

Types of food

Definition

Food is a substance or product (processed or unprocessed) that is intended for human consumption or reasonably expected to be consumed, including beverages, chewing gum, drinking water and other substances that become part of it during production, preparation or handling foods.

Types of food

Foods of *animal origin* include meat, meat products and eggs, milk and milk products. Foods of *plant origin* include cereals, legumes, fruits and vegetables. The group fats and oils includes both animal (fats) and plant products.

Food of animal origin

Meat

Meat has played a significant role in the diet throughout human development – and still has considerable cultural significance. According to some theories, meat, as a quality food rich in energy and nutrients, played an important role in human evolution. Hunter-gatherers gradually developed into herding communities or people domesticated animals and gradually became farmers. With the development of agriculture, meat became a less important part of the diet, but to this day, in many cultures, the importance of meat exceeds its importance only as food. An example could be serving a certain type of meaty dish as an integral part of that festive occasion. Cultural and religious prejudices, injunctions and prohibitions regarding food are particularly relevant to meat. The same applies to a number of alternative types of eating. Meat is not an essential part of the diet, and vegetarian communities show no signs of malnutrition if the total food intake is adequate and varied, but the nutrition of millions of people would be substantially improved by the addition of small amounts of animal foods to the diet. Meat is an important source of protein (15 to 20% by weight), fat, vitamin B12, potassium, phosphorus, magnesium, iron, copper and zinc. Carbohydrates are almost non-existent in meat. The composition of the meat depends on the ratio of fat and non-fat parts, which determines not only the energy content, but also practically all nutrients, which are in different concentrations in the fat and in the lean part. Inorganic components are found most in the lean part, therefore their content is lower in fatty meat. Fat-soluble vitamins are present in fat and their content depends on the animal's feed. The composition of the meat also depends on the type of animal, slaughter weight and method of slaughtering. For example, the demand for leaner meat has led to a change in production: pigs are slaughtered with a lower slaughter weight and therefore less fat, and for example, chops today definitely have less fat on the edges than they used to. The high bioavailability of inorganic nutrients contained in meat is very important. Heme iron contained in meat is absorbed on average from 25%, with iron deficiency up to 40%, while non-heme iron is absorbed to a much lesser extent, e.g. 10% from cow's milk.

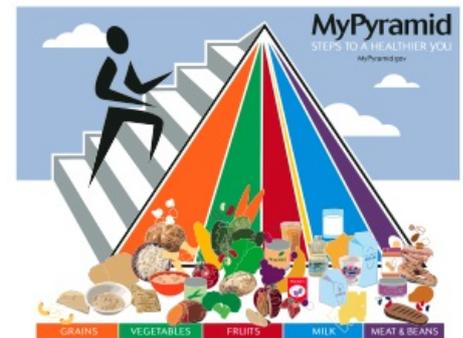
Fish

Fish are a source of high-quality protein and similar minerals as the meat of warm-blooded animals. Some types of white-fleshed fish, such as pike, trout, zander and tench, are very low in fat and their meat consists mainly of muscle with a thin envelope of connective tissue. Oily, darker-fleshed fish such as herring, mackerel, trout and sardines are excellent sources of very long-chain omega-3 polyunsaturated fatty acids. Fatty fish and fish liver also contain significant amounts of vitamin A and vitamin D. Canned fish such as sardines, anchovies and salmon containing small bones contribute to the supply of calcium. Fish accumulate trace elements from seawater. They are a rich source of iodine, but unfortunately also of toxic metals. Omega-3 fatty acids have a recognized importance in the prevention of cardiovascular diseases due to their significant effect on reducing the level of triacylglycerols in the blood, limited effect on reducing LDL and reducing the risk of thrombus formation. Some epidemiological studies report that even consuming 1-2 fish dishes per week has significant preventive effects. However, the consumption of fish, especially sea fish, is still very low in our population.

Eggs



Food pyramid



Food pyramid - different type (MyPyramid)

Eggs are food with a high content of nutrients, which must fully ensure the development of the embryo. Egg protein has long been the reference protein for evaluating protein quality by amino acid content. A slightly different composition of amino acids is now considered ideal for humans. Egg yolk is rich in phospholipids with a high content of polyunsaturated fatty acids and cholesterol (about **200 mg** in one egg). The bioavailability of iron is low probably due to binding to egg protein. The protein contains avidin, which binds biotin (vitamin H) in a form that is unusable for humans. This effect is canceled in a boiled egg.

