\text{day}$	Remarks
Milk/buttermilk	15	5–6 dl/day	75–90	Or equal amount of other milk products, such as quark, yogurt and other fermented products ("villi"), and ice cream
Cheese	20	20–30 g/day (= 2–3 thin slices)	4–6	Chunk cheese. Iodine content varies between products
Fish	30	2–3 fish foods / week	10–15	One serving of fish 100 g/meal, using different species. Iodine content varies between species.
Egg	40	2–3 eggs/week	9–14	Whole egg
<b>Total amount of iodine from indicated portions per day:</b>			<b>100–125<sup>2</sup></b>	

<sup>1</sup> Source: Fineli 2015. The iodine contents are average values for the food group. The iodine amount indicated in the Table is the amount of natural iodine in the food (no added salt).

<sup>2</sup> Means that the intake of natural iodine is on average 100–125  $\mu\text{g}$  per day, when the recommended foods indicated in the Table are included in the diet (daily/weekly). It is further recommended that iodised salt with 25  $\mu\text{g}/\text{g}$  of added iodine be used. Using e.g.  $\frac{1}{2}$  tsp. (= 2.5 g) of iodised salt per day increases iodine intake to 160–188  $\mu\text{g}$  per day (target for adults is 150  $\mu\text{g}$ ).

## 2.4 Food safety

A balanced, varied and moderate diet is the best way to avoid the effects of any harmful substances contained in foods.



As a rule, Finnish food is clean and safe. However, foods may involve risks that can cause health problems; these include microbes (e.g. listeria), micro-organisms, plant protection products and environmental contaminants, like heavy metals. Some foods contain nitrate naturally, or the cooking process may produce harmful substances, such as PAH compounds (polycyclic aromatic hydrocarbons). The consumption of some foods should be restricted for this reason. Boiling, stewing and cooking in an oven or microwave oven reduce the production of harmful substances in the cooking process. Dark browning and smoke cooking should be avoided, because these methods produce higher amounts of harmful acrylamide and PAH compounds than other methods.

The microbiological safety of food is primarily based on good hygiene in the handling of foods, a cold chain and correct preparation and storage temperatures. Good kitchen and hand hygiene as well as proper handling of foods are important factors. Microbes contained in food cannot be detected without special equipment or a laboratory analysis. However, preliminary observations about the hygienic quality of food can be made by checking it with your eyes and nose for e.g. mould. Sensory detection of food poisoning bacteria is not possible, however.

The instructions provided in labelling for the storage and use of the food must be followed. Pursuant to food laws, labelling shall contain warnings to children and pregnant women about, for example, added caffeine which can be harmful to vulnerable consumer groups.

Recommendations for the consumption of foods are issued on the basis of both data obtained from scientific research (e.g. instructions given for the consumption of certain fish, liver and sausages) and the so-called precautionary principle (e.g. that

children should not drink herbal teas and pregnant women should not use ginger products). The precautionary principle means that the product in question is justifiably suspected of having adverse effects, but the risk cannot be determined with sufficient certainty with the methods available at present. The instructions for use of a food product shall take account of both the health benefits and the potential adverse effects related to the consumption of the food. The evaluation process is carried out based on the use and target user group of the food as well as the occurrence of the potential risk and the adverse effects it could possibly have. Recommendations for consumption may be changed as more research data become available.

In the food sector, the producers, manufacturers and sellers of food have the primary responsibility for the safety of the food. In Finland, compliance with the requirements of food laws is controlled in municipalities based on risk assessments using random tests and targeted control projects. Imported food is controlled by the Customs and Finnish Food Safety Authority Evira. The safety of food is under close surveillance also on international level.

### *Small children, pregnant and lactating women – vulnerable consumer groups*

From the point of view of food safety, small children as well as pregnant and lactating women represent so-called vulnerable consumer groups. Any harmful substances in the diet of the mother may during pregnancy and breastfeeding be carried to the developing foetus or to the nursing infant. The vulnerability of small children, on the other hand, is increased by their much more restricted diet than the diet followed by adults, which means that small children can consume a large amount of an individual ingredient in proportion to their body weight, which increases the relative risk of exposure. In general, children are more vulnerable to the potential adverse effects of chemical compounds than adults, because their body is not yet ready to process contaminants. Children are also more vulnerable to microbes, as the immune system develops with age. The vigorous growth of children and their higher energy expenditure per one kilogram of body weight increase their need for nourishment compared with adults, and this makes it even more important that safety factors are considered particularly with children.

Food control authorities provide information based on research and expert data on harmful substances found in foods as well as instructions for the safe consumption of foods. Instructions regarding the most common recommendations and restrictions for the whole family are presented in Annex Table 1 on page 109.

### *Food additives*

Food additives and other food treatment agents (aromas and enzymes) are substances that are added intentionally in foods. Additives are used to improve the durability of the food, for example; enzymes are used to affect the texture of the product, while aromas affect the taste of the food. The safety of and the need for additives are assessed before they are authorised for use. The use of additives is provided for in legislation. The labelling of the product must indicate the additives used in the production of the food, as well as the use of aromas, if any. Additives must be shown in the labelling by the group name indicating their purpose of use, as well as by the name or the E number or E code of the additive concerned. In a balanced diet, the use of food treatment agents does not pose any danger or harm to health. In order to avoid excessive intake of nitrite and benzoates used as preservation agents, consumption recommendations have been issued for children (Annex Table 1).



## FOOD ADDITIVES

- Additives are substances added in foods for a certain purpose, e.g. to guarantee the durability of the food.
- Most additives are substances found naturally in the foods. The intake of additives can be limited by choosing basic foods. These include fresh meat and fish, eggs, milk, fresh vegetables, berries and fruit. Only very restricted use of additives is authorised in the production of these foods.
- Organic products contain either no additives at all or considerably smaller amounts of additives than regular foods.
- The labelling indicates if and which additives are used in the production of the food. A mobile E number key can be found at [www.evira.fi](http://www.evira.fi)

TABLE 5. Reduce your intake of additives by choosing basic foods

No additives	Low in additives	High in additives
Meat, fish	Deli meats	Sausages, hot dog sausages
Milk, plain yogurt	Chocolate drinks	Flavoured yogurt, pudding
Whole grain hot cereals	Bread	Stuffed cookies
Berries, fruit	Fruit and berry based drinks	Soft drinks, popsicles
Nuts	Chocolate	Sweets, crisps



*Food supplements only in special circumstances, with the exception of vitamin D*

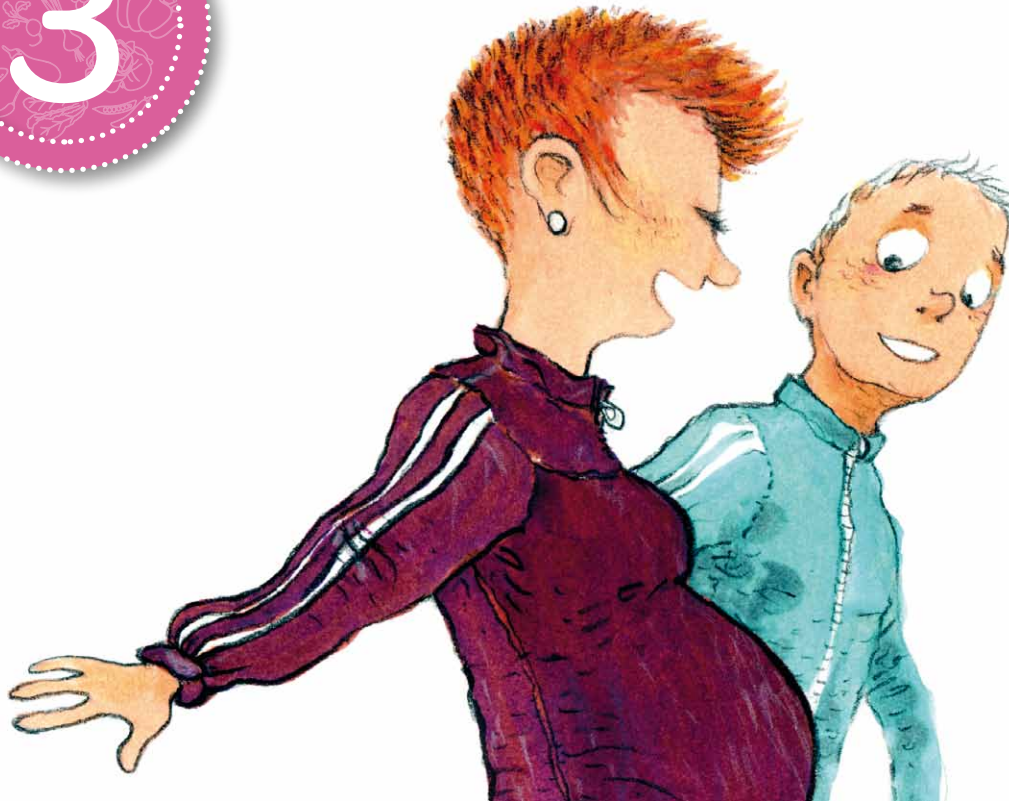
Food supplements are foods that differ from regular foods in their appearance or purpose of use; they can be e.g. pills, capsules or herbal extracts. Food supplements include products used as sources of e.g. vitamins, minerals, fibre and fatty acids, as well as various herbal products. Food supplements may contain substances, such as various plants, that can cause interactions with medicines. It is important to bring up the use of food supplements in health care and to assess if they are necessary.

The recommended intake of nutrients always includes a safety allowance. Exceeding the recommended intake will not bring any additional benefits; on the contrary, it may even have adverse effects.



**i** FOOD SUPPLEMENTS

- Food supplements are to be used when a health care professional has concluded a deficiency of a nutrient in the diet.
- Food supplements are only needed to support an unbalanced diet and when following a special diet, if all the required nutrients cannot be obtained from food.
- The use of food supplements does not replace a balanced diet.
- There are specific instructions for food supplements designed to be used during pregnancy and breastfeeding (Table 7 on p. 54).
- Unnecessary food supplements may hinder the absorption of other nutrients and excessive intake may involve adverse effects. Excessive calcium supplement intake, for example, has been found to increase the risk of coronary heart disease.
- An overdose of vitamins and minerals through the use of food supplements may have adverse effects, and because of this, the dosage instructions of food supplements must not be exceeded and products with overlapping ingredients must not be used.



# NUTRITION BEFORE AND DURING PREGNANCY

## MAIN POINTS

- ▶ The need for several nutrients increases during pregnancy and lactation (Annex Tables 4–7) and it is therefore important to pay attention to the quality of the diet.
- ▶ As the increase in energy consumption is fairly small, the greater need for vitamins and minerals shall be primarily satisfied by increasing the nutrient density of the diet, in other words, by adding in the diet foods low in energy but high in protective nutrients.
- ▶ Foods that can be particularly recommended during pregnancy include all berries, fruit and vegetables, whole grain cereals and fat-free milk products, meat products with the lowest fat content as well as fish.
- ▶ During the first trimester, the nutrition and the growth of the foetus are primarily determined by the nutritional status of the mother prior to pregnancy. This is why attention should be paid to the quality of the diet already when pregnancy is planned.
- ▶ The use of vitamin D supplementation is recommended for all pregnant women throughout the pregnancy, and the use of a folic acid supplement just before and during early pregnancy. The need for other food supplements is assessed on an individual basis.

Conception starts a time window of one thousand days during which the foundation is laid for the development and lifelong health of the individual.



### 3.1 Family lifestyle before pregnancy

The development of a child is regulated by the genotype and the environment. Lifestyle refers to environmental factors that can be influenced throughout life. Starting a family and planning a pregnancy are ideal phases to try to influence the family lifestyle in a positive way. It pays to influence the lifestyle of a couple expecting their first child, because the birth of a child will in any case change their life in many ways. The lifestyle of the whole family should be considered from the viewpoint of the new baby, because children imitate the other family members and the model provided by the parents is important.

The nutrient stores of the body have a significant effect on the development of germ cells and on conception, in both men and women. In fertile age, nutrition is used to build one's own bodily systems and it also influences the health of the next generation. The folate and fatty acid stores of the female body, in particular, affect the development of the embryo already during the first weeks of pregnancy. A diet that complies with nutrition recommendations ensures an ideal nutritional status already before pregnancy. As folate intake on average is fairly low in Finnish women, a folic acid supplement is recommended already prior to pregnancy (Table 6 on p. 50). The foetus gets the nutrients it needs from the mother's body and it is the mother's task to make sure that her nutrient stores are adequate.

It is advisable for women to try to obtain normal weight before pregnancy, because obesity increases the risk of developing complications during pregnancy. Overweight is also a key risk factor for national diseases. The susceptibility to type 2 diabetes can be demonstrated during pregnancy as reduced glucose tolerance or gestational diabetes. For about half of overweight women, their weight gain started with pregnancies. In most cases excessive weight gain during pregnancy is caused by an unhealthy diet and lack of exercise.

#### *Pregnancy does not prevent exercise*

The general exercise recommendations can well be followed during normal pregnancy. If there are no clear medical reasons to prevent exercise, the recommendation is to engage in at least 150 minutes of moderate intensity exercise per week, divided over several days. If a woman has not exercised prior to pregnancy, it is important to start with caution, for example 10–15 minutes three times a week, and then gradually increase the duration and frequency of weekly exercise.

[http://www.ukkinstituutti.fi/ammattilaisille/terveysliikunnan-suositukset/liikunta\\_raskauden\\_aikana](http://www.ukkinstituutti.fi/ammattilaisille/terveysliikunnan-suositukset/liikunta_raskauden_aikana)

## 3.2 Adequate level of nutrients for mother's well-being and foetal growth and development

It should particularly be ensured during pregnancy that the mother's diet is sufficiently balanced and of good quality. The need for several vitamins and minerals increases considerably, although only a little more energy is needed. The nutrients that are required for the well-being of the mother and for the growth and development of the foetus can be obtained from a health-promoting diet (Chapter 2). As the intake of vitamin D and folate is fairly low in Finland, a vitamin D product is recommended to all pregnant women through the pregnancy. Folic acid products are recommended prior to and during early pregnancy. A public health nurse or a doctor will assess every pregnant woman individually for their need for iron, calcium and iodine supplements.

In order to ensure an adequately high intake of vitamin D during pregnancy and breastfeeding, a vitamin D product is recommended at a dosage of 10 µg (400 IU)/day all year round (Table 7). The absolute daily upper intake limit for a vitamin D supplement is 100 µg due to potential adverse effects.

During pregnancy, special attention shall be paid to an adequate intake of iodine. Iodine deficiency during pregnancy may at worst result in foetal growth disturbances and disturbances of mental development. In less severe cases iodine deficiency may have harmful effects on the cognitive development of the child resulting later in reduced performance at school or at work. On the other hand, excessive intake of iodine may cause goiter and hypothyroidism in the newborn

baby. Harmful amounts of iodine can be obtained from dried seaweed, food supplements and some medicines. The best sources of iodine include dairy products, bread, fish and iodised table salt. Annex Table 1 on p. 109 provides general instructions related to the safe use of foods, and lists the foods the use of which is at present known to involve potential risks.

### *Vegetables, berries and whole grains are sources of fibre, iron and folate*

Vegetables, fruit and berries constitute the basis for the diet during pregnancy. In addition to whole grain products, they are the most important source of folate in the diet of Finnish women (folate and folic acid recommendations, cf. Chapter 3.3). Whole grain products, particularly rye bread, are good sources of iron, and good vegetable sources of iron include soy, beans, lentils, peas and dark green vegetables. The absorption of non-heme iron obtained from plants is enhanced by simultaneous consumption of vitamin C; this can be realised by consuming berries and fruit in connection with an iron-containing meal. Pregnant women whose diet is low in energy or who follow a poorly balanced vegetarian diet form the largest risk group for iron deficiency.



## TIPS TO FAMILIES

### MORE FIBRE FROM FOOD:

- Recommended fibre content at least: white bread 6%, brown bread 10%, crispbread 15%.
- Use also legumes which have the highest fibre content of any vegetables.
- Try e.g. lentil soups, stews containing legumes and pastes to spread on bread.
- Add bran or crushed seeds in porridge as well as in quark, yogurts and other fermented milk products (“villi”). Bran and crushed seeds go well also in smoothies and salads.

### *Iron from meat and fish*

The blood haemoglobin decreases for most pregnant women as a result of the increased volume of blood (haemodilution) and increased need for iron. Good iron balance during pregnancy requires iron stores of an estimated 500 mg. About half of the iron need during pregnancy can be satisfied from diet, while the other half has to be taken from the mother's iron stores or obtained from an iron supplement. If the haemoglobin level is low (less than 110 g/l) during early pregnancy, the start of iron medication is to be assessed after pregnancy week 12 (Table 7 p. 54). The heme iron contained in meat and fish is absorbed more efficiently than the non-heme iron obtained from plants. The absorption of iron, particularly non-heme iron, is adversely affected by e.g. phytates (in grains and legumes), tea, coffee, cocoa and dairy products.

### *Dairy products are a source of calcium, vitamin D and iodine*

Fat-free fluid dairy products are recommended during pregnancy at 5–6 dl/day as well as 2–3 slices of cheese to ensure adequate intake of calcium and to supplement the intake of vitamin D and iodine. Low-fat and low-sugar dairy products should be preferred. Adequate vitamin D content in serum is a precondition for the body to be able to satisfy the calcium need of the foetus.



### *Fish are a source of good-quality fatty acids, vitamin D and iodine*

Fish are especially important in the diet of pregnant women due to the n-3 polyunsaturated fatty acids and vitamin D contained in fish. Fish are also a good source of iodine. Several studies have shown that eating fish during pregnancy has a beneficial effect on the visual and cognitive development of the child. Fish should be eaten 2–3 times a week during pregnancy, varying the fish species. The varying of species will ensure that possible environmental contaminant levels need not be specifically taken into account. Fish that are recommended during pregnancy include e.g. vendace, Pollock, whitefish and farmed fish, such as rainbow trout.

### *Visible fats based on vegetable oils to be favoured*

Abundant intake of essential fatty acids and their long-chain derivatives is necessary for the normal development of the foetus. Polyunsaturated essential fatty acids (linoleic acid and alpha linolenic acid) are essential for the development

There is not enough scientific data on the benefits of fish oil capsules as a source of n-3 fatty acids during pregnancy.

of, for example, the nervous system, vision and the immune system. Vegetable oils, margarines and fish are the primary sources of long-chain n-3 fatty acids. Fish are the most important source of long-chain docosahexaenoic acid and eicosapentaenoic acid.

At least two thirds of the fat consumed by the mother should be soft vegetable fat: vegetable oils and table margarines containing vegetable oils. If the mother cannot eat fish due to e.g. a food allergy, it is important that she uses rapeseed oil. The need for these fats is particularly high during the last trimester and during the baby's first months when the brain develops. One third, at most, can be hard fat. Hard fat is obtained in abundance from fatty meat and dairy products, butter, coconut oil and coconut fat.

