



# Finnish Nutrition Recommendations

National Nutrition Council,  
Nutrition Recommendation Section

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Summary

The nutrition recommendations issued by the National Nutrition Council have been renewed. The goal of the recommendations is to define the appropriate nutrient intakes for population groups and to evaluate the goals for improving public health. The central goals for improving Finns' diets and maintaining good health are a balanced nutrient intake, balance between energy intake and expenditure, an increased proportion of carbohydrates, a decreased intake of hard fat, decreased sodium intake, and moderate alcohol consumption.

The recommendations can be used for planning mass catering, as basic material for nutrition education and training and as reference values when estimating food consumption and nutrient intake of groups.

The publication includes recommendations for the basic composition of diet and nutrient intake and advice on food choice.

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## Preface

**N**utrition and health is an active research area with new information being continuously produced. The accumulation of research information on population nutrition, health and nutrient needs has created the necessity to reassess the nutrition recommendations. It has been more than 10 years since the National Nutrition Council issued new recommendations. Since then much new research information has been presented on Finnish food consumption, nutrient intake and the relationships between diet and health. International scientific organisations and expert groups such as FAO/WHO, the U.S. Academy of Sciences, the Scientific Committee for Food of the European Commission, Nordic experts and others have conducted comprehensive assessments of nutrient requirements, diet composition and nutrition recommendations. This work has created a timely opportunity to renew the recommendations for Finland, especially since the Nordic Nutrition Recommendations were recently issued in 1996. The goal of the nutrition recommendations is to define the appropriate nutrient intakes for population groups and evaluate the goals for improving public health. The renewed nutrition recommendations issued by the National Nutrition Council are based on the Nordic recommendations. The National Nutrition Council, however, found some details of the Nordic recommendations unsuited to Finnish circumstances. Therefore, the National Nutrition Council has published its own application of the Nordic recommendations. Special guidelines issued by authorities, such as those for meals in schools, day care and institutions, complement these recommendations.

The recommendations form a base for food and nutrition policy. They can be used for planning mass catering, as basic material for nutrition education and training, and as reference values when estimating food consumption and nutrient intake for research purposes, mass catering or other uses relating to groups.

The recommendations are for groups of healthy, fairly active people. They are not applicable to diet assessments for individuals. The recommended nutrient intakes represent the average recommended intakes over a longer time period, such as a month. Some special groups such as vegetarians and people with lactase deficiency, and some with special circumstances such as pregnant and lactating women, have been taken into account in preparing the recommendations. The recommendations are suitable as such for diabetics and people with high blood pressure or elevated serum lipid levels. Other special diets are not included in the recommendations.

The English translation covers the three first chapters of the Finnish recommendations. These include recommendations for the basic composition of diet and advice on food choice. In addition to the food circle, a food pyramid and a plate model are used to illustrate a good diet. The most recent knowledge about food consumption, nutrient intake, health trends and food safety was taken into account when planning the nutrition recommendations. The recommendations for nutrient intake follow the new Nordic recommendations, which are based on recent research information on the role of nutrition in prevention and development of important non-communicable diseases.

The recommendations focus on nutrients that illustrate the quality of the diet as a whole, on nutrients for which there is important new research information, and on nutrients that have been the topic of recent dietary discussions. In addition the Finnish version takes a position on some special issues in nutrition, but these have not been included in the actual recommendations.

The goal has been to present the recommendations as concisely as possible and make them readable without including details relating to the nutrition physiology. In-depth information to this end can be found in the Nordic recommendations and basic textbooks.

The National Nutrition Council appointed a section for the preparation of these recommendations. Docent Kaija Hasunen, ministerial adviser of the Ministry of Health and Social Affairs, was the chair of the section. M.Sc. Marjaana Lahti-Koski, senior researcher at the National Public Health Institute, was the secretary. The members included: M.Sc. Seppo Heiskanen, Director of the Finnish Food and Drink Industries' Federation; M.Sc. Leena Packalén, Head of information at the Central Union of Agricultural Producers and Forest Owners (MTK); Docent Ritva Seppänen, researcher at the Research and Development Centre at the Social Insurance Institution; and M.Sc. Riitta Tainio, Food Specialist at the Finnish Consumers' Association. The section appointed PhD Anna-Liisa Rauma, Assistant Professor at the Savonlinna College of Education at Joensuu University, as a specialist secretary.

Helsinki October 15, 1998

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# Contents

<b>Preface</b>	5
<b>1 Background and aims of the recommendations</b>	8
<b>2 Recommendations for a good Finnish diet</b>	10
2.1 Variety and colour	14
2.2 Appropriately and adequately	15
2.3 Enjoy unhurriedly	15
<b>3 Nutrient recommendations</b>	16
3.1 Recommended intake of nutrients	17
3.1.1 Balancing energy intake and expenditure	17
3.1.2 Recommended intake of energy yielding nutrients for adults and children over three years of age	20
3.1.3 Recommendations on energy yielding nutrients for children	22
3.1.4 Recommended daily intake of vitamins and minerals	23
3.1.5 Recommended energy-standardised intake of vitamins and minerals (nutrient density)	26
3.1.6 Recommendations concerning intake of sodium (salt)	26
3.1.7 Recommendations concerning consumption of alcohol	27
3.2 Values for the evaluation of low and high intakes	28
3.3 Recommendations for dietary supplements	30
<b>Reference</b>	31

# 1

## Background and aims of the recommendations

The National Nutrition Council issued the previous national nutrition recommendations in 1987. Since then several authorities have defined goals for the diets of special groups and to develop mass catering aimed at health promotion and well-functioning food services. These have been consistent with the national nutrition recommendations.

Over the past ten years Finnish food habits have changed in favour of the recommendations. Finns now choose fat-free or low fat dairy products and vegetable margarine or blends. Vegetable consumption has increased and salt consumption has decreased. In contrast to the recommendations, the consumption of bread and potatoes has decreased and alcohol consumption has increased.

Men eat more than women do, and gender differences relating to food choice are also evident. Regional and socio-economic differences in food consumption also exist. These differences are more clearly based on education than occupation. Socio-economic differences in nutrient intake, however, are very small.

The imbalance between energy intake and expenditure is a problem in Finnish nutrition. Although energy intake has decreased, the prevalence of obesity has increased. In 1997 two thirds of working age men and half of women were overweight. Obesity among women is most common in the group with the lowest educational level. Obesity among men becomes more common in the 40 and over age group.

