

Journal of Healthy Nutrition and Dietetics

In issue:



Feijoa



Broccoli



Onion



Cottage cheese



Chicken egg



Rose hip

A detailed description of
the useful, healing and
dangerous properties of
each product



Vitamin F



DASH diet



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Feijoa (lat. *Acca sellowiana*)

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Abstract. The article discusses the main properties of feijoa and its impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of feijoa in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of feijoa on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its application are considered.

Key words: feijoa, benefit, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of feijoa (according to [Food+](#)).

Main substances (g / 100 g):	Fresh feijoa [1]
Water	83.28
Carbohydrates	15.21
Sugar	8.2
Alimentary fiber	6.4
Squirrels	0.71
Fats	0.42
Calories (kcal)	61
Minerals (mg/100 g):	
Potassium	172
Calcium	17
Phosphorus	19
Magnesium	9
Sodium	3
Iron	0.14
Zinc	0.06
Manganese	0.084

Copper	0.036
Vitamins (mg/100 g):	
Vitamin C	32.9
Vitamin PP	0.295
Vitamin E	0.16
Vitamin B6	0.067
Vitamin B2	0.018
Vitamin B1	0.006

Water-soluble iodine is the key ingredient in feijoa. But the estimate of its concentration in different sources varies greatly.

So, according to the TSB, 1 kilogram of fresh berries contains from 15 to 25 "servings" equal to the daily norm of iodine needed by an adult (or from 10 to 20 daily norms of pregnant women, whose need for iodine increases). In absolute numerical terms, the content of this trace element ranges from 2.06 mg to 3.9 mg per kilogram of raw product.

However, in the information tables for this trace element, data are often given in terms of dry matter. And in this expression, according to the research of R.G. Melkadze (2007), carried out using a modified method of Kh.N. Pochinok, in 100 g of feijoa, there are from 8-9 mg to 35 mg of iodine. Such a difference (more than 4 times between the indicators) is due to the territorial remoteness of the plant (or plantation) from the sea (more precisely, from soils rich in iodine). As a rule, the closer to the coast feijoa grows, the higher the iodine content in the fruit.

For example, in the village of Makhinjauri, adjacent to the sea, the iodine content turned out to be maximum (35 mg / 100 g), at a distance of a kilometer from the sea (in the Batumi Botanical Garden) - 22 mg / 100 g, and 10 km from the coast (Ozurgeti) - 12 mg / 100 g. At a distance of 100 km from the sea, the amount of iodine in the fruit was close to the minimum values (8 mg / 100 g), but still large enough to eliminate iodine deficiency when feijoa was included in the daily diet [2]. At the same time, it should be noted that not all soils, even those directly adjacent to the sea, are equally rich in iodine, and vice versa - there can be a lot of iodine in territories that are located far from the coast today, but in the past covered by the ocean.

The authors of the varietal analysis of the chemical composition of the Abkhazian feijoa determined in their study the iodine content in fruits at the level of 0.012-0.0146 mg (12-14.6 µg) / 100 g, although they rated this concentration as high, since iodine content in the berries of other crops does not exceed 0.005 µg/100 g [3].

Despite the fact that “essentially” the data of various studies indicate a sufficiently large amount of iodine in feijoa fruits, there is also a critical opinion on this matter. In particular, Grigory Gerasimov, Doctor of Medical Sciences, professor and WHO expert considers feijoa (just like persimmon and kiwi) a poor source of iodine, calling common ideas about the listed fruits naive and arguing that among plant products only seaweed can accumulate in their tissues a sufficient amount of a valuable element.

Researchers are more unanimous in assessing the potential of feijoa in providing the human body with ascorbic acid. It is believed that 100 grams of vitamin C contains about a third of the daily requirement (about 30-40 mg / 100 g if you need to consume 90 mg of vitamin C for men and 75 mg for women per day). The riper the fruit, the greater the concentration of vitamin C in it. Although significant varietal variations are also possible in this indicator even within the same growing region (for example,

from 44 mg / 100 g for the Allegro variety to 5.23 mg / 100 g for the grade "HCP 0.5"). Fruits from Australian plantations contain much more vitamin C, up to 63 mg/100 g [4].

The same studies found high levels of antioxidant flavonoids, pantothenic acid (0.2 mg/100 g), fiber (6.8 g/100 g) and potassium (255 mg/100 g). Moreover, the edible skin of this fruit contains more flavonoids and vitamin C than the pulp.

Feijoa berries are distinguished by a fairly pronounced acidity (from 1.26% to 2.64%) with a clear predominance of citric acid and a significantly lower amount of malic, tartaric and succinic acids. They have a high content of minerals, exceeding these figures in pears, apples and fruits of most stone fruits. Silicon in 100 g of feijoa fruits contains about 55-60% of the daily norm, boron - 45-50%, chromium and cobalt - 15%, rubidium - 10%. Phytosterols (up to 50%), pectin substances (up to 40%), monosaccharides (with a predominance of glucose) and disaccharides were also found in feijoa.

Medicinal properties

Feijoa is valued not only for its special taste, but also for its medicinal and dietary properties. The fruits of this plant are used to treat thyroid diseases, metabolic problems, and are prescribed when symptoms of atherosclerosis occur. For therapeutic purposes, feijoa is used with a lack of ascorbic acid, as well as with inflammation of the gastrointestinal tract, pancreas, pyelonephritis.

Despite conflicting opinions in assessing the iodine content in feijoa fruits and a real significant difference in indicators for this parameter, depending on the location of the plant, it is believed that when buying berries from regions with iodine-rich soils, you can still get the daily norm of a valuable element by eating 2 to 7 fruits per day.