◆ *The quality of fat and adequate intake of long-chain fatty acids, in particular, have been shown to have a favourable effect on the duration of pregnancy, lower risk of premature birth and the child's visual and cognitive development.*

### 3.3 Folate intake from food and recommendation for use of folic acid supplement when planning for and during pregnancy

#### MAIN POINTS

- ▶ Folate intake is adequate from food if the diet contains plenty of vegetables and whole grains. The recommended intake of folate when planning for pregnancy and during pregnancy is 500 µg per day.
- ▶ Due to the Finnish people's inadequate intake of folate, a folate supplement is recommended for everybody planning for pregnancy, so as to prevent neural tube defects in the foetus (cf. Table 6).
- ▶ The use of a folic acid supplement should be started about two months before planned pregnancy (before stopping birth control) and continued until the end of pregnancy week 12.



#### *Folate and folic acid*

Folate is a water-soluble vitamin of the B group (vitamin B<sub>9</sub>), which is needed for cell division and production of blood cells. The need for folate increases during pregnancy. The vitamin form found in food is referred to as folate. Folic acid is the corresponding synthetic vitamin used in vitamin products and other food supplements as well as in fortified foods.

#### *Folate recommendation and Finnish women's folate intake*

The recommended intake of folate from food when planning for and during pregnancy is 500 µg per day. The recommendation is fulfilled, if the diet contains plenty of vegetables and whole grain cereals (Figure 7). Nutrition study Finravinto 2012 showed that the average intake of folate from food for women aged 25–34 years was 237 µg/day. In order to fulfil the recommended intake of folate from food, the consumption of vegetables shall be considerably increased from the present level.



## Significance of folate to foetal development

Adequate folate stores of the woman when planning for pregnancy before conception and during the early pregnancy weeks are extremely significant to the development of the central nervous system of the foetus. The neural tube closes already during the first pregnancy weeks and deficient availability of folate at this point will increase the risk of neural tube defects (NTD). There is sound research evidence that a daily folic acid supplement, either on its own or in a vitamin-mineral product decreases the NTD risk of the foetus considerably<sup>1</sup>. Research

<sup>1</sup> Neural tube closure defects are severe congenital malformations; spina bifida can cause a severe degree of disability while anencephaly results in the death of the foetus or the newborn. The total concurrence of these disorders was 7.6/10 000 children born in Finland in the years 1993–2011 i.e. on average 45 NTD pregnancies were reported every year, 18 of which were carried to term. (Source National Institute for Health and Welfare, Register of Congenital malformations)

data on the protective influence of a folic acid supplement against other defects or miscarriages are not adequate.

## Adequate intake of folate from the diet

Even when a folic acid supplement is used during the early pregnancy, it is still recommended that the intake of folate be secured throughout the pregnancy through a balanced diet containing plenty of vegetables and whole grain products.



FIGURE 7. Meals composed according to the food recommendations are rich in folate. Folate intake is the highest from whole grain cereals, dark green vegetables, legumes, fruit and berries, as well as dairy products. The meals shown in the Figure give a total intake of 600  $\mu\text{g}$  of folate.

### Recommendation for folic acid supplementation

As the average intake of folate is low for Finnish women in fertile age, everybody planning for pregnancy is recommended to use a folic acid supplement (400 µg/day) to support their diet in order to reduce the NTD risk of the foetus (Table 6). For this reason, a folic acid supplementation as well as protective medication in high risk cases are started already about two months before the planned pregnancy or termination of birth control, and continued until the end of pregnancy week 12. For women with a higher than normal risk of foetal NTD (2–3 %) planning for pregnancy, the use of a medicinal folic acid supplement (4 mg/day) is recommended (requires a prescription).

The folic acid supplement can be in the form of a folic acid product or a multivitamin product that contains folic acid. The products shall be used in

compliance with the daily intake recommendations or as advised by the doctor. The long-term effects of large doses of folic acid are not known. In individual population surveys, large doses (more than 1 mg) of a folic acid supplement used over a very long period have been linked with a higher risk of colon cancer and breast cancer, but there is not enough research data available. Long-term folic acid supplementation in doses of more than 1 mg may mask megaloblastic anaemia which is indicative of vitamin B<sub>12</sub> deficiency (uncommon in fertile age).

The health insurance does not cover preventive folic acid supplementation or medication. The NTD protection provided by folic acid products is not complete and therefore it is advisable to refer pregnant women with a high foetal NTD risk to the foetomaternal medical centres of the university hospitals already at the beginning of pregnancy.

TABLE 6. Recommended use of folic acid supplement when planning for and during pregnancy

Target group	Folic acid supplement	Recommended period of use
All women planning for pregnancy	400 µg/day	Started when planning for pregnancy about two months before termination of birth control and continued until end of pregnancy week 12.
Women planning for pregnancy with <ul style="list-style-type: none"> <li>• medication for epilepsy</li> <li>• other medication that reduces the level of or increases the need for folate (e.g. methotrexate, long-term sulfa medication, trimethoprim, lithium)</li> <li>• type 1 or 2 diabetes</li> <li>• body mass index <math>\geq 30</math> kg/m<sup>2</sup></li> <li>• intestinal malabsorption</li> <li>• high alcohol consumption, or</li> <li>• NTD in the mother's or the father's family.</li> </ul>	400 µg/day or a larger dose according to the doctor's individual advice	Started when planning for pregnancy about two months before termination of birth control and continued until end of pregnancy week 12.
Women planning for pregnancy, when <ul style="list-style-type: none"> <li>• parents have had a common NTD child or foetus</li> <li>• one parent has had an NTD child or foetus with a previous partner, or</li> <li>• one parent has had NTD her/himself.</li> </ul>	4 mg/day Prescription medicine	Started when planning for pregnancy about two months before termination of birth control and continued until end of pregnancy week 12.

## 3.4 Special conditions during pregnancy

### *Weight control as an objective*

Unhealthy diet is the most important reason for excessive weight gain during pregnancy. The overweight of the expectant mother has adverse effects on pregnancy outcome and later increases the risk of overweight for both the mother and the child. On the other hand, 2–10 percent of young women suffer from some degree of eating disorder and restricted eating, which may affect pregnancy. It is important that underweight and very young women gain enough weight during pregnancy, because inadequate weight gain may retard foetal development. Weight gain is during mid- and late pregnancy considered inadequate, if it is less than 1 kg a month. The changes caused by pregnancy can activate problems related to eating and weight control. It is advisable to postpone pregnancy until the eating disorder is under control.

General recommendations for weight gain during pregnancy vary according to the mother's body mass index (BMI) prior to pregnancy as follows:

- underweight: body mass index < 18.5: weight gain 12.5–18.0 kg
- normal weight: body mass index 18.5–24.9: weight gain 11.5–16.0 kg
- overweight: body mass index 25.0–29.9: weight gain 7.0–11.5 kg
- obese: body mass index ≥ 30.0: 5.0–9.0 kg

### *Vegetarian diet and pregnancy*

Lacto, lacto-ovo and semi-vegetarian diets are suitable also for pregnant and lactating mothers. Most vegetarians are lacto vegetarians who use dairy products. Lacto-ovo vegetarians eat dairy products as well as eggs, and semi-vegetarians eat white meat or fish every now and then. A vegan diet is also safe during pregnancy, provided it is well-balanced. Vegans do not eat any foods of animal origin and the nutritional value of their diet differs significantly from other vegetarian diets. Special knowledge and availability of foods suited for vegans are needed to compose a balanced vegan diet. During pregnancy, fortified foods and/or food supplements should be used to ensure adequate intake of vitamins B<sub>12</sub> and D, riboflavin, calcium, iron, zinc, iodine, selenium and protein. Mothers on a vegan diet require the guidance of a nutritional therapist during pregnancy (cf. Chapter 8.1 p. 99).

### *No elimination diets*

According to present understanding, the elimination of allergy-inducing foods during pregnancy and breastfeeding does not reduce the risk of allergic diseases for the child even in families with an elevated risk of allergies. On the contrary, an elimination diet may have adverse consequences to the nutrition of the mother and the child, because the lead to an unbalanced diet and may even promote the onset of an allergy. Elimination diets are meant for the treatment of diagnosed food allergies and should be followed under the supervision of a physician or a nutritional therapist.

**More information is available at:** Current Care Guidelines for allergies

### *Nausea during pregnancy*

Nausea can be relieved by eating several small meals during the day. Too long intervals between meals may increase nausea. Cold drinks and fruit may provide a fresh alternative and alleviate discomfort. Nausea during pregnancy usually occurs as morning sickness, when a long time has passed since the previous meal and blood sugar level has dropped. It is advisable to eat or drink something before getting up from bed; good choices include fruit juice, fruit or berry soup, banana, crispbread, etc.

### *Constipation and indigestion*

Constipation can be reduced by eating food rich in fibre, i.e. whole grains, vegetables, berries and fruit, and by consuming enough fluids. If necessary, bran cereals and dried fruit can be added in the diet to improve bowel regularity. Flaxseed is not recommended as such, ground or soaked for the treatment of constipation during pregnancy or breastfeeding. Exercise increases bowel movement frequency as well. Indigestion is a common problem towards the end of pregnancy. It can be reduced by avoiding hot spiced and fatty foods as well as coffee and strong tea.

### *Gestational diabetes*

#### **MAIN POINTS**

- ▶ Regular meal schedule and blood sugar checked at every meal.
- ▶ Plenty of dietary fibre (at least 32–36 g/day). This can be achieved by eating high-fibre cereal products (fibre content at least 10%) and vegetables (a total of 600 g) at every meal as well as 2 servings of fruit or berries per day.
- ▶ Enough soft fat (total amount of fat 60–80 g/day, with soft fat accounting for at least 2/3). In practice, this is achieved by using margarines that contain 60–80% of fat on bread, oil for cooking, oil-based salad dressings, fish 2–3 times a week and small amounts of almonds, nuts and seeds every day.

Gestational diabetes refers to abnormal glucose metabolism diagnosed during pregnancy by a glucose challenge test. The most common cause is reduced insulin sensitivity during the latter half of pregnancy (insulin resistance for 80% or insufficient pancreatic beta cell function). Gestational diabetes usually manifests itself already during the first pregnancy. An increased risk for the disease is indicated by BMI  $\geq 35$  kg/m<sup>2</sup>, gestational diabetes during a previous pregnancy, glycosuria in early pregnancy, type 2 diabetes in a close relative, oral corticosteroid medication or polycystic ovary syndrome, which are all indications justifying a glucose challenge test on pregnancy.

weeks 12–16. Elevated blood sugar levels during pregnancy may cause foetal overgrowth, placental malfunctions, labour and delivery complications as well as hypoglycaemia in the newborn. The risk for the mother to later develop diabetes increases.

The diet follows the general nutrition recommendations during pregnancy (Chapter 3.2) and the general dietary guidelines for diabetics (<http://www.diabetes.fi/files/308/Ruokavaliosuositus.pdf>). The significance of fat quality and fibre is emphasised in the dietary guidelines of diabetics. The recommended total amount of carbohydrates is slightly lower than for the rest of the population (40–50 E%), and the intake of dietary fibre should be higher (at least 32–36 g/day). This means that bread, hot cereals and meals made from whole grain should be used as sources of hydrocarbons. The amounts in which these as well as fruit and berries are used are assessed on the basis of blood sugar measurements. Vegetables are to be eaten in abundance. Foods that are high in fibre minimise blood sugar rise at meals. Adequate consumption of soft fat (mono- and polyunsaturated fatty acids) improves glucose tolerance. Attention should also be paid to the overall meal composition and the meal schedule. Nutritional therapy requires several guidance visits. The purpose of guidance is to reduce the need for insulin therapy (targeting at normal blood glucose levels), prevent excessive weight gain of the mother as well as foetal overgrowth, and reduce the later risk of disease for both the mother and the foetus.

Maternity clinics have an important task to prevent diabetes already during early pregnancy in case of clearly overweight women. The most important tools include preventing overweight (already when planning for pregnancy), promoting healthy eating habits and increasing exercise. Intensified efforts are needed also after pregnancy to support the mother's weight management. High weight gain

during pregnancy and overweight after pregnancy increase the risk for a gestational diabetic of developing type 2 diabetes. Breastfeeding aids in weight control after pregnancy. Lifestyle guidance for the whole family aims at supporting breastfeeding, preventing the mother from later developing type 2 diabetes and promoting the child's health.

**More information is available at:** Current Care Guidelines for gestational diabetes 2013

### *Elevation of blood pressure*

Elevation of blood pressure is the most common complication during pregnancy, found in 3–8 percent of pregnant women. Gestational hypertension is diagnosed, if blood pressure exceeds 140/90 mmHg or has elevated by more than 30/15 mmHg over the values measured at the beginning of pregnancy. Pre-eclampsia refers to a condition where blood pressure rises after pregnancy week 20 to more than 140/90 mmHg and protein is excreted into urine. The consumption of salt should be avoided and an adequate intake of fluids must be ensured. Pre-eclampsia reflects general susceptibility to vascular diseases and increases the woman's risk of developing coronary disease by 2–3-fold. The disease risk can be affected through lifestyle, such as a diet that promotes heart health.

**More information is available at:** [http://verkkojulkaisu.viivamedia.fi/sydanliitto/ravinto\\_sydanterveyden\\_edistamisessa/8](http://verkkojulkaisu.viivamedia.fi/sydanliitto/ravinto_sydanterveyden_edistamisessa/8)

TABLE 7. Recommendations on food supplements during pregnancy and lactation

Food supplement	Dose/day
Vitamin D	10 µg for everybody all year round
Folic acid	400 µg for everybody planning for pregnancy from about two months before termination of birth control until the end of pregnancy week 12. 4 mg under medical supervision to mothers whose child is at high risk for neural tube defects (Table 6)
Calcium	According to individual assessment: 500 mg, if the diet contains only small amounts of dairy products or foods fortified with calcium. 1000 mg, if the diet is completely lacking in dairy products or foods fortified with calcium.
Iron	According to individual need: 50 mg after pregnancy week 12 for women with Hb of less than 110 g/l during the first trimester or less than 100 g/l later during pregnancy.
Iodine	150 µg, if intake from food is very low (Table 3a)
Vitamin and mineral supplements	As necessary due to a highly unbalanced or restricted diet, severe morning sickness and in multifoetal pregnancies. No overlapping products or products containing vitamin A.

TABLE 8. Calcium intake from food

Food	Serving	Calcium/serving
Milk, yogurt and other fermented products (buttermilk, "viiil")	1 dl	120 mg
Hard cheese	1 slice (10 g)	100 mg
Cottage cheese	1 dl (100 g)	70 mg
Quark	1 dl	85 mg
Plant-based drinks (rice, oats, soy)	1 dl	4–120 mg <sup>1</sup>
Tofu	100 g	130 mg
Rainbow trout	100 g	130 mg
Green bean	100 g	50 mg
Unpeeled sesame seeds	1 Tbsp	80 mg

<sup>1</sup> In fortified products

## TO SUPPORT GUIDANCE

- Emphasise recommended food choices instead of individual nutrients in dietary guidance for pregnant women. When given on the level of foods, guidance is more concrete and easier to implement. It motivates pregnant women to find solutions based on daily food choices instead of dietary products; for example, to choose fish instead of fish oil capsules and fresh vegetables instead of multivitamin preparations.
- Tell the mothers how overweight during pregnancy affects the health of the mother and the child.
- Special attention shall during pregnancy be paid to adequate intake of folate, vitamin D, calcium, iodine, iron and soft fat.
- The use of nutrient preparations is partly incorrectly weighted during pregnancy; the daily 10 µg recommendation for the use of a vitamin D preparation is not fulfilled, but other preparations are used in excess.
- The possibility of overlapping intake shall be taken into account, particularly when multivitamin preparations are used.
- Vitamin A supplementation is not needed: A risk of foetal disorders has been linked to daily vitamin A intake of 3000 micrograms from food supplements during pregnancy. Preparations containing retinol should not be used, while preparations that contain beta carotene pose no risk.





# NUTRITION OF BREASTFEEDING MOTHER



## MAIN POINTS

- ▶ Good nutritional status of the mother promotes recovery from childbirth, coping and breastfeeding success.
- ▶ The mother's diet affects the composition of breast milk, particularly the fatty acids contained in it.
- ▶ A balanced and adequate diet guarantees good nutrition also during lactation.
- ▶ A vitamin D preparation is recommended for all breastfeeding women with a daily dose of 10 µg.
- ▶ Multivitamin-mineral preparations are only needed to support an unbalanced diet or for mothers who donate breast milk, are breastfeeding twins or get pregnant again immediately.
- ▶ Breastfeeding aids in the mother's weight control after pregnancy.

The fat composition of the mother's diet is reflected in a matter of hours in breast milk. The change is not permanent and thus the good quality of fat is a daily concern.



## 4.1 Effect of food on mother's well-being and composition of breast milk

A diet that promotes the health of the family is well suited also during lactation. The good nutritional status of the mother promotes recovery from childbirth and success of breastfeeding. The significance of the mother's own diet is particularly emphasised during a prolonged breastfeeding period. Breastfeeding will not deplete the mother's nutrient stores, provided she eats a balanced diet and adequate quantities. Nutrient-specific intake recommendations during lactation are presented in Annex Tables 5–6 and recommendations on food supplements during pregnancy and lactation in Table 7 on page 54.

Breast milk is rich in essential fatty acids, provided the mother eats enough soft fat. Adequate intake of fatty acid is crucial for the development of the child's nervous system and vision, for example, because during the first months the baby's own production of fatty acids has not yet developed. The mother can ensure that her breast milk has an adequate content of fatty acids essential for the child by using margarine on bread, rapeseed oil or a fluid vegetable oil based preparation/fat blend for cooking and oil in salad dressings, and eating fish at least 2–3 a week. Seeds and nuts are a good addition to the diet. The long-chain fatty acids contained in fish are also beneficial to the health of the mother and the child. Full grain products and vegetables

in the mother's diet increase the level of vitamins, particularly vitamins B and C, in breast milk.

## 4.2 Healthy eating in everyday life with a baby

Securing the well-being of the whole family lays the foundation for the well-being of the child. A newborn baby can steal the attention away from the mother's own welfare. It is important that the partner or some other support person is involved in the everyday life. The mother is emotional after childbirth, she may be tired and does not necessarily have the strength to look after her own meals or the meals of the family in addition to everything else. Breastfeeding and not sleeping at night change the rhythm of life for the family, and it takes time to learn how to care for the baby and to get accustomed to the new situation. Postnatal depression may also increase the need for support. Home visits by maternity clinic nurses are particularly necessary, when the baby is the first child in the family, the mother is a single parent or there are some other challenges in the family due to e.g. illness or unemployment. Families with multiple children may also find their resources inadequate and need

Physical exercise of moderate intensity does not affect lactation or the quality or quantity of breast milk, so exercise can be safely continued also after childbirth.



in-home services. The situation can be prepared for before childbirth by cooking and baking foods to fill the freezer, and by taking advantage of convenience foods.