The changes in food consumption have concurrently decreased the intake of hard fat and sodium. In public health, over the last twenty years this trend has become evident in the decrease of age-standardised coronary heart disease mortality among working age Finns. About half of the change can be explained by the decrease of serum cholesterol levels in the population. However, the intakes of hard fat and sodium are still high. A high intake of hard fat increases an individual's serum cholesterol level. In 1997, 18% of men and 15% of women had serum cholesterol levels above 6.5 mmol/l. At these levels the risk for coronary heart disease is clearly elevated.

Overweight, high intakes of sodium and alcohol elevate blood pressure levels. Only about one third of adult Finns have recommended or satisfactory blood pressure levels. Overweight is also a risk factor for musculo-skeletal diseases. More than a million Finns have a chronic musculo-skeletal disease. The prevalence of other non-communicable diseases such as allergies and diabetes are continuously growing, and nutrition plays an important role in their prevention and care.

These recommendations are based on the most recent information on trends in Finnish food habits and nutrient intake. The traditional goal of nutrition recommendations is to prevent nutrient deficiencies and related diseases. Today the intakes of almost all vitamins and minerals are sufficient on average. The goal of Finnish nutrition policy is good public health, thus the recommendations take into account the relationship between diet and the major non-communicable diseases. The nutrition recommendations also reflect the times. In the early 20th century a high-energy intake was necessary. Today a lighter diet is justifiable.

These recommendations stress the importance of the whole diet. In itself, a single food or dietary component does not usually clearly impair or improve dietary quality. The goals have been to balance energy intake and expenditure and emphasise the proportions of the various energy yielding nutrients rather than tracking the intakes of separate nutrients.

The central goals for improving Finns' diets and maintaining good health are:

- balanced nutrient intake
- balance between energy intake and expenditure
- increased proportion of carbohydrates
- decreased intake of hard fat
- decreased sodium intake
- moderate alcohol consumption

## 2 Recommendations for a good Finnish diet

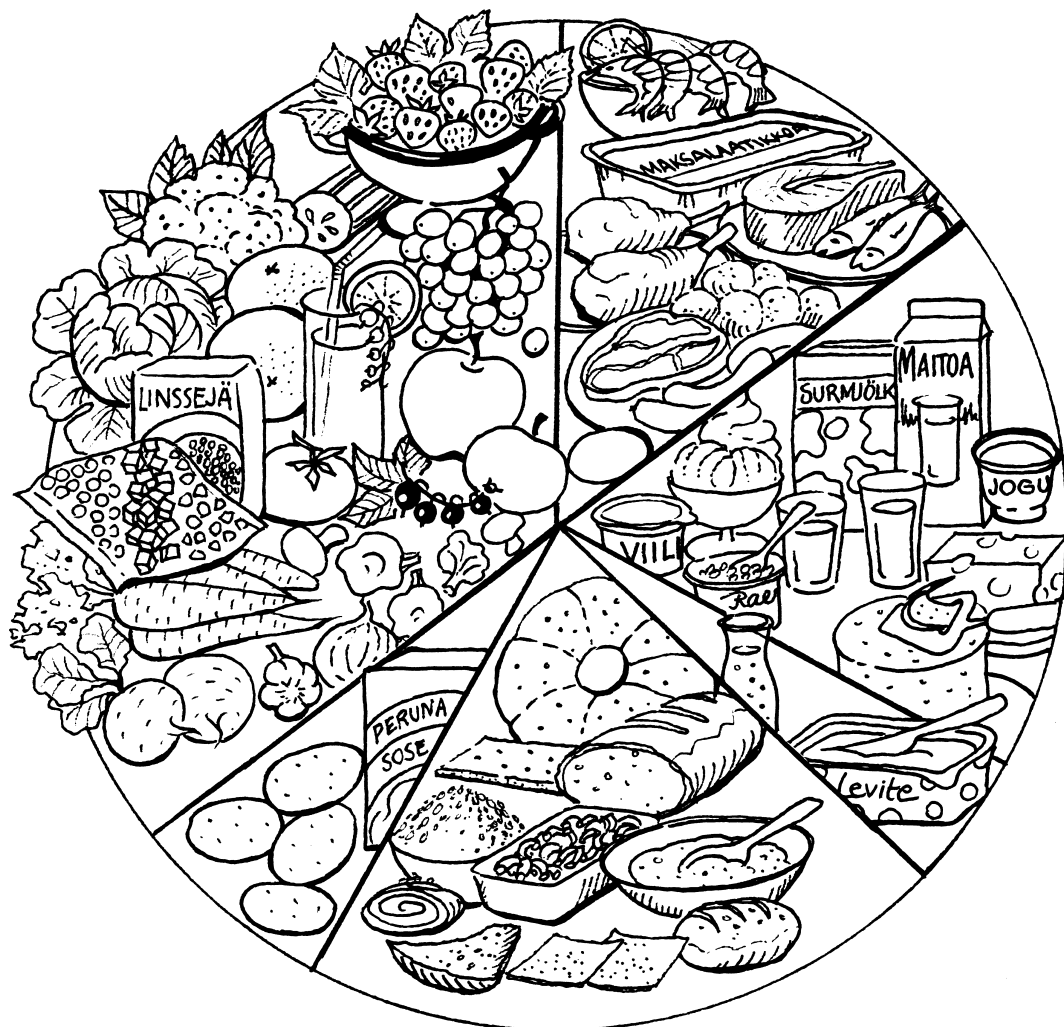
**G**ood food is tasty, varied and colourful. In a good diet the amount of food is just right so that the energy intake corresponds to the energy expenditure.

Dietary models have been developed to illustrate verbal nutrition recommendations. Finns came to know the food circle as early as the 1950s. The recommendations issued by the National Nutrition Council in 1978 presented a food pyramid in addition to the food circle. The food circle was revised in the 1987 nutrition recommendations.

The food circle, food pyramid and plate model have been chosen as dietary models in these recommendations. They are suitable for different uses and complement each other in guidance and education.

The food circle (Figure 1) illustrates the variety and proportions of each food group in the diet. Something from each sector of the circle is chosen for the daily diet. A varied diet is achieved when different foods are alternately chosen from the sectors of the circle.