Milk and milk products

Milk is the only starting food for almost all young mammals and therefore contains all the nutrients necessary for the growth of the given species. The main proteins are casein, lactalbumin and a number of immunoglobulins. Proteins of high biological value are rich in lysine, an essential amino acid that is deficient in cereals, which can therefore be suitably supplemented when combined with cereals (milk porridge, pasta with cheese). Milk and milk products are the only source of milk sugar (lactose). Ruminant milk contains very little unsaturated fatty acids. Milk contains both fat-soluble and water-soluble vitamins. Their quantity varies according to the type of feeding and is usually higher in summer. Fat-soluble vitamins are quite stable, so their content does not change during processing. The content of water-soluble vitamins is reduced by processing and storage (thiamine by pasteurization, riboflavin by storage in light, vitamin C by storage and heat processing). Milk and milk products are the source of 60% of the calcium in our food. Milk is also a source of phosphorus, potassium and magnesium and, if the feed contains it, iodine. In low-fat milk and milk products, the amount of fat-soluble vitamins is reduced in proportion to the reduction in fat content. On the contrary, by removing fat, the concentration of inorganic nutrients and water-soluble vitamins, which are contained in the "water part", will increase somewhat. Fresh milk is potentially one of the riskiest foods. Pasteurization and control of cattle herds eliminated milk-borne brucellosis and TB in developed countries. Despite the fact that milk contains the carbohydrate lactose, a number of studies have shown that it is not cariogenic and can even have a protective effect. According to several studies, even cheeses can have it. The high level of calcium and phosphates in milk prevents the dissolution of enamel. Milk protein tends to be adsorbed on the surface of the tooth and thus prevent its dissolution, casein can have a specific anti-caries effect. Since fresh milk does not have a shelf life, different ways of processing it have been developed over the ages in order to be able to transport and preserve it, and so nowadays we have a whole range of different milk products. Cheese is made from milk curd. Due to the significant differences in the production of cheeses, their composition is very different, even for one type. Some cheeses can be quite high in salt and should be listed on the package. The salt used should be iodized, especially in areas with endemic iodine deficiency. Fermented milk products are produced by fermenting milk with lactobacilli. Fermentation leads to the formation of lactic acid from lactose, which lowers the pH, which inhibits the growth of a number of pathogenic germs. Apart from lactose, yogurts contain all the nutrients found in milk. The fat content of yogurts should be marked. Low-fat yogurts contain less than 0.5 g of fat per 100 g, reduced-fat yogurts less than 3.0 g, and cream yogurts at least 10.0 g. In recent years, products, especially yogurts, containing so-called probiotic microorganisms have appeared : *Lactobacillus rhamnosus*, *Bifidobacterium lactis*. Studies show their possible positive effects on immunity, reducing the incidence of certain types of cancer and lowering blood cholesterol levels.

Food of plant origin

Cereals

Cereals, which are the seeds of domesticated grasses of the Gramineae species, have a prominent place in nutrition and are the staple food and source of energy for most people in the world. The cultivation of cereals was a key stage in the development of human society. They can be stored, which provided a stable food supply and enabled the development of settled communities and the development of society. In the world, the highest consumption is rice and wheat, followed by corn, sorghum, millet, oats, rye and barley in order of importance. In developed countries, cereals provide about 30% of the daily intake of energy and 25% of protein, in developing countries up to 80% of energy, and in some they are almost the only source of protein at all. According to the WHO, cereals should optimally cover half of the daily energy intake. All cereals have approximately the same nutritional value. They typically contain 7-14% protein, up to 75% carbohydrates and 2-7% fat (oats and corn have more). The Protein of cereals is less valuable compared to animal proteins, especially due to the deficiency of the essential amino acid lysine (wheat), and in some cereals also of tryptophan (corn). Cereals, especially whole grains, contribute significantly to the intake of fiber, minerals (potassium, calcium, magnesium), iron, zinc and most B vitamins. They contain small amounts of a number of other trace elements. Of the fat-soluble vitamins, they contain only vitamin E. If they are not sprouted, they do not contain any vitamin C. The content of non-nutritive substances such as phytosterols, lignans, flavonoids, glucosinolates, phenols and terpenes whose effect is not yet precisely known is also significant.

Legumes

Legumes are a food valued for their protein and fiber content. As a source of protein, they are particularly important in developing countries due to the high price of animal foods. In the dry state legumes contain 20-25% protein of good biological value. Legume protein is relatively rich in the essential amino acids tryptophan and lysine and somewhat deficient in cysteine and methionine. If they are combined with cereals in which the ratio of essential amino acids is just the opposite, the spectrum of amino acids is evened out. Legumes provide 1,400 kJ/100 g, so they are also a good source of energy and usually contain a relatively significant amount of calcium, phosphorus, B vitamins, folic acid and iron (4-15 mg/100 g), which, however, are absorbed more poorly than from animal resources. They do not contain fat-soluble vitamins. Dry legumes do not contain vitamin C, 8 mg/100 g of vitamin C is formed after 24 hours when germinated. C, after 2-3 days of germination, its content rises to 12-14 mg/100 g and the content of niacin and usable iron increases by half.