### *A healthy diet*

The energy expenditure of the mother is affected by the amount of breast milk and accumulated body fat. The higher the amount of body fat, the less the mother needs extra energy from food. The extra need for energy is about 2.0 MJ (500 kcal) per day. Mothers who donate breast milk or are breastfeeding twins have a higher than average need for energy. After a six-month period of breastfeeding the energy need does not increase anymore, because the child starts to eat other food, which usually results in a decrease in the amount of breast milk. Lactating mothers usually have a good appetite making them increase their food intake naturally to match their need. Breastfeeding mothers should eat with regular intervals. If attention is not paid to this, eating is easily replaced with snacking and the baby's needs determine the daily rhythm.

The extra energy needed for lactation can be obtained in a healthy way by eating e.g. a couple of potatoes, a glass of fat-free milk, a piece of fruit, two slices of bread and a serving of salad. If the mother is tired and not eating properly, she may benefit from more frequent meals and an increased intake of fluids. Fresh vegetables, berries and fruit

may also improve her appetite, and rest, outdoor exercise and help with childcare are often necessary elements to help the mother recover.

### *Weight control*

Breastfeeding increases energy expenditure a lot and thus supports the mother's weight control efforts, but weight gain is possible also for breastfeeding women despite the high expenditure of energy. The new family situation, possible reduction in physical activity and changes in eating habits may promote weight gain. The life situation should be assessed as a whole together with the family, trying to find ways to promote proper eating, adequate rest and increased exercise.

After breastfeeding is terminated, the target is normal weight. Factors to be considered when specifying the target weight include the mother's weight prior to pregnancy, weight gain during pregnancy and the duration of breastfeeding. If weight gain has been large or the duration of breastfeeding is very short, the weight will not necessarily drop to the pre-pregnancy weight during breastfeeding.

**More information is available at:** [http://www.ukkinstituutti.fi/ammattilaisille/terveysliikunnan-suositukset/liikunta\\_synnytyksen\\_jalkeen](http://www.ukkinstituutti.fi/ammattilaisille/terveysliikunnan-suositukset/liikunta_synnytyksen_jalkeen)



Community promotes the well-being of a family with a baby, and friends and family can e.g. do the shopping for groceries or help with cooking.

### *Fluids*

Breastfeeding increases the need for fluids in proportion to the amount of secreted breast milk. However, the amount of breast milk cannot be increased by increasing the intake of fluids, because the body adjusts the fluid balance according to intake. Suitable beverages include water, fat-free milk and buttermilk, tea and low-sugar diluted squash drinks. Coffee can be consumed in moderation. Drinking plenty of coffee may cause restlessness in the baby, because part of the caffeine will be transferred to the breast milk. When breastfeeding at night, water is the best beverage choice. Beverages that contain sugar easily cause dental caries, because the buffer capacity of the saliva is less effective at night than during the day.

### *Alcohol*

Alcohol does not promote lactation and no safe limit can be specified for the alcohol consumption of a breastfeeding woman. For this reason, alcohol consumption should be avoided for the duration of breastfeeding. The use of alcohol when breastfeeding has an adverse effect on the interaction between the mother and the child. The alcohol level of breast milk parallels that in the mother's circulation, but the baby's liver is not yet able to process alcohol as efficiently as the liver of an adult. Alcohol is not stored in the mammary glands, so the alcohol level of breast milk decreases at the same rate as the blood alcohol level. Alcohol level is at its highest in breast milk 30–60 minutes after consumption.

Alcohol ingested by a breastfeeding mother may cause drowsiness in the baby, reduce the amount of active sleep and shorten the baby's longest sleep period. The mother's alcohol consumption can also cause the baby to eat less and thus cause slower growth. Guidance related to alcohol and breastfeeding shall be provided on an individual basis taking the life situation of the family into consideration. About six percent of Finnish mothers are substance dependent.

### *Mother's diet and allergies*

There is no need to eliminate any foods from a breastfeeding mother's diet to prevent the child from developing allergies. Indeed, unnecessary restrictions may even increase the risk of food allergies. When the mother follows a balanced diet, the child is suitably exposed to different foods and this supports the development of the child's defence mechanisms. Mothers who have suffered from a food allergy before having the baby shall follow their own diet also when breastfeeding.

Breastfeeding should be continued even if the child develops an allergy to the foods eaten by the mother during the breastfeeding period. If a breastfed child manifests allergy symptoms, it is important to carefully identify the cause of the symptoms. Allergies can be caused by also other factors than the mother's diet. Children can have a variety of symptoms: constant crying, colic, frequent wet burps, broken sleep, diarrhoea or eczema. However, the mother's diet should not be restricted unnecessarily and randomly, because a restricted diet can cause major physical and mental stress. If some key foods need to be eliminated from the diet, the mother shall be referred to a nutritional therapist.

## TO SUPPORT GUIDANCE

- Partners are to be encouraged to assume responsibility for the food management of the family.
- Studies have shown that mothers follow a healthier diet during pregnancy than during the breastfeeding period. For this reason, special attention shall be paid to empowering and motivating nutrition guidance for the duration of breastfeeding.





# INFANT NUTRITION: FROM BREASTFEEDING TO FAMILY MEALS

## MAIN POINTS OF THE DIET OF A 0–1-YEAR OLD INFANT

- ▶ As concerns the nutrition of an infant, the important thing is to observe and identify the child's hunger, satiety and contentedness.
- ▶ Sensitive and mutual interaction between the child and the parent helps parents feel confident that they are capable of feeding their child well.
- ▶ Immediately after birth, babies are breastfed according to their natural feeding rhythm. In normal breastfeeding, there are periods when the baby eats more frequently to increase the secretion of breast milk to match the baby's need. It is important that help is given to families quickly in case problems occur.
- ▶ Exclusive breastfeeding is recommended until the age of 4–6 months. For full-term and normal weight babies, breast milk is sufficient as the only form of nutrition until the age of six months, except for vitamin D.
- ▶ It is recommended that breastfeeding is continued till one year's age, and even longer, if the family so wishes.
- ▶ Infant formulae have been developed for under 6-month old infants who are not breastfed or do not get enough breast milk. A corresponding product designed for infants aged 6–12 months is called follow-on formula.
- ▶ Solid foods can be introduced to the child in tasting portions at the age of 4–6 months at the earliest.
- ▶ Tasting portions are served after the child has been breastfed, and breastfeeding is continued according to the child's natural feeding rhythm.
- ▶ All children need solid food from the age of 6 months onwards. For children who do not get breast milk at all, solid food is started at 4–6 months of age.
- ▶ At six months, children already participate in the mealtimes of the family, tasting foods that are suitable for small children. They gradually start to eat without help, using their fingers. Children are started on pureed food.
- ▶ A 10 µ/day vitamin D supplement is given to children from the age of 2 weeks.



The baby's first year is a short time in the adult's life, but is of huge importance to the child.

## 5.1 Breastfeeding

Breast milk is the best nutrition for an infant and contains all the nutrients needed by the child, with the exception of vitamin D. Breast milk is adequate as sole nutrition for most normal-weight babies during the first six months of life. Exclusive breastfeeding, aka full breastfeeding, is recommended until the age of 6 months, or at least until the age of 4 months.

In Finland, the average duration of breastfeeding is 7–8 months, with exclusive breastfeeding lasting for 2 months. Only 1–2 percent of children are breastfed exclusively until the age of 6 months. Most children get a milk supplement already on their first days while in the maternity hospital. The special challenge faced in Finland is to support the start of breastfeeding at an early stage as well as the implementation of exclusive breastfeeding until the age of at least 4 months. Even with babies who are fed infant formula during their first months, it is beneficial to start exclusive breastfeeding at a later stage.

### *Factors affecting breastfeeding success*

Breast crawl refers to the moment right after birth, when the baby is active for a few hours and spontaneously tries to find the breast. The baby will get a few drops of the valuable colostrum. The breast crawl alone will start the secretion of breast milk. The first hours and days after birth are crucial to successful breastfeeding. The nursing practices fol-

lowed in the maternity hospital affect the success of breastfeeding. Rooming-in care, skin contact, avoiding unnecessary supplement milk and other fluids, avoiding pacifiers and bottles, as well as personal support and guidance promote the start of exclusive breastfeeding. Pacifiers are inadvisable only at the learning phase of breastfeeding. Milk supplement is to only be given on medical grounds and the mother must be told what kind of supplement is given to the baby.

A written and consistent action plan for promotion of breastfeeding, covering the whole care chain during the breastfeeding period, shall be prepared for every maternity hospital and clinic. The practices to be followed in guidance and care as well as the breastfeeding support available in the area must be agreed on in maternity hospitals and clinics.

After discharge from the hospital, continued breastfeeding is promoted particularly by the support of the partner, the rest of the social network, and the maternity clinic and child health clinic. Supporting the success of breastfeeding is an important task for maternity clinics and child health clinics and the practices followed in maternity hospitals and clinics shall be consistent. It is of particular importance that guidance is available in case problems occur. Most problems can be eliminated by means of a good breastfeeding technique, accessories and support from the family. This requires that all public health nurses working in maternity clinics and child health clinics have had training in breastfeeding guidance. Breastfeeding guidance is part of nutrition guidance and integrated in the carefully executed periodic health inspections at the clinics, home visits and parent group activities. A pre-condition for individual breastfeeding guidance is that appointment times are long enough to make an in-depth processing of breastfeeding problems possible. Mothers who need support are offered extra visits to the clinic.



## Benefits of breastfeeding

◆ *Many nutrients are better absorbed from breast milk than from formulae. Breast milk promotes the development of the child's defence system and the maturing of the intestines thanks to its useful ingredients that increase infection protection and prevent infectious reactions, for example. Breast milk has a beneficial effect on the formation of microbes in the child's intestines.*

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Iron absorption is 50–70% from breast milk, 10–30% from cow's milk and 5–10% from formulae. The absorption of iron is enhanced by the lactose, lactoferrin and vitamin C contained in breast milk. Exclusive breastfeeding and the good iron stores of full-term babies at birth protect the child against anaemia, but after the age of six months other sources of iron are needed: meat, fish and whole grain cereals.

◆ *Breastfeeding promotes early interaction between the mother and the child. Breastfeeding is also economical and environmentally friendly. Breastfeeding promotes recovery from childbirth and helps the mother gain normal weight after childbirth. Breastfeeding also has beneficial effects on the mother's later health.*

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## Breastfeeding guidance

Breastfeeding guidance is started already during early pregnancy, because at the later stage of pregnancy the mother focuses more on the birth. In family coaching during pregnancy, realistic

Partial breastfeeding in addition to other food is also beneficial to infants in nutritional terms and develops their defence system.




information is provided about breastfeeding and the key factors affecting the success of breastfeeding are discussed. They include the positive attitude of the mother and her partner towards breastfeeding as well as good knowledge about breastfeeding and how lactation is started, the mother's own decision to breastfeed the baby, as well as earlier breastfeeding experience.

As breastfeeding does not start in the same way for all mothers and the situation cannot be practiced until the baby is born, enough time shall be reserved for guidance in the maternity hospital as well as during clinic visits and home visits. The relationship formed between the mother and the infant in breastfeeding is unique, because babies are different in temperament and breastfeeding is an individual experience with every child. It is natural that with the first child, in particular, finding the proper latch and nursing positions takes time and requires practice and support.

The baby is breastfed according to the baby's own rhythm, i.e. according to the baby's cues. This way the secretion of milk is adjusted according to the baby's needs. The baby adjusts its sucking based on its own need for nourishment. The baby is first allowed to suck one breast completely empty. The other breast can then be offered to the baby. At the next feeding time feeding is started with the other breast.



In addition to public health nurses and midwives, breastfeeding support is provided also e.g. by breastfeeding support clinics as well as by breastfeeding support helplines and breastfeeding support groups.



Help must be quickly available in case of breastfeeding problems from child health clinics and maternity clinics.

Every now and then the infant will nurse more frequently for a few days and this increases the secretion of breast milk to match the baby's needs. In the early weeks, frequent breastfeeding is important, particularly also at night, to ensure proper start of lactation. This means that the child should be breastfed 8–12 times a day. Breastfeeding intervals vary individually.

The adequacy of breast milk is assessed on the basis of the infant's general condition and excretions. About five wet diapers and regular bowel movement are indications of adequate nourishment. For exclusively breastfed infants, inadequate weight gain identified by the clinic, limited amount of urine and faeces as well as hunger cry and restlessness even after frequent breastfeeding indicate that breast milk is not enough as the sole source for nutrition. A public health nurse with training in breastfeeding guidance is able to assess if the baby is growing well and to ensure that the baby is not ill. The nurse also assesses whether enough breastfeeding guidance and coping support has been provided to the family, and if the breastfeeding technique is correct.

The mother's medication only rarely precludes breastfeeding. Some medicines, drug abuse and heavy drinking prevent breastfeeding. With some medicines the continuation of breastfeeding must be assessed specifically in each case.

Information about the safety of medication during pregnancy or breastfeeding can be obtained from the Teratology Information Service. This national service is open 9–12 on weekdays, tel. (09) 4717 6500.

### *Sudden termination of breastfeeding*

All mothers are not allowed to breastfeed and sometimes breastfeeding success cannot be achieved despite the mother's wishes, or breastfeeding may have to be terminated before the mother would like to terminate it due to e.g. the mother's medication, illness, work situation or an illness of the child. The public health nurse must be able in these situations to support the mother, telling her that failure of breastfeeding will not make her a bad mother or hurt the baby. Bottle feeding with a close contact to the baby also promotes natural interaction and in some cases the introduction of infant formula may support the continuation of partial breastfeeding as it decreases the performance pressures of the mother. The nurse must reserve enough time for the processing of the mother's experiences and feelings in a spirit of encouragement and acceptance to stop the mother from feeling unnecessary guilt over the termination of breastfeeding.

### *Weaning*

When to stop breastfeeding is a decision that every family makes by themselves. The public health nurse provides advice on terminating breastfeeding in steps as the child's diet becomes more varied. This results in lactation stopping gradually. If the child wants to discontinue breastfeeding before the time planned by the mother, for example, it is important to process the experiences and feelings related to breastfeeding and its discontinuation with the family. This is significant to the success of breastfeeding with the next child. If breastfeeding continues for more than a year, it is important that the child has a balanced diet in addition to breast milk, and eats at mealtimes together with the rest of the family.

## 5.2 Infant formula and other beverages

If breast milk is not enough for the child despite more intensive breastfeeding, if the mother wishes to stop breastfeeding or if breastfeeding has to be discontinued for medical reasons, the child is transferred onto infant formula. It is advisable to discuss with the family to make sure that the use of formula is not started for reasons that could be corrected, such as lack of breastfeeding guidance. If the child is put completely on formula, the parents need guidance in how to use formula and how to start solids.

The composition of infant formula is as close as possible to the nutrient composition of breast milk. Regular cow's milk loads the kidneys of children under 1 year of age due to the high protein content of the milk. In infant formula, the quality of protein and fat has been modified according to the needs of an infant, and it contains more lactose, vitamins and minerals than cow's milk. Owing to these modifications, infant formula and follow-on formula are suitable for infants unlike regular cow's milk, plant-based milk-like beverages, such as soy, oat, rice and almond drinks, and home-made milk mixtures. The formula shall be prepared and handled in compliance with the instructions provided on the package.

Table 9 presents indicative amounts of infant formula and follow-on formula at different ages, but as with breast milk, also infant formula is to be given according to the child's cues. The use of formulae is terminated at the age of one year, when the child can start drinking regular fat-free milk.

TABLE 9. Indicative amounts of infant formula and follow-on formula

Age in months	Amount of infant formula (1–6 mo) and follow-on formula (6–12 mo) ml/day
0–1	500–600
1–2	600–800
2–3	700–1000
3–5	700–1200
5–6	700–1000
6–8	600–800
8–12	600

### Water and juice

In exclusive breastfeeding, infants do not normally require water, because they can satisfy their need for fluids with breast milk. No additional fluids are necessary for babies even in hot weather, but they can be breastfed more frequently. Water given to infants need not be boiled. No fruit juices or juices made from concentrate are needed in the diet of an infant under one year of age. They are harmful to teeth and accustom the child unnecessarily to sweet beverages.

## 5.3 Starting solid foods


### *Tasting portions at the age of 4–6 months*

The baby's intestines mature gradually after birth and are not ready to handle new foods until at the age of four months, at the earliest. For exclusively breastfed infants, the introduction of solids at 4–6 months of age along with breast milk supports the maturing of the intestines and the development of tolerance to new foods. With healthy babies who are growing well, solids are started in tasting portions (from just a pinch to a few teaspoons) at the earliest at 4 months and at the latest at 6 months. Solids given in tasting portions do not replace breastfeeding sessions, but breast milk is still the primary nutrition for the child. From the age of 6 months onwards, infants need solid foods to supplement breast milk in order to safeguard their growth and development. Waiting until six months before introducing solid foods may increase susceptibility to allergies. Prolonged exclusive breastfeeding, for more than six months, may also result in deficiencies in certain nutrients, such as zinc, iron and protein.


### *When breast milk is not enough*

If an infant after four months of age needs other food in addition to breast milk, it is better to start solids than to transfer to an infant formula, in order not to cause lactation to stop and to ensure that partial breastfeeding is continued. For infants fed exclusively on formula, solid supplementing foods are started at about the age of 4 months, depending on how ready the individual baby is to eat solids.

The introduction of foods is started at the end of a breastfeeding or formula feeding session by offering the child tasting portions. Infants do not need



No solids are given to infants under four months of age.



Tasting portions are given at the end of a breastfeeding session.

cereal milk products at any stage, and particularly not under the age of 5 months, because cereal milk products started at an early age may result in the reduction and termination of breastfeeding. For infants older than 5 months, porridges with a thicker consistency are better suited for learning to eat solid foods.

### *From breast milk to solids*

In terms of motor development, an infant is ready to eat solid foods, when they are able to sit up with support, control their head movements and coordinate their eyes when reaching for foods with their hands. The child becomes interested in family mealtimes and follows with the eyes the other family members who are eating. Oral motor skills develop, when solid food is offered to the infant and they learn how to transfer food with their tongue towards the pharynx. This usually happens at the age of 4–6 months.

Tasting portions can be given to the child along with breast milk from the age of 4–6 months. Tasting portions do not compete with breastfeeding.

All infants are given solid foods from the age of 6 months onwards.

When the whole family follows a regular mealtime schedule and a healthy diet, it is easy for the child to join the common mealtimes from the very start and, as far as possible, eat the same foods as the rest of the family.