Figure 1.  
Food circle



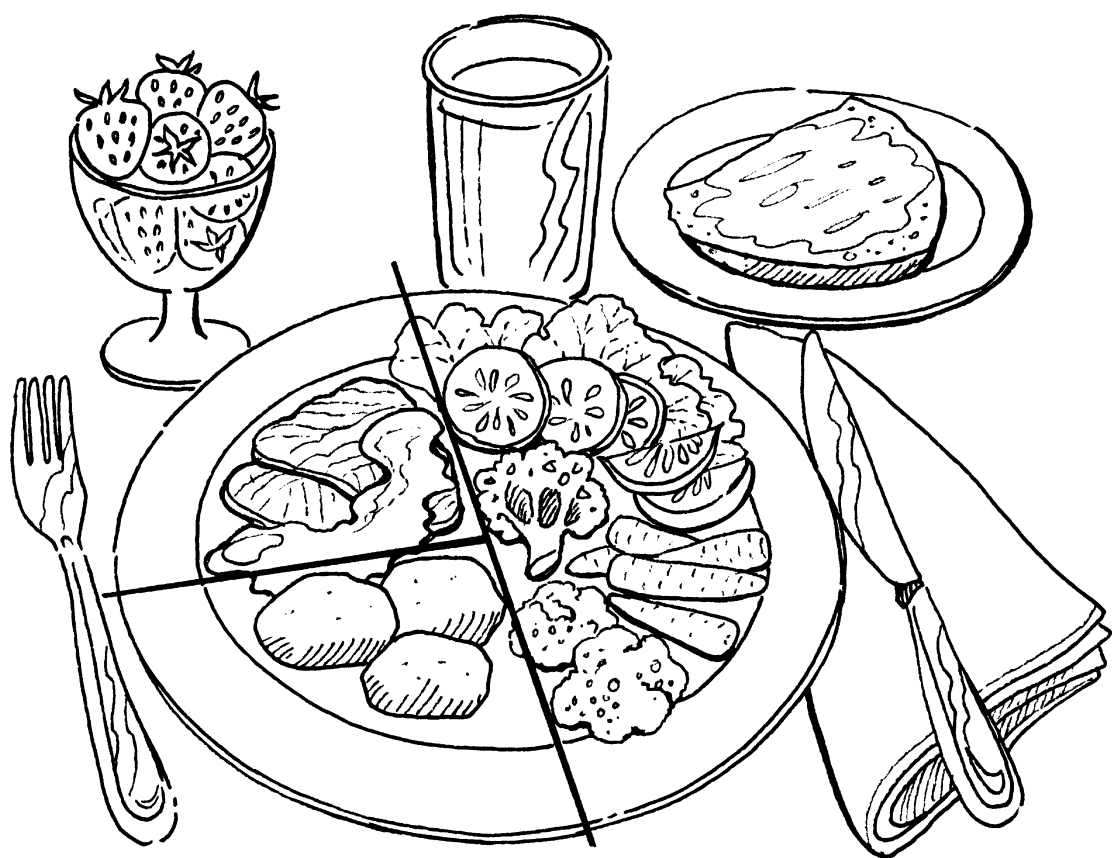
**The food pyramid** (Figure 2) consists of four levels. The base of the pyramid forms the basis of the diet. There you find cereal products, which are good to eat at each meal. Potatoes also belong to the base of the pyramid. The foods in the base are familiar, accepted and economic. You can eat generous servings of these foods. On the next level are vegetables, fruits and berries. These contain a lot of vitamins and minerals yet little energy, and thus can be consumed daily. The second level – meat, fish and dairy products – contains several essential nutrients. It is good to choose fat-free or low-fat varieties of these foods. At the top of the pyramid you find fat and sugar and foods that contain these, such as chocolate, sweets and sugared soft drinks. These all contain a lot of energy but limited amounts of essential nutrients, so intake of these foods should be limited.

**Figure 2.**  
**Food pyramid**



**The plate model** (Figure 3) illustrates the composition of a meal. In the model of a good meal half of the plate should be covered with vegetables such as salads or grated roots. Part of the vegetables can be cooked. A fourth of the plate is reserved for potatoes, rice and pasta and the last fourth is left for a fish or meat dish. The model presented is a meal based on potatoes and meat but soups, stews, cereal and vegetable dishes can also constitute the main meal. In a vegetarian diet meat is substituted with beans and seeds. Skim or low-fat milk, sour milk or water are good drinks to accompany the meal. In addition, one or two pieces of bread with a light touch of vegetable margarine or blend are part of the meal. Berries or fruits as dessert complement the meal. The dairy component or dessert can also be eaten as a snack.

**Figure 3.**  
**Plate model**



## 2.1.

### **Variety and colour**

The nutritional quality of a diet is improved by small changes in food habits, which do not require a lot of effort. When you have a versatile, varied and moderate diet you get an adequate amount of all essential nutrients. The smaller the energy need the more important are the right food choices to ensure an adequate intake of all essential nutrients. In particular, the elderly, weight-watchers and women doing sedentary work must have a versatile diet to get the nutritional benefit they need from their meals.

#### **A lot of cereal products**

A variety of whole meal products such as bread, pasties, porridge, muesli, rice and pasta should be chosen for daily consumption. Varieties with low salt content are recommended. Yeast dough is preferable instead of greasy short bread or puff pastry when making pastries and other desserts.

#### **Dairy products suitable**

Low-fat or fat-free dairy products including low-fat cheese are part of the daily diet and secure adequate calcium intake. Milk, sour milk, yoghurt or cheese are included in the daily meals or snacks. Varieties with low lactose content are also available, as are vegetable fat based cheeses. Liquid dairy products are a better choice for fulfilling the calcium need than completely substituting these with cheese since it contains more hard fat and salt.

#### **A variety of potatoes**

A lot of potatoes may be eaten. At meals a fourth of the plate is reserved for potatoes. Potatoes are versatile food, good sources of starch and contain only a little energy. Preferably, potatoes should be prepared without adding fat, and low fat varieties of potato products should be chosen.

#### **Vegetables, berries and fruits offer colour and variety**

A lot of vegetables, berries and fruits may be eaten daily. Vegetables can be used on bread and in salads. Root crops and berries can also be used in cooking. Dishes with beans or peas can substitute meat or fish at the main meal. Roots can be added to meat dishes.

A part of the vegetables can be eaten fresh and uncooked. Instead of drinking juices it is better to eat whole fruits and berries. By trying out new vegetables, variation in the diet can be enhanced while discovering new tastes. Salad dressings based on juice and oil add flavour and juiciness to salads.