Fruits and vegetables

More than 500 types of fruits and vegetables are registered in the world. Vegetables and fruits are generally characterized by high water content (80-95%), low fat content, small amounts of relatively good quality protein (vegetables 1-2%, dark green leaves 4%), high vitamin and mineral content, some species high fiber. Their volume and low amount of energy helps to reduce the risk of obesity. Epidemiological studies published in the 1980s and 1990s confirmed that populations consuming 400 grams or more of vegetables and fruits per day have a lower risk of cardiovascular disease, certain cancers, and most micronutrient deficiencies. The exact mechanisms of this effect of fruits and vegetables have not yet been sufficiently investigated. One of the risk factors for cardiovascular diseases and cancer is a lack of antioxidants (carotenoids, vitamin E and C). It is likely that the intake of these substances from fruits and vegetables neutralizes free radicals to a degree that minimizes cell damage and the risk of developing chronic diseases. It is also possible that components that are not classified as nutrients (salicylates, carotenoids that are not precursors of vitamin A, lycopene, polyphenols, phytoestrogens) have a protective, as yet insufficiently explored, effect. The minerals potassium, magnesium and calcium contribute to reducing the risk of hypertension. Vitamin C, abundantly present in many types of fruits and vegetables, improves the absorption of non-heme forms of iron contained in legumes, cereals and leafy greens. Fruit contains sugars that can be fermented into acids by bacteria in dental plaque, but fruit is not considered cariogenic. Apples even appear in a number of promotional programs as a symbol of healthy teeth as a food that cleans the teeth after eating with a scrubbing effect, although the evidence for their effect is not convincing. A distinction must be made between fruit and fruit juices. Fruit juices are cariogenic, especially if young children drink them from bottles for a long time.

Liquids

The quantity and quality of drinking water also significantly affects a person's health. Water is an inseparable part of nutrition, and sufficient intake of adequate fluids is part of eating habits. Water makes up about 60% of the total body weight of an adult. Adequate and regular fluid intake is important for proper kidney function. The average daily intake is around 2 l, but more than a third is water in food, and 250-400 ml of water is created in the body through metabolic processes. Adequate fluid intake is especially important for children, who need to be replenished even during their stay at school, and for the elderly, whose sense of thirst is insufficient. Drinking water must meet hygienic requirements. The health significance of consumed drinks is determined not only by their quantity but also by their composition. As with the choice of food, a certain variety is preferred, alternating the types of non-alcoholic beverages consumed. At the same time, a number of drinks represent a very rich supply of energy. Tea is a source of some trace elements (manganese, fluorine). Medicinal effects are attributed to herbal teas. However, drinking exclusively herbal teas can also burden the organism with alkaloids, essential oils, glycosides and other substances with various organ-specific effects. Drinks containing quinine should be limited during pregnancy. Coca-Cola drinks can contain relatively high concentrations of caffeine, which could cause health problems (tachycardia, difficulty falling asleep, stomach pain) especially in children if consumed at a higher level. Some epidemiological studies point to a certain connection between coffee consumption and ovarian or pancreatic tumors, or beer drinking with rectal cancer. However, these relationships have not yet been confirmed. From a nutritional point of view, certain types of beer (yeast beer) are moderate sources of vitamin B12.

Additives

Additives are classified together with contaminants as foreign substances. While contaminants enter the human food chain from the environment, additives are added to food intentionally in order to increase the shelf life of food and extend shelf life (preservatives, antioxidants), to modify their sensory properties - appearance (dyes), taste (flavors, artificial sweeteners), to adjust consistency (thickeners, emulsifiers) and to speed up and adjust technological processes (enzymes). The additives permitted in our country and their maximum permitted content in individual species are limited by the Directive of the Ministry of Health (Hygiene Regulation). The presence of these substances in food is criticized mainly by supporters of alternative nutrition, but in essence they do not represent a significant toxicological burden on humans. In some cases, these are substances that do not naturally occur in the given food, but are among nutrients - for example, E 101 is riboflavin, E 300 is ascorbic acid. The use of each additive goes through an approval procedure, which is preceded by a detailed toxicological examination, including carcinogenicity. The positive list of permitted preparations may not be the same in all states. It is essential that the presence of additives is always declared on the product by stating the name of the substance or the international numerical code E (number). Artificial sweeteners are one of the important groups of additive substances. Artificial sweeteners can be divided into two groups. Non-caloric ones include saccharin, cyclamate, aspartame (a methyl ester of aspartic acid and phenylalanine unsuitable for phenylketonurics) and acesulfame. Non-caloric sweeteners do not affect the formation of dental caries. Caloric sweeteners represent sugar alcohols such as sorbitol, xylitol and maltitol. Xylitol is almost not fermented by dental plaque bacteria, the others are fermented very slowly. Saccharin, which has been used since the end of the last century, was tested in detail in the 1960s for its carcinogenic effects for suspected bladder cancer induction. This monitoring was finally concluded with the fact that saccharin could indeed act as a promoter of the carcinogenic process, but only in doses several orders of magnitude higher than those normally used. In the case of cyclamate, it is interesting that its own toxic intermediate product - cyclohexylamine - is created only in some people by the enzyme activity of the intestinal

Links

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References

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