The introduction of solid foods to a baby starts with small amounts at a time. New tasting portions can easily be made from the family's normal food before salt and spices are added. Suitable first foods include mild basic flavours, for example boiled potatoes and vegetables, berries, fruit and hot cereals. Solid foods can be liquefied into loose purees by adding water or breast milk in them. From the very beginning, infants should be offered a variety of new foods.

The infant's food selection is expanded by adding cereal meals and other cereal products, as well as fish, chicken and meat. There is no need to delay trials with any foods, even in families with allergies. Foods and beverages high in sugar or salt should not be given to infants before the age of one year. Regular fat-free milk is a suitable choice for mealtime beverage starting at one year, and fermented milk products starting at 10 months. Children do not need the milk products intended for 1–3-year olds or flavoured milk products either, but can start to drink regular fat-free milk at about the age of one year.



### *Eating practice*

Children have a natural aversion to new tastes, the bitter and sour tastes found in e.g. vegetables. Children need to taste new foods repeatedly, before they learn to like them. The same taste should therefore be offered several times to ensure that children learn to appreciate a wide selection of tastes. Parents should not jump into conclusions about the child disliking some foods, because usually it is only a question of the child being unaccustomed to that taste.



Every family is entitled to breastfeeding support at the correct time and according to the individual situation

Children should be allowed to practice eating without help from the very start. Once the child is able to hold utensils, they can be given their own spoon and fork, even if actual eating takes place with an adult's assistance. The child can be given e.g. pieces of rye bread crust or root vegetables to practice grabbing them with the fingers and lifting them into the mouth. For such finger food, only foods that do not disintegrate into pieces should be given to avoid the risk of choking. Small items of food, such as berries, corn and rice, are good for practicing the pincer grasp. The coarseness of pureed food can be increased, as the child's oral motor skills develop and teeth erupt. As the infant approaches the age of one year, their food can for the most part be of the same consistency as the food eaten by the rest of the family. The food only needs to be mashed or cut into pieces on the plate. If commercial infant foods are used, products with a coarser texture should be preferred over pureed food.





Families are guided to start solid foods according to the baby's needs, fine motor skills and interest, supporting continued breastfeeding.



FIGURE 8. Increasing variety in an infant's diet.

TABLE 10. Learning phases in eating, the development target and an infant's food choices at different ages during the first year.

Age, months	Learning phase in eating and development target	Food choice
0–4	Exclusive breastfeeding, if possible (good latch and nursing position). Feeding according to baby's natural rhythm in both breastfeeding and bottle feeding, observing baby's cues of hunger and satiety.	Breast milk or (if breast milk not available) infant formula.
4–6	Supporting continued breastfeeding Tasting portions at 4 months at the earliest and to all babies at 6 months at the latest. Child learns basic tastes and practices oral motor skills with different foods. Words introduced at mealtimes by naming foods and talking about food (food talk).	Foods individually in small tasting portions, with breastfeeding continued according to the baby's natural rhythm. Vegetables, berries and fruit. From 5 months at the earliest, cereal products, chicken, fish, meat and egg.
6–10	Increasing variety in diet, ensuring continued breastfeeding. Familiarising the child with basic tastes (sour, bitter) and different textures through a wide variety of foods. Giving the child suitable eating from family meals to create a natural entry to the family's food world. Finger food and use of a mug develop the pincer grasp and provide practice in eating with hands. Food talk and naming foods. Eating together.	A variety of pureed supplementing food and finger food to all children, increasing the portion size according to the baby's needs and continuing breastfeeding. Food choices include vegetables, berries, fruit, and products from the cereal and meat groups.
10–12	All food groups represented, increasing variety of foods. Food of coarser texture, chewing practice. Child eats without help using hands/feels foods with hands, uses a spoon and a mug. Regular shared meals, naming foods. Breastfeeding continued till the age of one year, and longer if the family so wishes: combining breastfeeding with family mealtimes.	Foods suitable for the child from family meals. Texture of foods becomes gradually coarser. Introducing milk products with plain fermented preparations. Regular milk used in cooking. Fat-free milk can be used as a beverage from the age of one year. Gradually adopting the regular meal schedule of the family. Examples of meals: 1. Breakfast: porridge + a serving of berries/fruit 2. Lunch: vegetable/fish/meat food with fresh grated vegetables/salad 3. Snack: e.g. a serving of berries/fruit 4. Dinner: vegetable/fish/meat food with fresh grated vegetables/salad 5. Supper: porridge + a serving of berries/fruit  At other times the child is breastfed or given follow-on formula according to the child's cues.



TABLE 11. Encouragement list: foods suited to the diet of under 1-year-old children

Food	Potato and vegetables	Berries and fruit	Cereal products	Meat, fish and egg	Milk and dairy products	Dietary fats
Raw materials	potato, carrot, cauliflower, broccoli, maze, Brussels sprout, cucumber, parsnip, peas, lentils, beams sweet potato, Jerusalem artichoke, tomato, swede, turnip, romanesco, utilising frozen vegetables	strawberry, raspberry, blueberry, currants, gooseberry, cloudberry, sweet detar, lingonberry, rose hip, apple, banana, plum, pear, apricot, citrus fruit, melons, mango	oats, rye, wheat, spelt, rice, buckwheat, cornmeal, millet, with whole grain cereals as the preferred choice	unseasoned chicken, turkey, pork, beef, lamb and mutton, reindeer, venison, other game meat, fish (vendace, pollock, white-fish, farmed rainbow trout and Norwegian salmon), egg	> 10 months fat-free or low-fat products: plain yogurt and other fermented products (buttermilk, "villi"), quark, milk in cooking when heated  closer to 1-year-age, fat-free milk for drink	breast milk and infant formula ensure adequate intake of fat for infants under 1 year of age.
Preparation methods	at first cooked and pureed, from 6–10 months uncooked and grated	pureed, uncooked and grated, kissel with uncooked berries	from 5 months porridges made from rolled, pearled or milled cereals; rice and pasta in purees	from 5 months, starting with ground meat, in 1 teaspoon portions per one serving of pureed food during familiarisation period, and later ca. 1–1.5 Tbsp.	from 10 months berries and grated fruit can be added in unflavoured dairy products	rapeseed oil can be added in pureed food or porridge, if necessary
Finger food selected according to the development of motor skills and number of teeth	uncooked vegetables, such as cucumber, carrot, cooked vegetables, such as corn	berries as such; fresh fruit, e.g. apple	crispbread, cooked rice or macaroni	hamburger patties, ground meat, scrambled eggs in pieces, tofu	cottage cheese	



Vegetables can be presented in a fun way to encourage tasting and to bring colour and cheerfulness to the table.



## TO SUPPORT GUIDANCE

- Information about breastfeeding is made available to all families, explaining about the benefits of breastfeeding already on the first visits to the maternity clinic. A motivating interview of the family is conducted to encourage and support breastfeeding, taking the cultural background of the family into consideration.  
.....
- Breastfeeding is a sensitive issue that raises emotions. It is important that breastfeeding guidance is given with sensitivity on an individual basis with the mother and the family, providing encouragement and support to the mother in strengthening her self-confidence and finding the correct breastfeeding technique.  
.....
- Peer support groups are a good source of enhanced support to people from different cultural backgrounds, for example.  
.....
- Mothers are encouraged to an exclusive breastfeeding duration of at least four months. They are advised to find breastfeeding solutions that suit their own family, so as to ensure that breastfeeding is not discontinued too soon.  
.....
- Families are advised to contact a public health nurse with any questions and concerns they may have. Public health nurses provide individual guidance and support, and if necessary, refer the family further (to e.g. breastfeeding support groups, nationwide breastfeeding helpline).  
.....
- Discussions about the use of infant formula are conducted without making the family feel guilty.  
.....
- Starting solid foods at the right time and according to the child's needs is discussed with the family.  
.....
- The focus in the nutrition guidance of families is to support the development of a regular and healthy eating culture for the whole family, allowing the child to join the family for shared meals as soon as solid foods are introduced, eating as far as suitable the same food as the rest of the family.  
.....





# NUTRITION FOR TODDLERS AND YOUNG SCHOOL CHILDREN

## MAIN POINTS

- ▶ Adults make decisions on mealtimes and restrictions: what to eat and drink, even if the children would like something else.
- ▶ Children can make minor decisions, such as whether to have a yogurt or “viili”.
- ▶ A regular mealtime schedule supports children’s natural eating regulation.
- ▶ Children are allowed to participate in food-related activities: shopping, cooking, baking, setting the table and clearing up after meals.
- ▶ The family eats together at mealtimes, with adults acting as role models for children.
- ▶ Children are praised and encouraged. Positive and desirable points are acknowledged, any mess is cleared up without fuss.
- ▶ A vitamin D supplement is recommended from 2 weeks till 2 years of age at a dose of 10 µg, and for 2–18-year olds at a dose of 7.5 µg per day, all year round.



Adults decide what is eaten and when, children can regulate the quantity they eat.



Children eat what they like. They like what they know. They learn to know what they are served often.

### *Eating together promotes variety of diet*

The main task of the adults is to ensure that an appropriate eating schedule is followed and healthy food is available to the children. During the first year, the infant begins to eat together with the rest of the family at regular shared mealtimes (Chapter 2). Regular family meals together with adults create security to the child and give structure to the daily schedule. At the same time, the children are provided with a model of a balanced meal. It is important that children learn to eat a healthy and varied diet from an as early age as possible, because it is difficult to change taste habits later.

Neophobia, the dislike of new foods, is typical particularly in children of about 2–3 years of age. On the other hand, children like to experiment and familiarisation with new foods can be reinforced on the child's own terms. New foods can at first be studied together by looking, smelling and feeling. It is estimated that children need to try new foods and tastes 10–15 times to get accustomed to them. Children will accept new foods easier, if they are served together with a familiar food and they see adults or siblings eat the same food. Children should be allowed to experiment with all their senses. If toddlers are given a free choice of food, they choose foods that they know.



These then become their favourites, which easily results in an unbalanced diet. It is important to offer a wide variety of foods, even if the child does not yet eat all of them. Children's eating habits develop gradually.

## 6.1 Variations in appetite and picky eaters

Children's appetite varies from one day and season to another. Their energy expenditure and appetite are influenced by e.g. their growth rate, outdoor activities, changes in the daily schedule, amount of sleep and health. There are considerable differences between children of the same age and comparison of children should be avoided, particularly within earshot of the children themselves.

An irregular eating schedule or replacing meals with beverages can easily disturb children's sensitive regulation of appetite and make them susceptible to eating problems. Children do not eat the same amount of food at every meal; instead they adjust their energy intake by eating less at the next meal after a high-energy meal. Healthy children will not come to any harm, if they eat less from time to time. If the child has no appetite at lunch, maybe they will eat more at dinner or the next day. Parents should not interfere with the child's natural satiety regulation by trying to tempt them to eat more or insisting they clean their plates. On the other hand, parents should respect the eating speed of the children and stay at the table long enough to ensure that the children eat as much as they want to.

With toddlers, picky eating or eating problems can be related to their normal development of independence and the adults' conflicting wishes. Children can then become pickier than normal or refuse to eat to get attention. Quite a large share of toddlers are choosy about their food, but this does not usually lead to any growth concerns. Children who are choosy eaters receive a higher intake of energy from snacks and less from the main meals than other children, and therefore it must be especially ensured that the snacks of pickier eaters are balanced. Children's eating problems are often linked

with interaction in the family and can have adverse effects on the lives of the child and the family for a long time and in many ways before growth and weight development are identified as concerns. It is therefore important to examine not only the weight and height of the child, but also how the child and the family are feeling in general, as well as interaction in the family and the child's behaviour in different situations. Children should not be forced to eat on days when they have no appetite, because forced eating may result in aversion to food and to the eating situation.



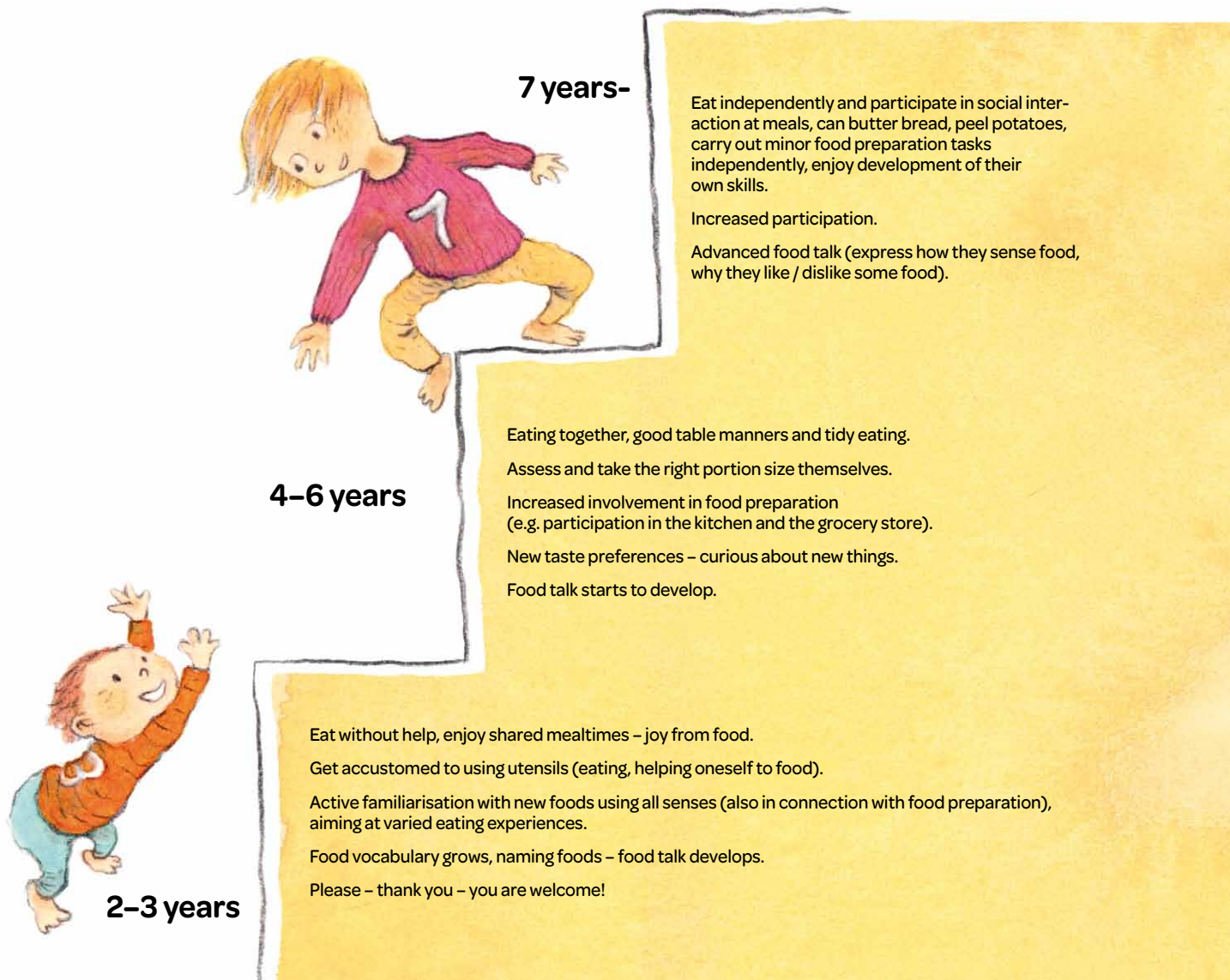


FIGURE 9. Phases of learning to eat for toddlers.



## 6.2 Weight management

### Screening for overweight

The body mass index limits for overweight and obesity have been defined for adults according to the health risks involved in overweight. Since overweight very rarely causes any health problems in childhood, different grounds are used to determine overweight in children. In the screening of overweight children based on the body mass index, the objective is to identify the children who will be overweight adults, unless their weight development changes. Toddlers and young school children who are just over the screening limits do not appear overweight and their weight has no adverse effects at that point. However, they will benefit from increased lifestyle guidance designed to prevent health problems related to overweight in adulthood.

Obesity impairs the child's quality of life. It is a risk factor for metabolic syndrome, insulin resistance, type 2 diabetes and fatty liver. Childhood overweight also increases the risk of obesity and illnesses related to obesity in adulthood. As it is easier to prevent obesity than to have to treat it, children at risk of becoming obese should be identified at an as early stage as possible.

Treatment for obesity is started, when

- the child is obese,
- the child is overweight and the weight gain continues, or
- the child's weight is on the increase and family background causes special susceptibility to obesity-related illnesses (such as cardiovascular diseases, type 2 diabetes).

TABLE 12. Criteria for overweight and obesity in children (Current care guidelines for obesity (in children) 2013)

	Overweight	Obesity
Height weight < 7 yr	10–20 %	> 20 %
Height weight ≥ 7 yr	20–40 %	> 40 %
ISO-BMI (≥ 2 yr)*	25–30 kg/m <sup>2</sup>	> 30 kg/m <sup>2</sup>

\* For children over 2 years of age, ISO-BMI (body mass index corresponding to adult BMI) refers to the expected adult BMI of the child, if their BMI stays on the same level in comparison with other children of the same age.

### Weight management is a family matter

The issue of a child's weight is to be brought up with the parents showing respect, and avoiding placing guilt on the parents. Weight management for children requires that the child and the family are willing and have the resources to change their lifestyle. With families in a high stress situation, the start of weight management can be postponed and the family referred to social or mental support services. The objective of weight management is the well-being and health of the child, permanent lifestyle changes as well as prevention and treatment of conditions related to obesity. The target weight is individual. For children, an adequate target is usually to prevent further weight gain, whereby they become slimmer as they grow taller. In severe cases of obesity or related conditions of obesity, a slow reduction in weight is aimed at.

Weight management is based on lifestyle changes: changes in eating habits, increased physical activity and reduced passive periods (screen time) as well as securing sufficiency of rest and sleep. It is

also important to support the mental well-being of the child. The need for lifestyle changes is affected by the child's age, weight development, degree of obesity and the risks and adverse effects of obesity. Changes in eating habits are essential to weight management. A regular meal schedule, health-promoting food choices and portion sizes based on age are recommended for the whole family.

In order to be able to suggest lifestyle changes, information is needed about the existing habits of the child and the family. Attention is drawn to existing habits that are good and they are further reinforced. Parents are encouraged to change the daily lifestyle of the child (and the family) gradually, using methods that support the making of changes. Such methods include realistic and concrete targets for change, observation of behaviour (e.g. food and exercise records), changes in the environment to facilitate weight management, the role model impact of parents as well as the praising and encouragement of the child.