### **Fish often and low fat meat**

Low fat meat is recommended for food preparation. For cold cuts alternatives with low fat, low salt contents are recommended. Choosing different kinds of fish can encourage higher fish consumption. It is good to eat a fish meal at least twice a week, and it is preferable to prepare fish and meat without adding fat. Cooking vegetables and fruits with these dishes makes them flavourful and juicy.

### **Little fat**

A light touch of vegetable margarine or blend may be used on bread. Vegetable oil such as rapeseed oil is recommended for cooking and baking. The use of oil based salad dressings is also recommended, but it is important to control the total intake of fat.

### **Sugar sparingly**

Sugar intake should be limited for the sake of dental health, and the consumption of sugared foods should be reserved to meals. By avoiding regular consumption of sugared beverages and snacks – and particularly by limiting the continuous sucking of sweets – the risk of caries can be lowered.

## **2.2.**

### **Appropriately and adequately**

To prevent overweight, it is important to eat according to the body's needs. A lot of exercise and physical activities at work and during leisure time allow bigger amounts of food to be eaten, resulting in larger intakes of nutrients.

## **2.3.**

### **Enjoy unhurriedly**

Good food tastes good. Tasty food is pleasurable and makes you feel good. A varied and versatile diet also enhances the gastronomic experience. A good diet separates everyday foods from feasts. Repeated, everyday food choices influence the quality of the total diet, whereas an occasional feast can depart from the recommended. Food should be enjoyed without feelings of guilt or anxiety.

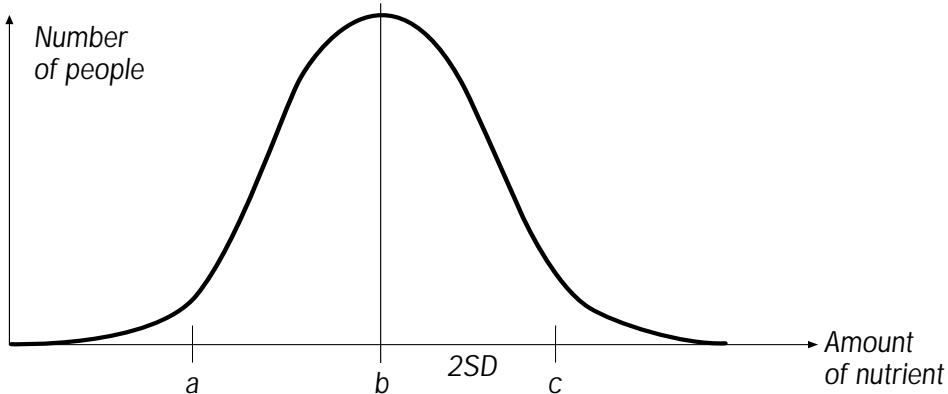
A peaceful eating occasion offers an opportunity to enjoy the taste and smell of food, as well as daily relaxation. A meal is also often a social event. Eating a meal with others goes beyond the physical need to satisfy hunger.

### 3 Nutrient recommendations

These nutrition recommendations differ somewhat from the recommendations issued by the National Nutrition Council in 1987. These recommendations emphasise the balance between energy intake and expenditure and the importance of exercise. The relationships between energy yielding nutrients and fatty acids are specified; the recommended intake for sodium is lower; and the maximum intake of alcohol is included. The recommended daily intakes for some nutrients have been adjusted, and recommendations are issued for certain new nutrients: Vitamin D, Vitamin E, Vitamin B<sub>12</sub>, folate, potassium, phosphorus and selenium. The nutrient recommendations are presented both as an average daily intake and as energy-standardised intakes.

The recommendations are primarily valid for groups of healthy subjects with moderate physical activity. They must be used with caution when giving individual nutrition advice due to the disparities in nutrient requirements from person to person. The nutrition recommendations are valid for the average intake over a longer period of time, such as a month. The requirements of some special groups such as vegetarians and people with lactase deficiency, and others with special circumstances such as pregnant and lactating women, have been taken into consideration. The recommended figures do not take into account nutrient loss resulting from food preparation and cooking.

Three reference values have been presented: recommended dietary allowance, estimated average requirement and minimum intake (Figure 4).



**Figure 4.**  
**Minimum intake (a), estimated average requirement (b)**  
**and recommended dietary allowance (c).**

The estimated average nutrient requirement is the nutrient intake value estimated to meet the average requirement of the population or population groups (b). The recommended dietary allowance (c) is the daily dietary intake level that, based on current information, is sufficient to meet the nutrient requirements and maintain a good nutritional status of nearly all healthy individuals (97.5%) and includes the variation in the population's needs. Incomplete utilisation of different nutrients has been taken into account. The recommended intake is calculated by adding a safety margin equal to two standard deviations of the estimated average requirement ( $b + 2 \text{ SD}$ ). The minimum intake (a) is the minimum amount that prevents deficiency. However, the amount of nutrients in the daily diet corresponding to the minimum intake is not enough to maintain a good nutritional status, which could result in deficiency symptoms in some individuals.

The principle used to prepare different nutrition recommendations is basically the same. Different average requirements and dispersion values cause the differences. These recommendations are based on the Nordic Nutrition recommendations, which in turn are based on scientific findings.

In addition to the dietary reference values the recommendations include values for upper limits for average daily intake for adults for 13 nutrients. These are included to warn that long-term intakes exceeding these levels may induce a risk of adverse health effects.

## **3.1. Recommended intake of nutrients**

### **3.1.1. Balancing energy intake and expenditure**

*Too little or too much intake of energy compared to energy expenditure may have adverse health effects.*

*The combination of physical activity and good food habits prevents obesity and maintains health.*

Table 1 presents the estimated average energy requirements for different age groups of men and women doing sedentary work. The estimated average energy requirements are calculated by estimating the basal metabolic rate based on weight and age and multiplying this with a physical activity coefficient (PAL, physical activity level). The requirement is estimated for an average man weighing 70 kg and an average woman weighing 60 kg. PAL refers to the total energy expenditure per day in relation to the basal metabolic rate. These recommendations have used a PAL of 1.7 for people doing sedentary work and regular physical activity, and 1.4 for people with

**Table 1.**  
**Reference values for energy requirements in groups**  
**of adults with moderate to low physical activity.**