It takes time to adopt new habits, often up to several years. It is common to fall back to old habits every now and then, but this can be used as an opportunity for learning. Weight management counselling requires multidisciplinary efforts over an adequately long period of time. A structured treatment programme may make guidance easier. Children are referred to specialised healthcare in accordance with the regional healthcare chain (severely obese children and children for whom further examinations are needed for the differential diagnostics of obesity, or who have diseases related to obesity). In an ideal case the expertise of healthcare is utilised in planning and developing the children's living environment (e.g. day care, school) to promote healthy eating habits, physical activity and mental well-being.

### Recommendations for physical activity

- **Children under school age: at least two hours of brisk physical activity every day (Recommendations for physical activity in early childhood education 2005).**
- **Children at school age: at least 1–2 hours of versatile and age-suitable physical activity every day (The Young Finland Association 2008).**
- **Screen time at most 2 hours per day.**
- **National recommendation to reduce sitting time: Sit less, feel better, at: <http://urn.fi/URN:ISBN:978-952-00-3726-0>**



Adequate sleep: 9–10 hours per day  
– waking up refreshed in the morning.

## TO SUPPORT GUIDANCE

Weight management counselling can be targeted according to the age and developmental stage of the child and provided only to the parents, the parents and the child together, or to the youth (Table 13).

- Main points of guidance on changes in eating:
  - regular and even mealtime schedule
  - health-promoting food choices
  - portion size according to age and reduction of energy intake from meals.
- The parents and the child define the lifestyle changes they are willing to make.
- Parents often fail to notice that the child is becoming chubby. The child's weight development can be demonstrated by means of a growth chart and the ISO-BMI (body mass index in adulthood). A tool for calculating the body mass index can be found in the health care library (Terveyskirjasto).
- Written and pictorial material suitable for weight management counselling is available on the websites of e.g. the Finnish Diabetes Association (Diabetesliitto), the Finnish Heart Association (Sydänliitto) and the Association of Finnish Nutritional Therapists (Ravitsemusterapeuttien yhdistys).
- Forms for the determination of lifestyle:
  - Handbook for child welfare clinics:
    - eating habits: [http://www.thl.fi/fi\\_FI/web/lastenneuvola-fi/ohjeet/menetelmat/hyvinvointi/ruoka](http://www.thl.fi/fi_FI/web/lastenneuvola-fi/ohjeet/menetelmat/hyvinvointi/ruoka)
    - physical activity: [http://www.thl.fi/fi\\_FI/web/lastenneuvola-fi/ohjeet/menetelmat/hyvinvointi/liikunta](http://www.thl.fi/fi_FI/web/lastenneuvola-fi/ohjeet/menetelmat/hyvinvointi/liikunta)



TABLE 13. Main objectives of dietary guidance in weight management counselling

Objective in eating	How to approach	Justification
Regular and consistent meal schedule	Eating enough at breakfast and lunch	Not eating enough in the morning may cause snacking and unhealthy food choices in the afternoon and evening.
	Eating at the table only	Eating in front of the TV or computer may increase so-called learned hunger.
	No cookies and sweets etc. available at home.	Treats are an invitation to snacking.
	Finding for the child something nice to do and things that bring joy.	Finding other activities instead of eating to relieve boredom or sadness. Food should not be used as a reward, because this increases the attraction of the foods used as rewards
	Children are coached to identify sad feelings and relieve them by e.g. talking to the parents.	
	Food is not used as a reward.	
Health-promoting food choices	The family eats together	Shared family meals, pleasant mealtime setting and the parents' role model impact guide children towards balanced food habits.
	Pleasant mealtime setting	
	Parents as role models in eating a balanced diet.	
	Tasting new foods repeatedly	Vegetables, berries and fruit have sour and bitter flavours, which need to be tasted several times become they start to taste good.
	Vegetables, fruit and berries readily available	

Objective in eating	How to approach	Justification
Reducing energy intake from meals, age-based portion sizes	Children help themselves to food.	The acknowledgement of hunger and satiety is supported and respected.
	The child is not encouraged to eat more.	
	The child is verbally coached to identify hunger, satiety and over-eating.	
	The child eats slowly.	It takes time for satiety to set in.
	Food has a moderate content of fat and sugar.	Reducing the energy density of food may reduce energy intake. Adequate intake of fibre may facilitate weight management.
	Vegetables are served before or during the meal, or fresh fruit and berries are served for dessert.	
	Any bread, porridge or cereal side dish served at mealtime is whole grain.	

### 6.3 Nutrition in early childhood education and care and at school



#### MAIN POINTS

- ▶ Regulations regarding nutrition provided in day care, at schools and in further education are laid down in the Act on Early Childhood Education and Care, Basic Education Act, General Upper Secondary Schools Act and Vocational Education and Training Act, as well as in the national core curricula for pre-primary education, basic education and general upper secondary education, and for morning and afternoon activities.
- ▶ Mealtimes are part of the early childhood education of children and appropriately organised and supervised meals shall be provided to the children (Early Childhood Education and Care Act, Section 2b).
- ▶ In day care, the objective is to provide food that is healthy and nutritious in compliance with general requirements, and food is available in adequate quantities and adequately often depending on the length of daily attendance (Early Childhood Education and Care Act, Section 2b§).
- ▶ A pupil attending basic education shall be provided with a balanced and appropriately organised and supervised meal on every school day, free of charge (Basic Education Act, Section 31). The national core curricula further stipulate that the school meal programme shall be described also in the local curriculum.
- ▶ Adults within the child's close social circle at home, in day care and at school act as child-raising partners and role models in nutrition education.

### *Production of food services and quality of nutrition*

Food services for day care facilities and schools can be produced as the municipality's own service or outsourced from external food service providers. In competitive bidding processes for food services and in purchasing for food it is important to consider the quality criteria, the most significant of which is the nutritional quality of the food. Food services are produced based on both this Guide designed for families with children, and separate guidelines for food in day care and schools. For the purposes of food services, meal-specific nutritional criteria will be developed as part of recommendations for mass catering for specific age groups. Children and young people in early childhood education and care, basic education and other educational institutes as well as the adults working in such institutes can all eat food prepared according to the same principles in terms of quality.

No salt-containing foods are served to children under 1 year of age and no salt is used in their food. The guidelines issued for the safe use of foods (Annex Table 1) are also to be observed. In the early childhood education and care system, a group may include children both under and over 2 years of age, and therefore the objective for toddler groups is to minimise salt intake. In practice this means that instead of bread, the snacks served to the smallest children consist of porridge or some other food with a soft texture. An option eaten with a spoon reduces salt intake compared with bread and deli meats. The porridge option is necessary for the small children also in order to ensure an adequate energy intake. The children's tastes and the objectives related to learning to eat in different age groups are taken into consideration in the planning of menus. A small amount of added sugar is justifiable in some cases, with e.g. porridges that contain lingonberry or currants, or in berries added to plain fermented milk products.

### *Organising of meals in day care and schools*

The planning of meals and snacks is based on the needs of the children so as to ensure regular meal intervals. In day care, children are served the meals and snacks normally served at that time of the day. For example, breakfast, lunch and a snack for children attending during day hours. Children attending according to a shift work schedule are provided also with dinner and supper. In full-time day care, the meals cover about two thirds, and in part-time day care about one third of the child's daily energy expenditure.

In addition to lunch, schools can provide also breakfast and a snack, for a charge or free of charge. If morning and afternoon activities as referred to in the Basic Education Act are organised in the municipality, children participating in the activities shall be provided with a balanced and varied snack that complies with nutrition recommendations. A snack of good quality consists of vegetables, fruit or berries, as well as cereal products and fat-free or low-fat dairy products.

The meals and snacks offered to the child according to a regular schedule in day care, school, extracurricular activities and at home support each other and together comprise a healthy and well-balanced whole. The menu is on display in day care and schools, and published in the local newspaper or the website of the municipality, for example. This makes it easier for the parents to adapt meals at home to the meals served in day care and schools, and to consider the guidelines issued regarding the frequency of use of certain foods (e.g. sausages).

### *Communal food education*

Every mealtime is an educational situation where children acquaint themselves with new foods, tastes and textures, basic eating skills as well as social interaction and food talk. The entire educational community should have commonly determined objectives and implementation policies for food education. Partnership between homes and the educational and food service staffs is important in the food education of the children and in the execution of their daily meals. The right to self-determination of also the smallest children is respected as concerns eating, and enough time and resources are allocated to mealtimes. Eating is of high social significance and one of the most important forms of education in manners.

Pursuant to the Act on Early Childhood Education and Care, appropriately organised and supervised meals shall be provided to the children. The basis is a child-oriented menu. Children eat as much as they need, and food is not “forced” on them. Bread as well as milk or buttermilk to drink are part of the meal and not used as a reward for eating the rest of the meal. The plate model composed specifically according to the age of each group of children serves as a tool for meal planning. Furniture that is suitable for children, a correctly sized serving line and a general comfortable atmosphere in the facilities are factors that affect the smooth organising and the pleasantness of mealtimes. At best, mealtime is a relaxing break that gives children the opportunity to enjoy their meal in peace, get accustomed to new tastes and gain new taste experiences together with other children as well as adults. All the adults working in day care and schools serve as examples to the children.

In day care, food-related educational events can be organised, such as baking and cooking sessions or harvest events. Small-scale cultivation can be carried out in the courtyard of the day care centre, or

herbs can be grown on the window sill. Seasonal festivities, holidays and various themes introduce children to both Finnish and international food cultures.





### Organising different diets

Children following a special diet due to medical reasons are provided with suitable and safe food in day care and schools. A medical certificate is needed for a special diet. This ensures that the need for the diet has been appropriately diagnosed and that the variety of different foods is as balanced as possible in the child's diet. A diet plan prepared by a nutritional therapist for the individual child can be utilised in the practical implementation of the diet. The meals provided in day care and schools as well as the meals based on special diets are prepared using raw materials acquired through the purchasing channels of the kitchen. The organising of challenging special diets requires a meeting between the children's parents, the educational staff and representatives of the food services. Cooperation is necessary in providing meals to children with diabetes, for example. Special diets are controlled on an annual basis to avoid unnecessary restrictions.

Vegetarian diets as well as diets based on religious and ethical standards are provided according to a request received from the parents or guardians of the children. It is advisable in day care and schools to execute a vegetarian diet as a lacto-ovo vegetarian diet that includes dairy products and eggs in addition to products of plant origin. With children following a vegan diet, special nutritional expertise is required to ensure that they are provided

with balanced meals in day care (Chapter 8.1 Vegan diet).

The details of how the meals are organised are specified in each municipality. The form included in the national allergy programme can be used as a tool.

**More information is available at:**

[http://www.filha.fi/suomi/toiminta/kotimainen/kansallinen\\_allergiaohjelma\\_2008/materiaalit/](http://www.filha.fi/suomi/toiminta/kotimainen/kansallinen_allergiaohjelma_2008/materiaalit/)





# NUTRITION FOR ADOLESCENTS

## MAIN POINTS

- ▶ Children and adolescents need adults as support and role models for everyday lifestyle.
- ▶ It is important that families agree on parenting practices and habits that promote a healthy lifestyle.
- ▶ A balanced diet and regular mealtimes support normal growth and weight development.
- ▶ It is important to challenge any bad eating habits of adolescents.
- ▶ Adolescents seek their own identity through the food and beverage culture as part of their independence process.
- ▶ For young athletes, the meal schedule and adequate intake of energy and nutrients are of special importance.
- ▶ Young athletes need energy both for natural growth and development and for exercise and recovery from exercise.
- ▶ Daily vitamin D supplementation of 7.5 µg is recommended for all 2–18-year olds throughout the year. It is important during the rapid bone growth periods, in particular.

## 7.1 Adolescents need adult support during their independence process

In Finnish families, the responsibility for mealtimes is transferred to the children themselves at an early stage, already during the first school years. Adults may easily over-estimate the children's ability to independently organise their eating and maintain an adequately balanced diet. Although peer influence on food choices increases at school age, children and adolescents need an adult who is in charge of their eating and responsible for the variety and regularity of their eating. It is easier for a child coming home from school to make sensible food choices, if snacks that are ready to eat and food that is easy to heat as well as fruit are readily available to them. It is important that families agree on parenting practices and limits that support the child in making healthy choices in e.g. the use of sweets and consumption of energy drinks and alcoholic drinks.

Adolescents seek their own identity through the food and beverage culture as part of their independence process. This emancipation also involves experiments with food outside the family. Peer influence is strong and peer acceptance is important. The choices made at this point are not the best ones in terms of health, which can cause concern in the adults. It should be borne in mind that even on the upper grades of basic education the parents must still ensure that a variety of healthy food is available to the child.

Experiments with food, both skipping the school lunch and choosing a different diet from the rest of the family are usually temporary and part of the normal independence process. On the other hand, it is important to identify the adolescents who react to difficulties by eating, and to have a low thresh-

old to intervene in cases of non-eating or dietary changes which may be indications of the development of an eating disorder.

It is important that any bad eating habits of adolescents are noticed, because they may cause problems throughout the life and susceptibility to diseases; undernourishment during a growth spurt, for example, affects bone strength and the risk of osteoporosis at a later age. The diet shall contain enough soft fat to ensure hormonal development. A vegetarian diet that is low in protein and fibres, as well as high-intensity exercise may induce hormonal imbalance, if the intake of energy is not adequate or the intake of nutrients is not balanced. Trying to frighten the children with disease risks or presenting the health effects of food do not usually work with adolescents, however.



Even with children who temporarily rebel against the food culture of their parents, the example set by the adults will still act as a model for good or bad eating.

The health of the children as well as their food education are issues addressed in school health inspections, at school meals and in various school subjects. Cooperation between parents and the school is a means to support the learning of good eating habits, prevent the development of nutritional problems, and if necessary, assist in any dietary treatment required by an illness. In school health care, special attention is paid to children and adolescents who follow a special diet or are either overweight or underweight, or obsessed about their weight, as well as to those who eat irregularly and follow an unbalanced diet. When nutritional education is planned at school, it is important to take the entire school community into account, as well as all the observations made in the school and any other topical matters. Actions for the promotion of healthy nutrition are planned and implemented on the basis of this information, both during lessons and in the whole school environment (e.g. selection of snacks available to the children, functioning water dispensers, candy-free school campaigns, snack clubs, exercise opportunities and banning of beverage and sweet vending machines).

## 7.2 Nutrition for children and adolescents engaged in sports

For all school-age children, the daily recommendation is 1–2 hours of versatile exercise (incidental exercise, outdoor activities, playground activities, physical education at school, journey to and from school) in a manner suited to the age. Children and adolescents engaged in sports refer here to school-age children, who in addition to

the recommended amount of exercise participate in supervised sports several times a week.

The nutrition recommendations presented in Chapter 2 can be applied also to growing athletes and high-active adolescents as the basis for the diet. In target-oriented sports, with practices several times a week, it is particularly important to follow the plate model at the main meals and adapt a correct number of snacks to the amount of exercise. High energy expenditure and frequent practices require carefully considered meal schedules. On the other hand, some sports involve weight restrictions or expectations related to the physical appearance. In those cases it is of particular importance to ensure the good quality of the young athlete's diet.

### *Enough energy for growth and sports*

Adequate energy intake is the most significant factor affecting the performance of an athlete. A growing athlete needs energy both for natural growth and development, and for the physical exercise and recovery from it. The expenditure of energy and nutrients is influenced by the total amount of exercise, the size, age and gender of the child, the type of sport and the different competition and training seasons. The energy expenditure of a petite girl gymnast differs considerably from the energy expenditure of a big boy swimmer of similar age. Energy intake is usually adequate, if the child or adolescent enjoys training also at high intensity, recovers well from training and has a high state of alertness. Normal development of weight and height and for girls the start of periods according to the development stage are also important indications of adequate energy intake and good nutrition. In aesthetic sports of low energy expenditure and in sports based on weight classes it is of special importance to ensure that the intake of nutrients from food is adequate in proportion to the low energy intake.

### *Meal schedule*

The everyday meal schedule of a young athlete includes, at the very least, breakfast, school lunch, snack, dinner and supper. Sufficiently short intervals between meals ensure that blood sugar levels stay within a narrow range and training or recovery is not hampered by fatigue, hunger or thirst. Correct timing of eating is important for growing athletes and mealtimes should be adapted to the daily practice schedules.

In competitive sports, the weekly training schedule is supplemented with morning practices, which for many young athletes double the amount of training. In some sports, morning practices start already on the upper grades of basic education, but in most cases they are introduced at the latest when the students are on upper secondary education level. Most athletes do not like to eat a heavy breakfast before training, and they should prepare for morning practices with a heavier supper already the night before. The breakfast can then be quite light, but a snack is necessary after the morning practice. By planning ahead, packed snacks can be used to ensure that the snacks are healthy.

Eating and snacks, including beverages, on competition days and during tournaments should be planned the day before. Good packed snacks for competition days include foods that are easy to digest to avoid stomach discomfort in addition to competition anxiety.



### *Plate model for active adolescents*

The so-called athlete's plate model is better suited to an active young athlete than the basic plate model. The athlete's plate is composed according to the principle that one third is food containing protein, another third is food containing carbohydrates and the last third consists of vegetables. This plate model has been adapted to the athletes' slightly higher need for energy and nutrients. In addition to the main meals, breakfast, larger snacks and supper should also be based on the athlete's plate model, with vegetables, fruit and berries accounting for one third of also these meals. In sports with high energy expenditure, portion sizes are larger, but following the plate model ensures that the meals are well-balanced.



Adequate protein intake is ensured when main meals are based on the plate model and snacks consist of dairy products, such as low-sugar yogurt, cottage cheese, quark, fat-free milk or buttermilk, and using vegetables as well as cheese, whole cut deli meats or egg for sandwich filling.



### *Nutrients from a balanced diet*


The body uses protein for both muscle growth and recovery after exercise. Children and/or adolescents who engage in sports need an adequate intake of protein both for their normal growth and because of the large amount of exercise. However, excessive protein intake is not beneficial. If a proper meal is not possible after a sports performance, it is advisable to have a small snack or a beverage that contains protein and carbohydrates, such as a glass of fat-free milk, to support the recovery process.

The higher the amount of muscle work, the more carbohydrates are needed as a source of energy. As a rule, athletes should choose whole grain products. They provide vitamins and minerals that are important to athletes, such as magnesium and iron. Athletes who follow a high-intensity training schedule and thus have a high energy expenditure (e.g. swimmers, hockey players and endurance runners) can include also fast absorbing carbohydrates, such as white bread, rice and juice, in their diets, if it is not otherwise possible to ensure an adequate daily intake of energy from the meals. Inadequate intake of carbo-




hydrates prevents efficient training and depletes the energy stores of the muscles.

Sports-oriented adolescents may have a higher need for vitamins and minerals than other youths, but not many times higher. The need of these can also be satisfied by eating a balanced diet and sufficient amounts. Also athletes often tend to eat unbalanced meals or insufficient amounts in everyday life, and they need to be encouraged to follow a balanced diet.