	<i>Sedentary work and regular physical activity<sup>1</sup></i> (PAL <sup>2</sup> = 1.7)		<i>Sedentary work and no or limited physical activity<sup>1</sup></i> (PAL <sup>2</sup> = 1.4)	
	<i>Mean energy requirement (range)</i>	<i>Mean energy requirement (range)</i>	<i>Mean energy requirement (range)</i>	<i>Mean energy requirement (range)</i>
	<i>MJ/day</i>	<i>MJ/day</i>	<i>MJ/day</i>	<i>MJ/day</i>
	<i>kcal/day</i>	<i>kcal/day</i>	<i>kcal/day</i>	<i>kcal/day</i>
<b>Males<sup>3</sup></b>				
19–30 years	12.4 (11.3–13.6)	10.2 (9.4–11.2)	2980 (2720–3260)	2450 (2240–2680)
31–60 years	12.1 (11.2–12.9)	10.0 (9.3–10.7)	2740 (2690–3100)	2390 (2220–2560)
61–75 years	10.9 (10.0–11.7)	8.9 (8.2–9.6)	2610 (2400–2800)	2140 (1970–2300)
> 75 years	10.0 (9.4–10.6)	8.2 (7.7–8.7)	2400 (2250–2520)	1970 (1850–2070)
<b>Females<sup>3</sup></b>				
19–30 years <sup>4</sup>	9.8 (9.2–10.9)	8.1 (7.5–8.9)	2350 (2200–2610)	1930 (1800–2140)
31–60 years <sup>4</sup>	9.7 (9.0–10.2)	8.0 (7.4–8.4)	2310 (2170–2440)	1910 (1780–2010)
61–75 years	8.9 (8.1–9.5)	7.3 (6.7–7.9)	2120 (1950–2270)	1740 (1610–1880)
>75 years	8.7 (8.0–9.4)	7.2 (6.5–7.7)	2080 (1910–2250)	1720 (1570–1850)

Sources: Commission of the European Communities 1993, Black et al. 1996

- 1) Sports or other physical activity for at least 30 minutes 4-5 times a week.
- 2) PAL is the physical activity level.  
 PAL takes into account both leisure and work activity.  
 PAL = total energy expenditure divided by basal metabolic rate (BMR).
- 3) A body weight of 70 kg for men and 60 kg for women is the reference.  
 Range  $\pm 10$  kg
- 4) The energy requirement increases on average 1.1 MJ/day during the two last trimesters of pregnancy and 2.0 MJ/day during lactation.  
 The increased energy requirement is usually compensated by the decrease in physical activity at the end of pregnancy.

**Table 2.**  
**Reference values for energy requirements**  
**in children and adolescents of different ages.**

Group	Age	Weight (kg)	Mean energy requirement (range)	
			MJ/day <sup>1</sup>	kcal/day
Children	1 month	4.4	2.1	(1.5–2.7)
			500	(360–650)
	3 months	6.2	2.6	(2.0–3.2)
			620	(480–770)
	6 months–1 year	9.0	3.6	(2.5–4.8)
			860	(600–1150)
	1–3 years	14.7	5.9	(3.2–7.3)
			1410	(770–1750)
Boys	4–6 years	19.3	7.1	(5.2–9.3)
			1700	(1240–2270)
	7–10 years	27.8	8.5	(6.2–11.2)
			2030	(1480–2680)
	11–14 years	41.3	9.8	(6.0–13.6)
			2340	(1440–3250)
	15–18 years	61.8	11.3	(6.7–15.1)
			2700	(1600–3610)
Girls	4–6 years	19.1	6.8	(4.7–9.2)
			1630	(1120–2200)
	7–10 years	27.3	7.5	(5.3–9.8)
			1790	(1270–2340)
	11–14 years	43.0	8.4	(4.9–11.3)
			2010	(1170–2700)
	15–18 years	55.4	9.0	(6.2–11.3)
			2150	(1480–2700)

Source: Nordic Nutrition Recommendations 1996

1) For the age group 11-14 years the PAL (physical activity level) is set at 1.65 and 1.55 for boys and girls, respectively, and for the age group 15-18 years PAL is set at 1.58 and 1.50, respectively. The ranges are based on variation in body weight +2 SD.

no or limited physical activity. These PAL coefficients are smaller than the ones used for the Nordic Nutrition Recommendations because the reference values for energy needs based on these coefficients better correspond to energy intake.

The energy reference values are only for groups of individuals. The individual energy intakes vary considerably and depend on, among other things, basal metabolic rate, body weight, physical activity, age and gender.

Table 2 presents reference values for average energy requirements in children and adolescents. The reference values for children 0–10 years old are based on energy intakes in healthy children. For the age group 11–18 years the values are based on estimated basal metabolic rate at average weight for age multiplied by a PAL coefficient.

### **3.1.2. Recommended intake of energy yielding nutrients for adults and children over three years of age**

The recommendations apply to recommended intakes of carbohydrate, fat and protein in the diets of adults and children over three years of age. These recommendations present the proportions of energy yielding nutrients without taking into account the energy from alcohol. To account for alcohol in the figures, accordingly decrease the proportions (E%) of the other energy yielding nutrients.

#### **Carbohydrates**

*Carbohydrates should supply 55–60% of the total energy intake.*

*The intake of dietary fibre<sup>1</sup> in adults should be 25–35 g/day, i.e. approximately 3 g/MJ (12.6 g/1000 kcal).*

1) Dietary fibre is an indigestible part of carbohydrate rich foods, which does not yield energy

For most people, this recommendation means a significant increase of carbohydrate rich foods in the diet, such as cereal products, potatoes, roots, vegetables, fruits and berries. These foods are also rich in vitamins, minerals, dietary fibre and antioxidants. A high carbohydrate intake maintains bodily functions and prevents obesity and associated health hazards. A large intake of dietary fibre balances sugar and fat metabolism, stabilises the digestive tract and may prevent colon cancer.

To achieve the recommended fibre intake, it is necessary to limit sugars and fat in the diet. For children and adults with a low energy intake (<8 MJ/day) the intake of refined sugars should not exceed 10% of the total energy intake to ensure an adequate supply of all essential nutrients.

## Fat

**The intake of hard fat (saturated fatty acids + trans-fatty acids<sup>1</sup>) should be limited to approximately 10% of the total energy intake.**

*The intake of cis-monounsaturated fatty acids<sup>1</sup> should be 10–15 E% and the intake of polyunsaturated fatty acids 5–10 E%.*

*Essential polyunsaturated (n-6 and n-3)<sup>2</sup> fatty acids should contribute at least 3 E% including approximately 1 E% of n-3 fatty acids.*

*In diets of pregnant and lactating women, essential polyunsaturated (n-6 and n-3) fatty acids should contribute at least 5 E%.*

**The proportion of fat is approximately 30% of the total energy intake.**

*This amount includes both glycerol and fatty acids.*

*Thus the amount of fatty acids is approximately 28 E%.*

1) Trans-fatty acids are unsaturated fatty acids, which have a double binding in trans-position. Trans-fatty acids are created when unsaturated fats are industrially hardened and as a natural fermentation product in ruminants' rumen. Trans-fatty acids behave like saturated fatty acids in the body. In nature most double bindings of fatty acids in dietary fat are in cis-position

2) N-6 and n-3 fatty acids are polyunsaturated. The number refers to the position of the double bindings in the fatty acid chain. Linoleic acid (C18:2n-6) is the pre-stage of n-6 fatty acids and, correspondingly,  $\alpha$ -linolenic acid (C18:3n-3) is the pre-stage of n-3 fatty acids.

For cardiovascular disease prevention it is recommended to reduce the intake of hard fat to the recommended 10 E%. Concurrently, cholesterol intake decreases. Hard fat and cholesterol increase the LDL cholesterol concentration in serum<sup>1</sup>, which is a strong risk factor for cardiovascular diseases.

The LDL-cholesterol concentration in serum decreases if hard fat is substituted with polyunsaturated fatty acids. However, an intake of polyunsaturated fatty acids higher than 10 E% is not recommended because they easily peroxidase, and peroxidased products are harmful. Monounsaturated cis-fatty acids do not peroxidase as easily as polyunsaturated fatty acids, although they are by large as effective as polyunsaturated fatty acids in lowering the LDL cholesterol concentration in serum. Therefore, rapeseed oil and olive oil, which contain monounsaturated fatty acids, are recommended. The fatty acids in fish fat are polyunsaturated and thus regular fish consumption improves the diet's fatty acid content.

<sup>1</sup> Low density lipoprotein, protein in the blood that transports cholesterol to the tissues

A reduction of total fat intake to the recommended level prevents obesity and makes it possible to increase the intake of nutrient rich foods and improve the nutritional quality of diet. From a health point of view it is not useful to reduce the total intake of fat to under 20–25 E%.

## Protein

*Protein should provide 10–15% of the total energy intake.*

The energy percent for protein can be lower than the recommendation without creating the risk of inadequate intake. In practice the intake is adequate if the diet includes a variety of foods with an emphasis on carbohydrate rich foods. If the energy intake is very low, below 6.5 MJ/day (1600 kcal/day), protein should supply 15–20% of the energy intake.

### 3.1.3. Recommendations on energy yielding nutrients for children

The recommended proportions of energy yielding nutrients varies over the three first years according to the child's growth and stage of development (Table 3). A child needs a lot of energy in relation to his or her body size. In relation to body size a large energy requirement among infants requires that the food's energy density<sup>1</sup> is not below 2.8 kJ/kg, the average energy density of breast milk.

Fat is the most important energy source for infants because of its high energy density. The proportion of fat in the diet is almost half among children 0–6 months of age.

*The intake of essential n-6 fatty acids should contribute at least 4.5% of the energy intake for children up to 1 year and at least 3% of the energy intake for the age group 1–3 years.  
A minimum intake of 0.5 E% is recommended for n-3 fatty acids.*

Children can eat larger quantities of food as they grow and, to a larger degree, it is possible to fulfil the energy requirement with carbohydrates. The recommended intake of fat for 1–3-year-olds is almost the same as for adults (30%) or slightly higher (35%), and the corresponding proportion of carbohydrates is 50–55%. A large amount of dietary fibre increases the volume of food and decreases the energy density. This could be a problem for infants. The intake of dietary fibre is approximately 2 g/MJ among Finnish children 1–3 years of age, but it could be larger.

<sup>1</sup> Energy density = the energy provided by a food per weight unit.  
If the energy density is large, a small amount of food provides a lot of energy.

**Table 3.****Recommended intake of energy yielding nutrients as a percentage of total energy for children 0–3 years.***This recommendation is not valid for breast-fed children.*

	<i>g/MJ</i>	<i>(g/100 kcal)</i>	<i>Energy percent</i>
0–6 months (not valid for breast-fed children)			
Protein	4–6	(1.7–2.5)	7–10
Fat	10.5–14.5	(4.4–6.1)	40–55
Carbohydrates			35–55
6–12 months			
Protein	4–6	(1.7–2.5)	7–10
Fat	9–12	(3.8–5.0)	30–40
Carbohydrates			45–60
1–3 years			
Protein	6–9	(2.5–3.8)	10–15
Fat	8–9	(3.0–3.8)	30–35
Carbohydrates			50–55

**3.1.4. Recommended daily intake of vitamins and minerals**

The recommended intake of vitamins and minerals is presented in table 4. The values include a safety margin, which has been calculated by adding 2 standard deviations to the mean estimated requirement. This is an attempt to ensure an adequate intake in almost the entire population (see *Figure 4, page 16*). The values for recommended intake cannot as such be applied in assessing individual diets or in nutrition education for individuals. It is not possible to make recommendations on some nutrients because the information on their requirements is currently inadequate.

**Table 4. Recommended intake of nutrients, expressed as the average daily intake per person and day. These are intended for use in diet planning for groups<sup>1</sup>. The individual requirements are often lower than the recommendations on the population level.**

Age Years	Vitamin A RE <sup>2</sup>	Vitamin D µg	Vitamin E α-TE <sup>3</sup>	Thiamine mg	Riboflavin mg	Niacin NE <sup>4</sup>	Vitamin B <sub>6</sub> mg	Folate µg	Vitamin B <sub>12</sub> µg	Vitamin C mg
Children	< 1/2 <sup>5</sup>	10	3	0.3	0.4	5	0.3	35	0.3	30
	1/2-1	10	4	0.4	0.5	6	0.5	50	0.6	35
	1-3	10	5	0.7	0.8	9	0.8	75	1.0	40
	4-6	5	6	0.8	1.0	11	0.9	100	1.1	45
	7-10	5	7	1.0	1.1	13	1.1	150	1.4	45
Males	11-14	900	5	1.2	1.4	16	1.3	240	2.0	50
	15-18	900	5	1.4	1.6	18	1.5	300	2.0	60
	19-30	900	5	1.4	1.6	19	1.5	300	2.0	60
	31-60	900	5	1.4	1.6	18	1.5	300	2.0	60
	61-75	900	10	1.2	1.4	16	1.4	300	2.0	60
	>75	900	10	1.1	1.3	15	1.2	300	2.0	60
Females	11-14	800	5	1.0	1.2	13	1.1	240	2.0	50
	15-18	800	5	1.1	1.3	14	1.2	300	2.0	60
	19-30	800	5	1.1	1.3	15	1.2	300	2.0	60
	31-60	800	5	1.1	1.3	15	1.2	300	2.0	60
	61-75	800	10	1.0	1.2	13	1.1	300	2.0	60
>75	800	10	1.0	1.2	13	1.1	300	2.0	60	
Pregnant	800	10	10	1.5	1.6	17	1.4	400 <sup>6</sup>	2.0	70
Lactating	1200	10	11	1.6	1.7	20	1.5	400	2.6	90

1) The recommended intake refers to amounts from consumed food. Nutrient loss during preparation, cooking, etc. must be taken into account when planning diets.