Adequate intake of nutrients is best ensured by following a balanced diet.



The meal schedule of a young athlete must be based on short intervals between meals and carefully selected snacks.

### *Beverages*

Water is all that is needed as the primary beverage for both exercise enthusiasts and athletes. In hot weather and during long sports performances and tournaments, a sports drink can be used as a source of rapid hydration as well as required salts and carbohydrates for the body. However, sports drinks should not be part of the daily diet for thirst quenching. It is important that the difference between energy drinks and sports drinks is made clear to teenagers. Energy drinks have no place in sports, because they are high in caffeine which increases fluid losses. Acidified beverages can also cause discomfort during exercise. If a young person needs energy drinks to combat fatigue, the amount of sleep and rest they get as well as the quality and quantity of their food should be checked.

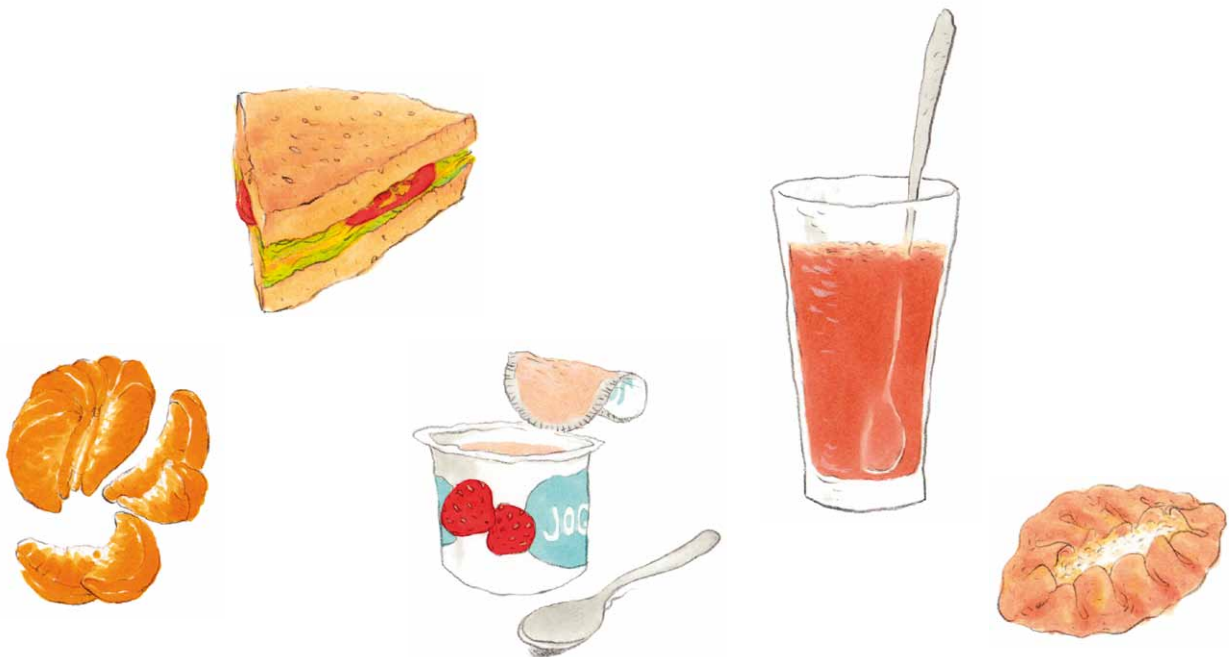






## TIPS TO YOUNG ATHLETES

- Remember the meal schedule. Eat at regular intervals of about 3–4 hours.
- Every day, drink 1–3 glasses of fat-free milk, buttermilk or water at meals. During practice, drink “a few mouthfuls” of water (1–2 dl) every 15–20 minutes.
- Energy drinks are not sports drinks.
- Eat a good breakfast in the morning when preparing for a competition or tournament; it will keep you going for a long time.
- If possible, eat a proper meal about 2–3 hours before your performance, because it is not nice to exercise with a full stomach.
- Easily digested snacks, such as yogurt, bread rolls, Karelian pasties, fruit and juice provide a convenient snack to take with you to sports events.
- Choose fruit on the day of competition and avoid heavy foods.





# VEGAN DIET, SPECIAL DIETS AND SPECIAL CIRCUMSTANCES

In this Chapter we first discuss the vegan diet for pregnant and breastfeeding women and for children. Other vegetarian diets, including a semi-vegetarian diet that may include also fish and possibly white meat, as well as lacto-ovo and lacto vegetarian diets are executed in compliance with the basic principles of a health-promoting diet (cf. Chapter 2.2). The Chapter then goes on to discuss children's special diets, food allergies, lactose intolerance, celiac disease and dietary treatment of abnormal blood fat levels. Digestive problems in children and the diet during an illness are also addressed.

The dietary treatment of each disease (celiac disease, food allergy and abnormal blood fat levels) follows the current care guidelines for the disease concerned.

**More information is available at:**  
[www.kaypahoito.fi](http://www.kaypahoito.fi)

## 8.1 Vegan diet

### MAIN POINTS

- ▶ A properly planned vegan diet is balanced and consists of cereal products, vegetables and root vegetables, legumes, nuts and seeds as well as fruit, berries and plant fats, and a nutritional beverage to replace milk.
- ▶ A carefully composed vegan diet is suitable also for pregnant and breastfeeding women, children and adolescents.
- ▶ Vegans need 5–6 balanced meals a days to secure their intake of energy, protein and other nutrients.
- ▶ Children are given vitamin D supplementation according to recommendations since the age of two weeks with a dosage of 10 µg/day; for 2–18-year old children the dosage is 7.5 µg/day.
- ▶ Adult vegans ensure their intake of vitamin D by using a supplement preparation as needed, particularly during pregnancy and breastfeeding.
- ▶ Vegan diet is further supplemented with food supplements containing vitamin B<sub>12</sub> and iodine.
- ▶ Vegan families shall be provided with guidance by a nutritional therapist, because following a vegan diet requires special expertise as well as availability and balanced use of foods suited for the vegan diet.



Organic grains contain less selenium than regular grains. In vegan diet, nuts and seeds are a good source of selenium.



Verify the amount of calcium in the plant-based beverage used.

### *Variety of vegetables*

A vegan diet is based on using exclusively products of plant origin. In order to ensure adequate intake of protein, good sources of vegetable protein are served at several of the meals. Nutritionally balanced sources of protein include whole grain cereal products, legumes i.e. beans, peas and lentils, soy in its different forms (soy flour, meal, slices, tofu, tempeh etc.) as well as nuts, almonds and seeds.

The main meals of a vegan are planned according to an applied plate model, where one third of the plate is covered with protein-containing products of plant origin, another third with some other vegetables, some of them cooked and not all uncooked, and the last third with carbohydrates: potatoes, pasta, or a cereal side dish such as oats or barley. A meal based on the plate model also includes whole grain bread, a fat spread and a beverage. Balanced snacks are important as well. The energy content of meals and snacks must be sufficient. Whole grains are in a vegan diet an important source of minerals, vitamins and fibre, but as fibre also enhances satiety, it is important to use also white cereal products and fat in adequate quantities to ensure sufficient intake of energy. Restricted vegetarian diets, such as a macrobiotic diet or raw food diet are not adequate in nutritional terms.

### *Adequate intake of essential fatty acids*

In order to ensure adequate intake of essential fatty acids (linoleic and alpha-linolenic acid), it is necessary that rapeseed oil and a rapeseed oil based spread (at least 60% fat content) are used daily. Nuts and seeds in e.g. paste form also provide essential fatty acids in a child's diet. A vegetarian diet is low in eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), but the body is capable of producing them from the alpha-linolenic acid of rapeseed oil. Rapeseed oil is the recommended choice for cooking and there are margarines suitable for vegans available in the market.

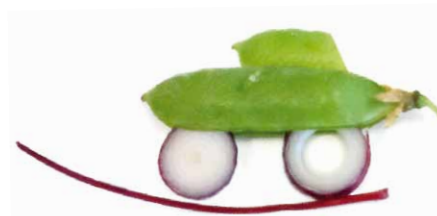
### *Enriched plant protein drinks*

Milk-like enriched plant drinks are drunk at meals and used in cooking. Vegetable drinks based on oats, soy, nuts, almond, millet and quinoa are used like regular milk with meals and snacks. The most recommendable of these are drinks fortified with a variety of nutrients (calcium, vitamin B<sub>2</sub> (riboflavin), vitamins B<sub>12</sub> and D) and with no added sugar. Rice drinks are not recommended as the sole primary beverage at meals for children under 6 years of age. Suitable snacks include yogurt-like soy and oat products, and cream-like soy and oat products are a suitable choice for cooking. Rapeseed oil and high-fat milk-free vegetable margarine with vitamin D in the form of D<sub>2</sub> are recommended for cooking.

### *Vegan diet for infants*

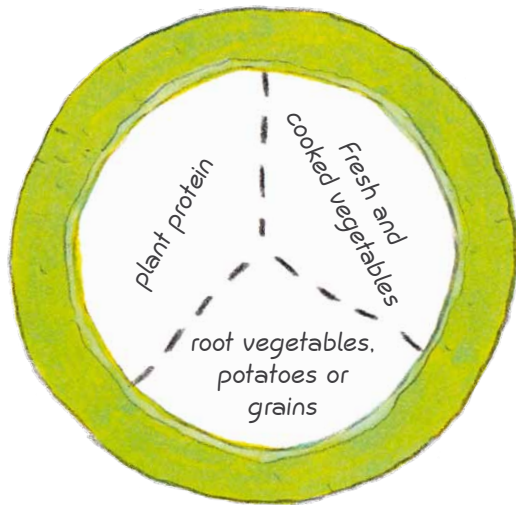
Exclusive breastfeeding is recommended for vegan infants up to 4–6 months of age, and partial breastfeeding along with solid foods should be continued until the age of 1 year. There is no infant formula designed for normal use in the Finnish market that would be suitable in a vegan diet, and therefore a vegan diet is a nutritional risk for infants who are not breastfed under the age of 1 year. After the age of 1 year, children should as the primary beverage be given a cereal drink made from soy, oats, quinoa or some other grains, fortified with calcium and vitamin D and specifically designed for small children. Rice drinks shall not be used. The child is started on solid foods according to the principles of nutrition recommendations for infants. It is important to use an adequate quantity of cooked vegetable and cereal foods in

the vegan diet of a child, instead of favouring e.g. raw porridges, because of the poor digestion of raw vegetables. When properly cooked, legumes can well be given already at the age of seven months. Toddlers' diet can include also various processed foods that contain protein and are suitable for vegetarians, such as falafels (made from chickpeas), vegetable burgers and vegetable balls, as well as vegetable sausages, but they often have a high salt content, which needs to be taken into account.



#### **i** Food supplements for vegans

- A vegan diet shall always be complemented with food supplements that contain vitamin B<sub>12</sub> and iodine.
- Vitamin D supplementation is recommended at a dosage of 10 µg/day from the age of 2 weeks until 2 years, 7.5 µg/day for children 2–18 years of age, and 10 µg/day for adults. A preparation containing vitamin D<sub>3</sub> is recommended, but a plant-based vitamin D<sub>2</sub> preparation can also be used, if the parents so wish.
- The need for other food supplements, such as calcium, vitamin B<sub>2</sub>, iron and zinc is assessed specifically in each individual case.
- Vegans normally do not have problems with adequate intake of iron and zinc, as e.g. legumes and whole grains are rich in them. The high intake of vitamin C in a vegan diet helps the absorption of iron.
- Seaweed products are not to be used for infants. Nor shall they be used for children under 6 years of age or pregnant and lactating women, if the iodine content of the product is not known or if the content is excessively high (Annex Table 1). High levels of heavy metals (arsenic, cadmium and lead) have also been found in some seaweeds.



**FIGURE 10.** A balanced vegan meal consists of three food groups; a side dish of root vegetables, potatoes or grains, uncooked and cooked vegetables, as well as sources of plant protein. Foods made from berries, fruit, nuts and almonds supplement main means and serve as snacks.

### *Nutritional guidance for vegan families*

Vegan families shall be provided with guidance by a nutritional therapist, because following a vegan diet requires special expertise as well as availability and balanced use of foods suited for the vegan diet. The growth of vegan children is monitored at the child health clinic and children are referred to a nutritional therapist, when they are transferred onto the family's diet, or earlier, if necessary. When the child starts in day care, the parents are advised to check the policies of the municipality regarding the serving of vegan and vegetarian food: the degree of specific tailoring of meals available in day care. Discussions with the provider of the food services on the execution of the diet are also recommended.

## 8.2 Food allergy

Suspicions of food allergies are common, but only 3–9 percent of children have a diagnosed food allergy. (Current Care Guidelines for children's allergies, 2014).

The most common food allergies in infants include milk allergy (2–3%) and egg allergy (1–2%). In most cases, allergies to milk, egg and grains disappear before school age. Allergies to nuts and fish, on the other hand, usually persist into adulthood. Food allergies to fruit and vegetables are usually mild in small children and disappear quite quickly (by the age of 6–12 months). Fruit and vegetable allergies connected with pollen sensitisation become more common after the age of two years.

An as varied and balanced diet as possible, adapted to the child's age, as well as adequate intake of energy and nutrients to safeguard growth and development are important aspects in the treatment of a food allergy. The diet is actively expanded in compliance with medical advice and a variety of foods from different food groups are introduced into the diet. If necessary, the diet of an allergic child shall be supplemented according to medical advice in order to ensure adequate intake of energy and nutrients.

Elimination diets shall be based on a medical diagnosis. Only the foods that cause symptoms are eliminated from the diet. The degree of elimination depends on the severity of symptoms. With severe symptoms, a strict elimination of the foods that cause them is needed. Foods that cause only mild symptoms, on the other hand, can be used within the limits permitted by the symptoms, as according to current understanding this will enhance the development of tolerance. Mild allergic symptoms that disappear by themselves, such as itching of mouth and skin flushes, are typically caused by uncooked

vegetables (tomato, carrot, apples) and fruit, particularly with children suffering from birch pollen allergy and atopic dermatitis. Vegetables that cause mild symptoms are usually well tolerated when cooked. Allergies to additives and spices are extremely rare.

Severe and multiple food allergies are always treated by a unit specialising in food allergies, where the expansion of the diet and the child's growth are monitored on a regular basis.

**More information is available at:** Food allergy (children), Current Care Guidelines 2015

## 8.3 Lactose intolerance

People with lactose intolerance have a reduced production of the enzyme that breaks down lactose. This condition is referred to as hypolactasia. Lactase deficiency in the small intestine causes the unabsorbed lactose to draw fluid into the intestine. Bacteria in the large intestine break down lactose, producing intestinal gas. Symptoms of lactose intolerance include abdominal bloating, and partly as a result of that, stomach pains, flatulence and diarrhoea. Symptoms usually appear 1–2 hours after a meal that has contained an abundance of lactose. Small quantities of lactose, 2–3 grams, do not usually cause symptoms.

At birth, we all have enough of the lactase enzyme to break down the lactose contained in breast milk. However, the production of lactase decreases with age, which for some people later results in lactose intolerance. The decrease in lactase production does not usually manifest itself until after the age of 5 years. In extremely rare cases a baby is born with no lactase enzyme at all.

A diagnosis of lactose intolerance must be in place before the use of milk products is restricted in the child's diet. The possibility of milk allergy and celiac disease need to be ruled out at the anamnesis and basic examination stage. When lactose is reduced or eliminated from the diet, the symptoms usually disappear in a couple of weeks.

In addition to milk products, symptoms due to lactose can also be caused by products made using milk, such as certain baked products and bread, or milk chocolate. There are products available in the market from which lactose has been removed or which only contain a small amount of lactose. Mature, or hard cheese does not contain any lactose, and the lactose levels of fermented milk products are lower than those of unfermented products. In cooking and baking, milk and milk products can be replaced with low-lactose or lactose-free products, water, juice, bouillon preparations or grain-based drinks.

In order to ensure adequate intake of calcium, it is recommended that children's diet includes low-lactose or lactose-free milk drinks, yogurt or other fermented milk products (e.g. buttermilk, "viili"), hard cheese or grain-based drinks supplemented with calcium. Adequate intake of calcium and vitamin D is to be secured according to general guidelines.

## 8.4 Celiac disease

Celiac is a lifelong disease where the patient cannot tolerate gluten, the protein contained in wheat, barley and rye. The only treatment for Celiac disease is a lifelong gluten-free diet. The skin form of celiac is the only form of the disease that may also require medical therapy at the beginning. It is important that both the celiac sufferer and people in their close circle are provided with and obtain information about celiac and the dietary treatment of the disease. It is of advantage to learn to accept celiac as a lifelong disease so as to be able to adopt a diet that requires lifelong care and to justify it to oneself and others. Celiac sufferers can stay healthy and maintain their working and functioning ability by following an absolutely gluten-free diet.

A gluten-free diet consists of foods that do not contain any gluten, as well as gluten-free oats, which refers to oats that are not contaminated at any phase of the production process by gluten-containing grains (previously referred to as pure oats). Other suitable grains include e.g. rice, millet, corn, buckwheat, quinoa and teff. The primary objective of dietary guidance is to repair the damage to the lining of the small intestine and to prevent the appearance of immediate symptoms, which have adverse effects on well-being and health (abdominal symptoms, eczema, poor nutritional status, weight loss, iron deficiency anaemia, infertility, embrittlement of bones). A lifelong gluten-free diet prevents other conditions related to untreated celiac disease (e.g. osteoporosis, infertility, malignant tumours).

**More information is available at:** Celiac disease, Current Care Guidelines 2010

## 8.5 Abnormal blood fat levels

### MAIN POINTS

- ▶ The same principles are applied to the treatment of abnormal blood fat levels with both children and adults.
- ▶ With children, dietary treatment can be safely started at the age of 1–2 years.
- ▶ The foods for the diet are selected from foods that are recommended for the whole family.
- ▶ In mild cases the child is treated in primary health care, more severe cases are referred to specialised medical care.

Blood cholesterol levels should be determined in children with familial susceptibility to cardiovascular disease at an early age (men under 55 years, women under 65 years) or to hypercholesterolaemia requiring treatment. The foods for their diet are selected from foods that are recommended for the whole family (Chapter 2.3). The Finnish Heart Symbol indicates the recommended products in each product group. Attention shall be paid in the diet to the quality of fat and to the amount of fibre and cholesterol. Food quantities also warrant attention. If necessary, products supplemented with plant stanols or plant sterols can be used under medical supervision.



### *Responsibility for a child's dietary treatment and referral to medical care*

In mild cases the child is treated in primary health care. Children are referred to specialised medical care, if the total serum cholesterol exceeds 7 mmol/l, or 6 mmol/l after a 6-month dietary treatment period, or the child is suspected of having the FH disease (familial hypercholesterolaemia). A nutritional therapist or a public health nurse, nurse or doctor with in-depth training in the dietary treatment of dyslipidemia shall be in charge of dietary guidance.