2) Retinol equivalents (RE) = 1 µg retinol or 6 µg β-carotene.

3) α-tocopherol equivalents (α-TE) = 1 mg d-α-tocopherol

4) Niacin equivalents (NE) = 1 mg niacin or 60 mg tryptophan

5) Breast milk or infant formula primarily fulfills the energy and nutrient requirements of infants up to 6 months of age.

6) The increased need for folate during pregnancy can be fulfilled with a recommended diet. To ensure adequate intake among pregnant women or women planning pregnancy, folic acid supplements are recommended if their consumption of fresh vegetables, fruits and berries and whole meal cereal products is low.

Age	Iron <sup>7</sup>	Zinc <sup>8</sup>	Iodine	Selenium	Calcium	Phosphorus	Potassium	Magnesium
Years	mg	mg	µg	µg	mg	mg	g	mg
Children	< 1/2 <sup>5</sup>	2	40	10	360	280	0.8	50
	1/2-1	5	50	15	540	420	0.8	80
	1-3	5	70	20	600	470	0.8	85
	4-6	6	90	25	600	470	1.1	120
	7-10	7	120	30	700	540	2.0	200
	Males							
11-14	12	11	150	40	900	700	3.1	280
15-18	12	12	150	50	900	700	3.5	350
19-30	10	9	150	50	800 (900) <sup>12</sup>	600 (700) <sup>12</sup>	3.5	350
31-60	10	9	150	50	800	600	3.5	350
61-75	10	9	150	50	800 <sup>13</sup>	600	3.5	350
>75	10	9	150	50	800 <sup>13</sup>	600	3.5	350
Females								
11-14	12-18 <sup>9</sup>	8	150	40	900	700	3.1	280
15-18	12-18 <sup>9</sup>	9	150	40	900	700	3.1	280
19-30	12-18 <sup>9</sup>	7	150	40	800 (900) <sup>12</sup>	600 (700) <sup>12</sup>	3.1	280
31-60	12-18 (10) <sup>10</sup>	7	150	40	800	600	3.1	280
61-75	10	7	150	40	800 <sup>13</sup>	600	3.1	280
>75	10	7	150	40	800 <sup>13</sup>	600	3.1	280
Pregnant	- <sup>11</sup>	9	175	55	900	700	3.1	280
Lactating	12-18	11	200	55	900	700	3.1	280

7) Meal composition affects the absorption of non-hem iron of plant origin.

Vitamin C, meat and fish improve the absorption of iron, while the polyphenols in vegetables and the phytic acid in cereal products impair it.

8) The recommendation is given for a mixed diet.

The recommendation is 25-30% higher in a vegan diet. Animal protein improves the absorption of dietary zinc, while phytic acid in cereal products impairs it.

9) The loss of iron due to menstruation can vary a lot, so the iron requirement for women is individual. Iron intake, however, should be at least 12 mg. The iron from a vegetarian diet is absorbed less.

Some women need iron supplementation (see chapter 3.3).

10) The recommended daily intake is 10 mg for postmenopausal women.

11) Iron balance during pregnancy requires an iron storage of 500 mg.

The increased iron requirement after the first trimester of pregnancy is difficult to fulfil without iron supplements (see chapter 3.3).

12) 900 mg calcium and 700 mg phosphorus is recommended for 19-20-year-olds.

13) Increasing the calcium intake by 500-1000 mg per day can possibly prevent some degree of bone loss.

### 3.1.5. Recommended energy-standardised intake of vitamins and minerals (nutrient density)

Nutrient density is a good reference for planning the diets of population groups (Table 5). The nutrient density recommendation is based on a population group with the highest requirement. These recommendations are not suitable for planning diets for special groups such as pregnant or lactating women or children under 7 years of age – and not if the group's energy requirement is exceptionally low (< 8 MJ/day) or high (>12.5 MJ/day).

### 3.1.6. Recommendations concerning intake of sodium (salt)

It is desirable to gradually reduce the sodium intake in adults to 5 g table salt (NaCl) per day. This amount corresponds to a sodium density of approximately 0.5 g/MJ (2.1 g/1000 kcal). The diet of children under 1 year of age should contain no salt and the diet in early childhood (1–3 years) should be very low in salt. The average salt intake of children under the age of 3 should not exceed 0.5 g/MJ (about 3 g table salt per day).

**Table 5.**

**Recommended nutrient density.**

**The recommendations are best suited for groups of individuals who have an average energy requirement of 8–12.5 MJ/day.**

<i>Nutrient</i>	<i>Recommendation/MJ</i>	<i>Recommendation/1000 kcal</i>
Vitamin A, RE	100	420
Vitamin D, µg	0.6	2.5
Vitamin E, α-TE	1.0	4.2
Thiamine, mg *)	0.13	0.5
Riboflavin, mg	0.14	0.6
Niacin, NE	1.6	6.7
Vitamin B <sub>6</sub> , mg	0.13	0.5
Folate, µg	36	150
Vitamin B <sub>12</sub> , µg	0.2	0.8
Vitamin C, mg *)	7	30
Calcium, mg *)	110	460
Phosphorus, mg	85	355
Potassium, g	0.37	1.5
Magnesium, mg	34	140
Iron, mg *)	1.4–2.1	6–9
Zinc, mg	1.1	4.6
Jodine, µg	18	75
Selenium, µg	5	20

\*) It is usually sufficient to check these nutrients when planning and evaluating diets.