**More information is available at:** Dyslipidemia, Current Care Guidelines 2013

#### TO SUPPORT GUIDANCE

- Dyslipidemia, Current Care Guidelines 2013



#### TIPS TO FAMILIES

- Soft vegetable margarine to be used as bread spread, vegetable oil or an oil dressing as salad dressing.
- Vegetable oil or a fluid vegetable oil based margarine or a soft high-fat (at least 60%) vegetable margarine are suitable for cooking and baking. Butter and butter-based bread spreads are not recommended.
- Fish should be eaten at least 2–3 times a week.
- Liquid milk products with a fat content of at most 1.0% should be selected, as well as the lower-fat alternatives of cheeses (fat content at most 17%).
- Chicken and turkey are to be favoured, and the low-fat alternatives of other meats, such as ground meat with a fat content of no more than most 10%.
- The preferred deli meats are the products that contain no more than 4% fat.
- Vegetables, berries and fruit should be served at every meal. The aim should be five child's own palm-sized portions a day.
- Whole grain products should be chosen from the cereal group (fibre content at least 6%).
- No more than two eggs should be eaten per week due to the high cholesterol content of the yolk.

## 8.6 Digestive problems in children and diet during illness

### *Constipation*

Exclusively breastfed children rarely suffer from constipation. There can be an interval of up to one week between their bowel movements, but as long as the stools are soft, they are not constipated.

The stools of a child on infant formula are usually more solid than the stools of breastfed infants. The interval between bowel movements and the consistency of the stools will change when an infant is transferred from breast milk onto infant formula and further onto solid foods. The colour of the stools will change from mustard yellow to brown when the infant starts solid foods, and the frequency of stools can be reduced. Provided bowel movements do not appear to cause discomfort to the child, they do not suffer from constipation.



Pureed vegetables can be given from the age of four months to make the stools softer. Pureed vegetables, grated carrots, tomato flesh, grated fruit and mashed berries are a better choice than kissels and purees low in fibre. Pureed plums and plum juice soften the stools, but they should not be used on a daily basis. After the age of five months, whole grain porridges are a good source of fibre. They can also be supplemented with bran. Water is used as the primary beverage, in addition to breast milk or infant formula.



## *Diarrhoea*

Diarrhoea is quite a common disease in small children, usually caused by a viral or bacterial infection. Severe diarrhoea, vomiting, high temperature and reduced intake of normal nutrition can result in a life-threatening state of dehydration.

Children's diarrhoea can normally be treated at home, ensuring efficient hydration, or in outpatient care under supervision of a doctor or a public health nurse. Medical attention is needed for a child with diarrhoea, when

- the child is under 6 months of age
- an infant has a high fever in addition to diarrhoea
- rectal temperature exceeds 39°C
- the child is moderately or severely dehydrated
- home care is not enough
- the child has manifested growth failure already before the diarrhoea
- the child suffers from a bloody diarrhoea.

An oral rehydration solution is used to prevent and correct dehydration. The instructions for use provided in the labelling are to be complied with. Home-made salt-sugar-water blends are not used. Products that contain lactic acid bacteria can shorten the duration of diarrhoea. They are available in capsules, drinks and milk preparations. Juices and beverages that contain sugar are not suitable to diarrhoea patients unless diluted, because part of the sugar may not be absorbed, resulting in malabsorption of salt and water and causing an osmotic diarrhoea in addition to the infection diarrhoea. Fruit and berry based drinks should be diluted with a ratio of 1:2.

## *Regurgitation and vomiting*

Regurgitation, or wet burps, is common if the baby eats too quickly, the breast milk supply is overabundant, the mother's breasts are too full or the child swallows a lot of air when sucking. Regurgitation is usually harmless and will disappear, when the child's muscles that close off the oesophagus develop and the stomach volume increases. Both breastfed and bottle-fed infants can have wet burps.

In breastfeeding, regurgitation can be prevented by ensuring that the infant has a deep latch, and with bottle-fed babies by making sure that the baby eats slowly and is in a semi-vertical position, as well as by burping the infant at the end of, or if necessary, during feeding. Increasing the feeding frequency to reduce the quantity of milk in one feeding session can help. Infants should sleep on their side and the head end of the bed can be raised slightly to prevent regurgitation. For some infants, solid purees and kissels as well as making the formula thicker with a thickening agent available from pharmacies can help with wet burps. If regurgitation is frequent, the infant spray-vomits or the infant's weight gain is not adequate, a medical examination is necessary.

## *Fever and infections*

When children run a fever, it is important to ensure their intake of fluids and food. They need to be given fluids frequently, choosing the right drink for their age, as well as any food that they are willing to eat. Infants shall be breastfed frequently. If the child is unable to eat solid food, their energy intake is replaced with sugared drinks and milk products suitable for their age. Sick children often prefer cool drinks, berry soups and kissels, yogurt and ice cream.



## ANNEX TABLES 1–7

## ANNEX TABLE 1. General guidelines for safe use of foods.

This Table lists the foods, which according to current knowledge may involve risks. The Table is maintained by the Finnish Food Safety Authority Evira. The most recent information is available at: <http://www.evira.fi/portal/en/food/information+on+food/food+hazards/restriction+on+the+use+of+foodstuffs/>

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>FISH AND FISH PRODUCTS</b>			
<b>Fish</b>	Whole population	<p>Fish should be eaten 2–3 times a week according to recommendations. The health benefits obtained from fish are greater than the potential adverse effects. Varied use of different species eliminates any concern about levels of environmental contaminants.</p> <p>It is recommended that lake fish, farmed fish and sea fish (e.g. whitefish, vendace, pollock, rainbow trout, Arctic char, trout) are varied in the diet.</p> <p>People who eat fish from inland lakes on a daily basis are recommended to cut back on the consumption of pike as well as other predatory fish that accumulate mercury (big perch, pikeperch and burbot).</p>	<p>Mercury and/or polychlorinated biphenyls (PCB) and dioxins accumulating in some fish, and radioactive substances in some lakes.</p> <p>High mercury levels in pike caught in inland waters or sea, and in predatory fish caught in inland waters.</p>
	Vulnerable groups: Infants 1–6-year old School children Persons in fertile age	<p>Restrictions for use:</p> <ul style="list-style-type: none"> <li>- large, uncleaned herring more than 17 cm in length or alternatively salmon or trout caught in the Baltic; 1–2 times a month.</li> <li>- pike caught in a lake or sea; 1–2 a month.</li> </ul>	<p>Exceptions defined by Evira to general fish eating recommendations: <a href="http://www.evira.fi/portal/en/food/information+on+food/food+hazards/restriction+on+the+use+of+foodstuffs/dietary+advice+on+fish+consumption/">http://www.evira.fi/portal/en/food/information+on+food/food+hazards/restriction+on+the+use+of+foodstuffs/dietary+advice+on+fish+consumption/</a></p>
	Pregnant women Breastfeeding women	<p>Pike to be avoided completely during pregnancy and breastfeeding.</p>	<p>High mercury levels in pike caught in inland waters or sea, and in predatory fish caught in inland waters.</p>
<b>Raw fish, fish in vacuum or modified atmosphere packages, and salt cured fish or cold-smoked at home as well as roe and food containing roe, such as patés and sushi</b>	Pregnant women Infants	<p>Raw fish and salt cured or cold smoked fish, either packed or made at home may only be eaten after heating (internal temperature of the product at least 70°C all over). Sushi and roe and foods containing raw fish to be avoided.</p>	<p>Risk of <i>Listeria monocytogenes</i> bacteria. Food poisoning which during pregnancy carries a risk of miscarriage.</p>

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>MEAT, MEAT PRODUCTS, POULTRY AND GAME</b>			
<b>Sausages, hot dog sausages and deli meats</b>	Infants	Sausages, hot dog sausages and deli meats are not to be used.	Nitrite used as an additive (E 249, E 250). Large amounts of nitrite may have adverse effects on oxygen delivery in the body of a small child. The hard fat and salt contained in sausages have also been taken into account in the recommendation.
	1–2-year old toddlers	At most one meal containing sausage per week, and at most 3–4 slices of deli meats (one slice weighs abt. 10 g) per week	
	Over 2-year old toddlers	The total weekly amount of sausages, hot dog sausages and deli meats may not exceed 150 g, which means e.g.: 1 meal containing sausage per week and 1 slice of deli meats per day or 2 meals containing sausage per week, no deli meats or 2 slices of deli meats per day.	
<b>Liver, liver foods Liver sausage and liver paté</b>	Infants	Liver and liver products are not used.	High level of vitamin A. Excessive intake of vitamin A may for children result in malfunctions of liver and metabolism.  <a href="http://www.evira.fi/portal/en/food/information+on+food/food+hazards/restriction+on+the+use+of+foodstuffs/consumption+of+liver+and+liver-based+foods/">http://www.evira.fi/portal/en/food/information+on+food/food+hazards/restriction+on+the+use+of+foodstuffs/consumption+of+liver+and+liver-based+foods/</a>  Evira's risk assessment report, 2008: <a href="http://www.evira.fi/portal/en/about+evira/publications/?a=view&amp;productId=72">http://www.evira.fi/portal/en/about+evira/publications/?a=view&amp;productId=72</a>
	1–6-year old	Weekly consumption of liver sausage and liver paté may not exceed 70 g (abt. 4–5 slices/week), and at most 300 g of liver casserole (3/4 of a processed casserole pan) may be eaten per month. Liver with gravy and liver steaks should be avoided in that case.	
	Pregnant women	Liver foods (whole and ground liver steaks, liver with gravy, liver casserole) to be avoided during the whole pregnancy.  Consumption of liver sausage and liver paté may not exceed 200 g per week or 100 g at one meal. If liver sausage or paté is used daily, consumption should not exceed 30 g (= 2 Tbsp. = 2 slices) per day.	

<b>Raw meat, raw ground meat and steak tartare.</b>	Whole population	Meat must be appropriately cooked. Pork, all ground meat foods, such as hamburger patties and meat balls as well as meatloaf, are always served cooked through. Same utensils must not be used with uncooked and cooked products.	Infection risk caused by EHEC bacteria with raw beef, lamb and mutton. Salmonella risk particularly with imported meat, and infection risk caused by Yersinia bacteria with pork.
<b>In addition to aforementioned, also raw cut meat (steak), non-perishable sausages (salami, mettwurst) and air-dried ham</b>	Pregnant women	All meat products that have not been heated at any point shall be avoided. Cut meats (steaks, roast) shall also be cooked through.	Risk of toxoplasmosis particularly for pregnant women.
<b>Poultry</b>	Whole population	Only used cooked. Cooking refers to an internal temperature of more than 75°C.	Infection risk caused by Salmonella and campylobacter.
<b>Liver and kidneys of moose older than 1 year</b>	Whole population	Not to be used (not authorised as food).	High levels of heavy metals (cadmium) in the internal organs of moose.

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>MILK AND DAIRY PRODUCTS</b>			
<b>Raw milk and unpasteurised milk</b>	Whole population Note! A food product involving a particular risk to children and pregnant women	To be used as quickly as possible and only after heating.	Risk of <i>Yersinia pseudotuberculosis</i> , <i>listeria</i> , <i>EHEC</i> , <i>Salmonella</i> and <i>campylobacter</i> .
<b>Cheese made from unpasteurised milk and soft cheese made from pasteurised milk</b>	Pregnant women	Not recommended unheated. Listeria bacteria are destroyed when heated to a temperature of more than 70°C, but not by freezing or salting. All cheeses can be used provided they are heated until they bubble.	Risk of <i>Listeria monocytogenes</i> bacteria. Food poisoning which during pregnancy carries a risk of miscarriage.
	Children	Cheese made from unpasteurised milk to be avoided.	Pathogenic bacteria potentially present in raw milk (cf. Item Raw milk).

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>VEGETABLES, MUSHROOMS AND PROCESSED FOODS</b>			
<b>Vegetables that accumulate nitrate</b>	Infants	Vegetables high in nitrate to be avoided: spinach, nettle, beetroot, various lettuces (including rocket), napa cabbage, kale, kohlrabi, pumpkin (all pumpkin types excluding zucchini), radish, celery, fennel, fresh herbs, sprouts, root vegetable juices	High nitrate levels. Large amounts of nitrate may have adverse effects on oxygen delivery in the body of a small child.
<b>Frozen vegetables and processed foods (commercial)</b>	Pregnant women	All frozen vegetables must be heated before use (for salads, brought to boil and cooled before use). Cooled, processed foods designed to be reheated (e.g. casserole) to be heated to boil before consumption.	Risk of infection by Listeria bacteria. Food poisoning which during pregnancy carries a risk of miscarriage.
<b>Foreign frozen berries</b>	Whole population	To be heated before use at 90°C for 5 minutes, or boiled for 2 minutes.	Risk of Noro virus and hepatitis A virus



Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>VEGETABLES, MUSHROOMS AND PROCESSED FOODS</b>			
<b>Early potatoes, new potatoes</b>	Infants	Early potatoes are not recommended to infants who are being introduced to solid foods.	At the early stage of growth, in the early summer, potatoes may contain high levels of solanine and/or nitrate. When the bulbs are fully developed (skin and flesh), these harmful substances have disappeared.
<b>Green, sprouted or damaged potatoes</b>	Whole population	Not to be used	High solanine levels (natural toxin)
<b>Raw tomatoes (undeveloped)</b>	Whole population	Not to be used	High tomatine levels (natural toxin)
<b>Raw beetroot</b>	Whole population	To be properly cooked. Raw beetroot is not to be used.	Risk of food poisoning
<b>Sprouts</b>	Children	To be heated before use	Risk of EHEC and Salmonella bacteria in unheated sprouts
<b>Mushrooms</b>	Whole population	Edibility to be verified, processing according to species.	Natural toxins of some mushrooms
<b>False morel (<i>Gyromitra esculenta</i>)</b>	Pregnant women Breastfeeding women Children	Not to be used	Residues of the toxin gyromitrin despite processing.
<b>Raw grain/seed porridges (prepared by soaking)</b>	Infants 1–6-year old	Not recommended	The hygienic quality of the products may be low.

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>COFFEE AND OTHER CAFFEINE-CONTAINING BEVERAGES AND PRODUCTS</b>			
<b>Coffee and other caffeine-containing beverages</b>	Pregnant women Breastfeeding women Children and adolescents People sensitive to caffeine	The safe daily caffeine intake limit from all sources and in single doses is - 200 mg for pregnant and breastfeeding women - less than 3 mg/kilogram of body weight for children and adolescents (3–18 yr) 200 mg of caffeine is obtained from about 3 dl (= about two cups) of regular brewed coffee or 1.5 dl of espresso. About 1 litre of black tea contains an equal amount of caffeine. The caffeine content of cocoa is 3–5 mg/dl. Beverages that contain caffeine can be consumed on a random basis, but the limits specified for daily consumption and single doses should be taken into account, and for children also the restrictions based on body weight.	Caffeine passes through the placenta to the foetus and through breast milk to the baby. There is not much scientific evidence on the safe intake limits of caffeine for children and adolescents. The safe intake limit has been derived from the values specified for adults.  Even small doses of caffeine may cause palpitations, tremor and insomnia to people sensitive to caffeine as well as to pregnant women and children, if consumed before retiring to bed.
<b>Cola beverages containing caffeine</b>	-"-	Cola beverages are only suited for random consumption. When the caffeine content of a product is more than 150 mg/l, the labelling of the product shall indicate the caffeine content (mg/100 ml) and present the following warning: "High caffeine content. Not recommended for children or pregnant or breastfeeding women." One can (3.3 dl) of a cola beverage contains about 25–60 mg of caffeine and one bottle (5 dl) about 35–90 mg.	
<b>Energy drinks</b>	-"-	Not recommended for pregnant women or children and adolescents under the age of 15 years. When the caffeine content of a product is more than 150 mg/l, the labelling shall present the same warnings as with cola beverages. Evira has further advised that the maximum daily intake of the product is to be indicated in the labelling. A small can (2.5 dl) of energy drink contains about 80 mg and a large can (5 dl) about 160 mg of caffeine.	
<b>Products with added caffeine, e.g. sweets, bubble gum and chocolate bars, as well as food supplements</b>	-"-	The labelling of food products containing caffeine shall present the following warning: "Contains caffeine. Not recommended for children or pregnant women" and an indication of the caffeine content in mg/100 g. The amount of caffeine varies (6–60 mg/serving). For food supplements, the caffeine content of the recommended daily dosage shall be indicated in the labelling. Caffeine is also used as an aroma. Caffeine is in that case indicated in the product's list of ingredients under aromas.	

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>OTHER BEVERAGES</b>			
<b>Herbal teas</b>	Infants  Pregnant women Breastfeeding women 1–6-year old	Not to be used  Not recommended	Safety not known, can contain naturally harmful substances.
<b>Wheatgrass juice, lactic acid fermented juices</b>	Infants 1–6-year old	Not recommended	Hygienic quality of products can be low.
<b>Cocoa (powder and drink)</b>	Infants	Not to be used	Contains tannin which interferes with iron and zinc absorption. (Cf. caffeine under Coffee).
<b>Rice drink</b>	Infants       1–6-year old	Not to be used      Not to be used under 6 years of age as the primary beverage (e.g. at meals).	Nutritional content does not meet children’s needs. High levels of heavy metals (inorganic arsenic).  Evira’s risk assessment report on children’s exposure to heavy metals: <a href="http://www.evira.fi/portal/en/food/current+issues/?bid=4407">http://www.evira.fi/portal/en/food/current+issues/?bid=4407</a>
<b>Foods (fruit and berry based beverages) containing benzoic acid (E 210) and benzoates (E 211, E 212, E 213)</b>	Infants  1–6-year old	Not to be used  Fruit and berry based beverages containing benzoic acid or benzoates as additives are not recommended for daily consumption.  Water to be chosen as primary beverage.	Safe daily intake limit can be exceeded (additive use), if consumption of beverages containing benzoic acid (E210) and benzoates (E 211, E 212, E 213) is high or several products with added benzoic acid or benzoates are used.

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>SWEETS AND HONEY</b>			
<b>Liquorice and salty liquorice sweets</b>	Pregnant women	Not recommended	Liquorice and salty liquorice sweets contain glycyrrhizin for which a safe consumption limit is not known. High glycyrrhizin levels increase blood pressure and cause swelling, and may carry a risk of miscarriage and can be linked with developmental disorders of the child. Small doses (e.g. a serving of liquorice ice cream or a few sweets) are not harmful.
<b>Honey</b>	Infants	Not to be used (Warning in Decree on honey)	May contain spores of <i>Clostridium botulinum</i> bacteria. <i>C.botulinum</i> bacteria can produce dangerous botulinum toxin. Infants run a risk of infant botulism, because the spores can in infants be converted into bacteria capable of growing and producing toxin due to the undeveloped intestinal microflora of the child.

Foodstuff / food product	Applicable to	Correct use	Basis for guidelines
<b>SEEDS, SPICES, HERBS, SEAWEED AND FOOD SUPPLEMENTS</b>			
<b>Oil plant seeds (e.g. flaxseeds and sunflower seeds)</b>	Adults	At most 2 Tbsp. (ca. 15 g) of flaxseeds or other oil plant seeds per day.	Flax as well as some other oil plants have a natural ability to accumulate heavy metals from the soil, particularly cadmium, in their seeds.
	Pregnant women Breastfeeding women	Flaxseeds should not be used as such, ground or soaked during pregnancy and breastfeeding for treatment of constipation. Small amounts of flaxseeds in e.g. bread are not harmful.	
	Infants	Not to be used	
	1-6-year old	At most 1 Tbsp. (ca. 6-8 g) per day using a variety of seeds	
<b>Cinnamon (Chinese cassia)</b>	Infants	Not to be used	High coumarin (natural toxin) levels in Chinese cassia ( <i>Cinnamomum cassia</i> , <i>Cinnamomum aromaticum</i> or <i>Cinnamomum burmannii</i> ). Chinese cassia is a commonly used cinnamon. The more rarely used Ceylon cinnamon ( <i>Cinnamomum zeylanicum</i> ) has considerably lower coumarin levels.
	1-6-year old	1-6-year old children should not consume cinnamon or products containing cinnamon (e.g. cinnamon sugar in porridge) on a daily basis. In terms of safety, higher consumption of cinnamon temporarily during e.g. the Christmas season is not a concern.	
<b>Ginger products and ginger tea, as well as food supplements containing ginger</b>	Pregnant women	Use is not recommended	Contain harmful substances, safe consumption limits are not known.
<b>Seaweed products</b>	Infants	Not to be used	Harmfully high levels of iodine contents have been found in some seaweeds. High levels of heavy metals (arsenic, cadmium and lead) have also been detected in some seaweeds.
	1-6-year old Pregnant women Breastfeeding women	Not to be used, if iodine content is not known or is high.	Excessive iodine intake has adverse effects on thyroid function and foetal growth.
<b>Herbal preparations marketed as food supplements</b>	Infants 1-6-year old Pregnant women Breastfeeding women	Use is not recommended	Safe consumption limits are not known. May contain naturally harmful substances.

**ANNEX TABLE 2. Learning to eat by age periods, main themes of nutritional guidance and extended health examinations at child health clinics.**

Age period	Factors related to age period	Main themes of nutritional guidance	Extended health examination
<b>0–4 mo</b>	Learning of sucking and breastfeeding Creation of interactive relationship Rapid growth and development, including intestinal development	Exclusive breastfeeding Breastfeeding guidance Resolving breastfeeding problems Coping of the family Mother's diet	4 mo: Well-being of the whole family, including eating habits and lifestyle
<b>4–6 mo</b>	Vulnerability of breastfeeding Maturing of fine motor skills Development of eating capabilities Increased nutritional needs	Supporting continued breastfeeding Improved breastfeeding guidance Solid foods in tasting portions Solid foods started on individual basis Observing the child's cues – hunger, satiety, the child's developing skills	
<b>7–9 mo</b>	Increased nutritional needs, e.g. protein, iron, zinc Development of fine motor skills (eating with hands, pincer grasp) Learning of family meal schedule starts Rapid development of the child's mobility skills	Supporting continued partial breastfeeding Child introduced to a variety of foods: meat, fish, whole grains, and increasing assortment of vegetables, berries and fruit Eating with hands; finger foods Getting used to a mug Child involved in mealtimes	
<b>10–12 mo</b>	Child sits at the table with the family: capabilities to eat the same food as the rest of the family Child learns to walk Significance of breastfeeding decreases in terms of dietary intake	The diet becomes more varied; milk is added to the diet Healthy diet for the whole family: fats, salt, sugar, primary beverages, snacks Child's food in day care Weaning from the bottle at about 1 year's age	

Age period	Factors related to age period	Main themes of nutritional guidance	Extended health examination
<b>1.5 yr</b>	Eating without help Appetite varies	Family diet assessed for balance and meal schedule	Well-being of the whole family, including eating habits and lifestyle
<b>2–3 yr</b>	The child can eat all foods The child's prejudices about new foods increase naturally Eating varies from one meal to the next Eating mostly without help	Getting acquainted with new foods together with the child, "taste school" Picky eating is a natural phase related to age Introducing a wide variety of foods	
<b>4 yr</b>	The child's world expands Peer influence in day care and/or toddler groups Child allowed to participate in kitchen chores	Beneficial health effects of the family's meal schedule and snacks and adaptation to everyday schedules (incl. sleep) Primary beverages, sweets and dental health Encouraging incidental exercise and physical activity; journeys to and from toddler groups and day care	Well-being of the whole family, including eating habits and lifestyle
<b>5–6 yr</b>	Preparing for pre-primary school and school Fine motor and motor skills related to eating	Small independent food preparation chores Eating without help Meals at pre-primary school/school/home	

## ANNEX TABLES 3a-c. Periodic health examinations at child health clinics and in school health care.

ANNEX TABLE 3a. Periodic health examinations at child health clinics before 1 year age.

	1-4 wk	4-6 wk	2 mo	3 mo	4 mo (extended health examination)	5 mo	6 mo	8 mo	(10 mo)	12 mo
Examination by a public health nurse	x	x	x	x	x	x	x	x	(x)	x
Examination by a doctor		x			x			x		

Source Ministry of Social Affairs and Health 2010.

ANNEX TABLE 3b. Periodic health examinations at child health clinics after 1 year age.

	18 mo (extended health examination)	2 yr	3 yr	4 yr (extended health examination)	5 yr	6 yr
Examination by a public health nurse	x	x	x	x	x	x
Examination by a doctor	x			x		

Source Ministry of Social Affairs and Health 2010.

ANNEX TABLE 3c. Periodic health examinations in school health care.

	1st class (extended health examination)	2nd class	3rd class	4th class	5th class (extended health examination)	6th class	7th class	8th class (extended health examination)	9th class
Examination by a public health nurse	x	x	x	x	x	x	x	x	x
Examination by a doctor	x				x			x	

Source Ministry of Social Affairs and Health 2010.



**ANNEX TABLES 4a-c. Reference values for estimated average daily energy requirements and intake of children, adolescents and adults.**

ANNEX TABLE 4a. Reference values for estimated average daily energy requirements (per kilogram of body weight) for children 6–12 months on non-exclusive breastfeeding.

Age, months	Average energy requirements kJ (kcal)/kilogram of body weight/day	
	Boys	Girls
6	339 (81)	342 (82)
12	337 (80)	333 (79)

ANNEX TABLE 4b. Reference values for estimated daily energy requirements (MJ (kcal)/day) for children and adolescents (2–17 yr)<sup>1</sup>.

Age, months	Weight, kg	BMR	Estimated energy requirement (MJ/day)
2–5	16.1	3.6 (860)	5.0 (1195)
6–9	25.2	4.4 (1050)	6.9 (1650)
<b>Girls</b>			
10–13	38.3	5.0 (1195)	8.6 (2055)
14–17	53.5	5.7 (1360)	9.8 (2340)
<b>Boys</b>			
10–13	37.5	5.4 (1290)	9.3 (2220)
14–17	57.0	6.8 (1625)	11.8 (2820)

<sup>1</sup> Estimated energy requirements is obtained by multiplying the basal metabolic rate (BMR) with the average level of physical activity in the age group. Coefficients for physical activity (PAL) by age group: 1–3 yr: 1.39; 4–9 yr: 1.57; 10–17 yr: 1.73

ANNEX TABLE 4c. Reference values for energy intake in groups of adults (MJ (kcal)/day) of low-activity and high-activity<sup>1</sup>.

Age, yr	Weight <sup>2</sup>	BMR <sup>3</sup> MJ (kcal)/day	Low-activity MJ (kcal)/day PAL <sup>4</sup> 1.6	High-activity MJ (kcal)/day PAL 1.8
<b>Female</b>				
18–30	64.4	5.8 (1385)	9.4 (2245)	10.5 (2510)
31–60	63.7	5.5 (1345)	8.8 (2100)	9.9 (2365)
<b>Male</b>				
18–30	75.4	7.3 (1745)	11.7 (2800)	13.2 (3155)
31–60	74.4	6.9 (1650)	11.0 (2630)	12.4 (2960)

<sup>1</sup> The figures are only applicable on group level due to the uncertainty factors associated with the assessment of both BMR and PAL.

<sup>2</sup> Weight corresponds to a body mass index of 23 and is based on the mean weight of population in Nordic countries.

<sup>3</sup> BMR = basal metabolic rate

<sup>4</sup> PAL = physical activity level, assessed using Henry's equation (2005).

## ANNEX TABLES 5a–b. Recommended intake of fat, carbohydrates and protein for adults and children.

ANNEX TABLE 5a. Recommended intake of fat, carbohydrates and protein for adults and children over 2 years of age.

Fat
<p><b>Monounsaturated</b> fatty acids* should be 10–20% of energy intake (E%).</p> <p><b>Polyunsaturated</b> fatty acids* should be 5–10 E%, of which n-3 fatty acids should provide at least 1 E%.</p> <p>Essential fatty acids, i.e. linoleic acid and alpha-linolenic acid should contribute at least 3 E%, including at least 0.5 E% as alpha-linolenic acid.</p> <p><b>For pregnant and lactating women</b>, the essential fatty acids should contribute at least 5 E%, including 1 E% from n-3 fatty acids, of which 200 mg/day should be docosahexaenoic acid, DHA (22:6 n-3).</p> <p>Monounsaturated and polyunsaturated fatty acids should constitute at least two thirds of the total fatty acids in the diet.</p> <p><b>The intake of saturated</b> fatty acids* should be limited to less than 10 E%.</p> <p>The intake of trans-fatty acids should be kept as low as possible.</p> <p>The recommended total amount of fats is 25–40 E%.</p>

\* Expressed as triglycerides

## Carbohydrates, added sugar and dietary fibre

**Adults:** The intake of dietary fibre for adults should be at least 25–35 g/day, or approximately 3 g/MJ.

**Children:** For children over 2 years of age, an intake of dietary fibre corresponding to 2–3 g/MJ is appropriate. From school age, the intake should gradually increase to reach the recommended adult level during adolescence.

The intake of added sugar\* should be kept below 10 E%.

The recommended total amount of carbohydrates is 45–60 E%.

\* *Added sugars include sucrose, fructose, glucose, starch hydrolysates (glucose syrup, glucose-fructose syrup) and other isolated sugar preparations used as such or added in during food preparation and manufacturing.*

## Protein

**Adults and children over 2 years of age:** Protein should provide 10–20 E% of the total energy intake (E%).

ANNEX TABLE 5b. Recommended intake of fat, fatty acids, carbohydrates and protein for children of 6–23 months.

As exclusive breastfeeding is the primary recommendation for infants under 6 months of age, no intake recommendation is given for them.

Age	E%
<b>6–11 mo*</b>	
Protein	7–15
Fat	30–45
Carbohydrates	45–60 with added sugar accounting for less than 10 E%.
<b>12–23 mo</b>	
Protein	10–15
Fat	30–40
Carbohydrates	45–60 with added sugar accounting for less than 10 E%.

\* These recommendations do not apply to the composition of infant formulae and follow-on formulae. They are regulated on EU level.

### Fatty acids

N-6 fatty acids should contribute at least 4 E% of the total energy intake (E%) for children 6–11-months and 3 E% for children 12–23-months of age.

N-3 fatty acids should contribute at least 1 E% for children 6–11 months and 0.5 E% for children 12–23-months of age.

The intake of trans-fatty acids should be kept as low as possible. From the age of 12 months, the recommendation on saturated and trans-fatty acids for older children and adults should be used.

## ANNEX TABLES 6a–b. Recommended daily intake of vitamins and minerals.

ANNEX TABLE 6a. Recommended daily intake of vitamins\*.

Age yr	Vitamin A RE <sup>2</sup>	Vitamin D <sup>3</sup> µg	Vitamin E α-TE <sup>4</sup>	Thia- mine (B <sub>1</sub> ) mg	Ribo- flavin (B <sub>2</sub> ) mg	Niacin (B <sub>3</sub> ) NE <sup>5</sup>	Pyridoxi- ne (B <sub>6</sub> ) mg	Folate µg	Vitamin B <sub>12</sub> µg	Vitamin C mg
<b>Children</b>										
< 6 mo <sup>1</sup>	-	-	-	-	-	-	-	-	-	-
6–11 mo	300	10	3	0.4	0.5	5	0.4	50	0.5	20
12–23 mo	300	10	4	0.5	0.6	7	0.5	60	0.6	25
2–5 yr	350	10	5	0.6	0.7	9	0.7	80	0.8	30
6–9 yr	400	10	6	0.9	1.1	12	1.0	130	1.3	40
<b>Boys/men</b>										
10–13	600	10	8	1.1	1.3	15	1.2	200	2.0	50
14–17	900	10	10	1.4	1.7	19	1.6	300	2.0	75
18–30	900	10	10	1.4	1.6	19	1.5	300	2.0	75
<b>Girls/Women</b>										
10–13	600	10	7	1.0	1.2	14	1.1	200	2.0	50
14–17	700	10	8	1.2	1.4	16	1.3	300	2.0	75
18–30	700	10	8	1.1	1.3	15	1.2	400	2.0	75
<b>Pregnant women</b>	800	10 <sup>3</sup>	10	1.5	1.6	17	1.4	500	2.0	85
<b>Lactating women</b>	1100	10 <sup>3</sup>	11	1.6	1.7	20	1.5	500	2.6	100

\* Recommended intake refers to consumed amount, and losses during food preparation, cooking, etc., must be accounted for.

<sup>1</sup> Breast milk or infant formula satisfies the needs of infants under 6 months for energy and nutrients, as a rule, with the exception of vitamin D. If breastfeeding is not possible, a commercial infant formula is fed to the child. If complementary feeding has started at 4–5 months, the recommended intakes for 6–11-month old infants should be used.

<sup>2</sup> Retinol equivalent (RE) = 1 µg of retinol = 12 µg of β-carotene.

<sup>3</sup> In Finland, vitamin D supplementation is recommended for children all year round, with a dose of 10 µg/day from the age of two weeks until 2 years, and 7.5 µg/day for 2–18-year old. The recommended vitamin D supplementation dose for pregnant and lactating women is 10 µg/day all year round.

<sup>4</sup> α-tocopherol equivalent (α-TE) = 1 mg of RRR α-tocopherol.

<sup>5</sup> Niacin equivalent (NE) = 1 mg of niacin = 60 mg of tryptophan.

ANNEX TABLE 6b. Recommended daily intake of minerals.

Age yr	Calcium mg	Phosphorus mg	Potassium g	Magnesium mg	Iron <sup>6</sup> mg	Zinc <sup>7</sup> mg	Copper mg	Iodine µg	Selenium µg
<b>Children</b>									
< 6 mo <sup>1</sup>	–	–	–	–	–	–	–	–	–
6–11 mo	540	420	1.1	80	8	5	0.3	50	15
12–23 mo	600	470	1.4	85	8	5	0.3	70	20
2–5 yr	600	470	1.8	120	8	6	0.4	90	25
6–9 yr	700	540	2.0	200	9	7	0.5	120	30
<b>Boys/Men</b>									
10–13	900	700	3.3	280	11	11	0.7	150	40
14–17	900	700	3.5	350	11	12	0.9	150	60
18–30	800 <sup>8</sup>	600 <sup>8</sup>	3.5	350	9	9	0.9	150	60
<b>Girls/Women</b>									
10–13	900	700	2.9	280	11	8	0.7	150	40
14–17	900	700	3.1	280	15 <sup>9</sup>	9	0.9	150	50
18–30	800 <sup>8</sup>	600 <sup>8</sup>	3.1	280	15 <sup>9</sup>	7	0.9	150	50
<b>Pregnant women</b>	900	700	3.1	280	– <sup>10</sup>	9	1.0	175	60
<b>Lactating women</b>	900	900	3.1	280	15	11	1.3	200	60

<sup>1</sup> Breast milk or infant formula satisfies the needs of infants under 6 months for energy and nutrients, as a rule, with the exception of vitamin D. If breastfeeding is not possible, a commercial infant formula is fed to the child. If complementary feeding has started at 4–5 months, the recommended intakes for 6–11-month old infants should be used.

<sup>6</sup> The composition of the meal influences the utilization of dietary iron.. The availability increases if the diet contains abundant amounts of vitamin C and meat or fish daily. And it is decreased with simultaneous intake of polyphenols or phytic acid.

<sup>7</sup> Protein of animal origin improves the utilization of zinc from food, whereas the phytic acid of grains has an adverse effect on zinc utilization. The recommendations apply to a mixed diet. In a vegan diet, recommended zinc intake is 25–30% higher.

<sup>8</sup> For 18–20-year old, calcium intake recommendation is 900 mg/day and phosphorus intake recommendation 700 mg/day.

<sup>9</sup> Due to the high variation in iron loss due to menstruation, the required iron intake of women is highly individual. For most women in fertile age, 15 mg of iron per day is adequate. Some women need an iron supplement preparation.

<sup>10</sup> Iron stores of about 500 mg are required at the start of pregnancy to ensure maintenance of iron balance during pregnancy. The increase in the required iron intake after the first trimester is difficult to satisfy without iron preparations.

**ANNEX TABLE 7. Estimated upper intake levels (UL) for average daily intake of certain nutrients for adults. Maximum safe daily intake of certain nutrients for adults.**

Nutrient		Upper limit of safe intake/day
Vitamin A <sup>1</sup>	µg	3000 <sup>2</sup>
Vitamin D	µg	100
Vitamin E <sup>3</sup>	α-TE	300
Niacin (B <sub>3</sub> ) <sup>3</sup> nicotinic acid nicotinamide	mg	10 <sup>4</sup>
	mg	900
Pyridoxine (B <sub>6</sub> ) <sup>3</sup>	mg	25
Folic acid <sup>3</sup>	µg	1000
Vitamin C	mg	1000
Potassium <sup>3</sup>	mg	3700
Calcium	mg	2500
Phosphorus	mg	3000
Iron	mg	25 <sup>5</sup>
Zinc	mg	25
Copper	mg	5
Iodine	µg	600
Selenium	µg	300

<sup>1</sup> µg of retinol and/or retinyl palmitate.

<sup>2</sup> Intake of retinol above 3000 µg/day in pregnant women has been associated with an increased risk of foetal malformations.

<sup>3</sup> In the form of supplements and fortification only.

<sup>4</sup> Not applicable for pregnant and lactating women.

<sup>5</sup> Not applicable for treatment of anaemia.