The goal is to adjust taste preferences to low salt. This succeeds best if no salt or low salt varieties of foods are chosen and by gradually decreasing the amount of salt in cooking. Instead of salt, food can be flavoured with a variety of vegetables, herbs, no salt spices and low sodium salt.

### **3.1.7. Recommendations concerning consumption of alcohol**

From a nutritional point of view it is justifiable to recommend that alcohol not exceed 5% of the total energy intake. At the most, this corresponds to 15 g per day for women and 20 g for men. Pregnant women and adolescents are recommended to abstain completely from alcohol because of its adverse effects.

#### ***Alcohol content of beverages***

<i>Beverage</i>	<i>Serving</i>	<i>Alcohol content %</i>	<i>Alcohol amount g</i>
Beer	0.33 l	3.7	12.2
Wine	12 cl	12	14.4
Vodka	4 cl	38	15.2

### 3.2.

#### Values for the evaluation of low and high intakes

The lowest acceptable intake level is defined as the minimum amount that upholds storage and prevents the development of deficiency diseases. In the regular daily diet, the minimum is not sufficient to uphold a good nutritional status and nutrient storage among the total population, and could lead to deficiency symptoms in some individuals. The lowest level of intake (Table 6) is useful for evaluating the results of dietary studies together with those of clinical studies.

**Table 6.**

#### **Minimum average daily intake of certain nutrients.**

*The values are to be used only for evaluating the results of dietary surveys to support clinical studies.*

	Men 15–50 years	Women 15–50 years
Vitamin A, RE	600	600
Vitamin D, µg	2.5 <sup>1</sup>	2.5 <sup>1</sup>
Vitamin E, α-TE	4	3
Thiamine, mg	0.6	0.5
Riboflavin, mg	0.8	0.8
Niacin, NE	11	9
Vitamin B <sub>6</sub> , mg	1.0	0.9
Folate, µg	100	100
Vitamin B <sub>12</sub> , µg	1	1
Vitamin C, mg	10	10
Calcium, mg	400	400
Phosphorus, mg	300	300
Potassium, g	1.6	1.6
Iron, mg	7	– <sup>2</sup>
Zinc, mg	5	4
Iodine, µg	70	70
Selenium, µg	20	20

1) Refers primarily to those 60 years of age and older

2) The minimum intake cannot be defined without accounting for iron storage.

Excessive intake is equal to pharmacological or toxic amounts of nutrients. Harmful amounts of nutrients do not normally come from food. In general, the pharmacological use of nutrients is not taken into account in nutrition recommendations. Excessive intakes of Vitamin A and D, iron, selenium and iodine may cause toxic symptoms whereas excessive intakes of other nutrients have milder negative effects. Slightly excessive intake may affect digestion or decrease the absorption of other nutrients. Because the information on the harmful effects of excessive intakes are based on single research reports, the maximum values presented in Table 7 should only be interpreted as trendsetting.

**Table 7.**

***Upper limit for average daily intake of certain nutrients.***

*A higher intake of vitamin A and D, iron, iodine and selenium can give clear toxic effects whereas the negative effects of other nutrients are of milder nature.*

<i>Nutrient</i>	<i>Maximum daily intake</i>
Vitamin A, µg <sup>1</sup>	7500 <sup>2</sup>
Vitamin D, µg	50
Niacin, mg <sup>3</sup>	500
Vitamin B <sub>6</sub> , mg	50
Folate, µg	1000
Vitamin B <sub>12</sub> , µg	100
Vitamin C, mg	1000
Calcium, mg	2500
Phosphorus, mg	5000
Iron, mg	60
Zinc, mg	45
Iodine, µg	1000
Selenium, µg	300

1) µg retinol.

2) Daily intakes larger than 3000 µg retinol during pregnancy have increased the risk of fetal malformations.

3) Nicotine acid

### 3.3. Recommendations for dietary supplements

To maintain good health, dietary supplements are necessary and recommended for specific age groups or in special circumstances. Recommendations for dietary supplements have been issued for special groups (Table 8). The use of multivitamin supplements is justified if the energy intake is exceptionally low (5 MJ/day, 1200 kcal/day) over a longer time period.

**Table 8.**  
**Recommended dietary supplements**  
**for various age groups or in special circumstances**

<i>Age group or special group</i>	<i>Mixed diet</i> <i>Lactovegetarian diet<sup>1</sup></i>
Infants and small children, 0–3 years	Vitamin D, fluoride <sup>2</sup>
Pre-school and school age children, 4–10 years	Fluoride <sup>2</sup>
Girls and women, 11– 60 years	Iron <sup>3</sup>
Adults, > 61 years	Vitamin D <sup>4</sup>
Pregnancy	Vitamin D <sup>4</sup> , iron <sup>3</sup> , folic acid <sup>5</sup>
Breastfeeding	Vitamin D <sup>4</sup>

1) Lactovegetarian diet that includes dairy products

2) The use of fluoride supplements depends on dental health and the use of fluoridated toothpaste. The dose depends on the fluoride content in drinking water and the child's body weight.

3) The need for iron supplements is individual

4) Supplements are recommended during the dark time of the year (winter)

5) The increased need for folate during pregnancy can be fulfilled with a recommended diet. To ensure adequate folate intake, supplements are recommended for pregnant women and women planning pregnancy whose consumption of fresh vegetables, fruits and berries and whole meal cereal products is low.



## Reference

*Black AE, Coward WA, Cole TJ, Prentice AM. Human energy expenditure in affluent societies: an analysis of 574 double-labelled water measurements. Eur J Clin Nutr 1996;50(Suppl 1):72-92.*

*Commission of the European Communities. Report of the Scientific Committee for Food: Nutrient and energy intakes for the European Community. (Thirty-first series of Food - Science and Techniques). Luxembourg: Office for Official Publications of the European Communities, 1993.*

*Nordic nutrition recommendations 1996. Scand J Nutr 1996;40:161-165.*

*Valtion ravitsemusneuvottelukunta. Suomalaiset ravitsemussuosituksset. Komiteamietintö 1998:7. Oy Edita Ab, Helsinki 1998.*

## Finnish Nutrition Recommendations

The nutrition recommendations issued by the National Nutrition Council have been renewed. The goal of the recommendations is to define the appropriate nutrient intakes for population groups and to evaluate the goals for improving public health.

The recommendations can be used for planning mass catering, as basic material for nutrition education and training and as reference values when estimating food consumption and nutrient intake of groups.

The publication includes recommendations for the basic composition of diet and nutrient intake and advice on food choice.



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