Iodine is critical for the functioning of the thyroid gland, which controls the body's metabolism. This element also affects cerebral circulation (with iodine deficiency, a violation of cognitive functions occurs). With a lack of iodine in the body of a pregnant woman, a hormonal imbalance occurs, which affects the state of the central nervous system of the developing child, which, ultimately, can lead to mental retardation of the newborn. Symptoms of pathology can also occur in previously healthy people who are faced with chronic iodine deficiency. In addition to the thyroid gland, iodine therapy is necessary for the ovaries, mammary glands, large intestine, gastric mucosa, and skin.

Feijoa can be used as a remedy that can prevent gastrointestinal disorders and restore the digestive system by activating intestinal motility.

This product has anti-inflammatory, immunostimulatory, tonic, anti-sclerotic, antioxidant properties. In particular, the antioxidant effect is created by phenolic compounds of the feijoa peel (caterines, leucoanthocyanins). Thanks to them, the prevention of the development of oncological processes is also ensured. The antifungal activity of feijoa berry essential oil and antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* have been experimentally confirmed.

Vitamin P contained in feijoa helps to lower blood pressure, and pectin in the composition helps to eliminate toxins and free radicals. It also improves peripheral blood supply, preventing cell damage and, as a result, aging of the body.

Use in medicine

In the existing pharmaceutical practice, the possibility of harvesting feijoa leaves as a raw material for medicinal preparations is being considered. And the extracts of the fruits of the plant are already on the market today in the status of dietary supplements and herbal supplements.

So, for example, on sale you can find a vegetable complex of oils in capsules "Women's Health", which contain extracts of feijoa berries, kelp, flax seed oil. The drug is declared as a means to normalize the functioning of the thyroid gland and prevent the development of female diseases.

In folk medicine

Traditionally, the use of feijoa fruits and leaves in folk medicine is wider. Healers use "pineapple grass" (as feijoa is sometimes called) to regulate the functioning of the stomach and intestines (for the treatment of inflammation of the mucous membranes of the large and small intestines), get rid of constipation, treat Graves' disease, gout, atherosclerosis, dermatitis of various nature, pyelonephritis.

The essential oil of the fruit is considered an effective anti-inflammatory agent that can cope with dermatitis and strengthen hair. A decoction of the leaves as an antiseptic and wound healing agent is prescribed for periodontitis, lesions of the oral mucosa and other diseases of the teeth and gums.

Like other iodine-rich foods, traditional medicine recommends feijoa as a prophylactic in the fight against a possible hangover. In addition to other measures that reduce the risk of a hangover syndrome (for example, the use of vitamin B6, glutargin, mezim, succinic acid, choleric drugs, etc.), healers advise including feijoa in the diet 1-2 days before the feast, which should ease the effect of alcohol on the body.

Decoctions and infusions

In folk medicine, mainly decoctions and infusions of feijoa leaves are used, less often - tree bark.

Infusion (tea) from leaves and flowers from urological problems . For one glass (200 ml) of boiling water, you need 1 tablespoon of dried leaves. Tea is prepared for 30 minutes, after which it is drunk half a glass twice a day with the addition of honey. The course lasts 2 weeks.

Leaf decoction for periodontitis . In this recipe, the ingredients are taken in the same proportion (1 tablespoon per 200 ml of water), but the raw materials are boiled over low heat for 20-30 minutes. Apply a decoction in the form of lotions or frequent rinses of the mouth.

A decoction of the bark for healing skin lesions. To prepare a lotion, chopped tree bark (1 cup) is boiled in a liter of water for an hour. Then the mixture is filtered, and the bandages soaked in the broth are applied to the damaged areas of the skin.

in oriental medicine

feijoa was not known outside of South America until the end of the 19th century, there are no ancient Eastern traditions of using this berry for medicinal purposes. However, modern followers of the principles of Chinese and Tibetan medicine, by analogy, include feijoa in various therapeutic programs.

In some works, the fruits of the plant are mentioned as antidepressants, in others - among the foods with hepatoprotective properties (having a positive effect on liver function). Like other acidic feijoa berries, it is recommended to suppress excessive lung energy. But since the abuse of sour food supports the energy of Fire, with its excess, it is not recommended to lean on these fruits.

In scientific research

In search of new ways to combat various diseases, scientists are studying both the pulp of the feijoa fruit and the leaves.

Test-tube experiments on cells have shown that feijoa essential oil can have antioxidant effects and fight free radicals . In addition, it also works as a cytoprotector - it protects lymphocytes from damage and oxidation. There is also preliminary evidence that feijoa essential oil affects *Staphylococcus aureus* (*S. aureus*) and diploid fungus (*C. albicans*) bacteria . The severity of the effect depends on the dose of essential oil [5].

The anti-inflammatory properties of feijoa have been found in extracts from the pulp, skin, and whole fruit . For the study, 4 varieties Appolo , Unique , Opal were used star and Wiki Tu . Experiments were carried out on cells, finding that among the three extracts, the preparation created from the peel was the most effective, and among the varieties, Appolo demonstrated the best results . The researchers claim that feijoa extract has been shown to be more effective than ibuprofen in some cases. From this, scientists concluded that the feijoa fruit can be very useful in the treatment and prevention of inflammatory diseases, especially those associated with the intestines [6].

The scientists tested the effects of phenol-rich feijoa skin and pulp extracts on mercury-affected red blood cells . Mercury can enter the human body even with food, provoking various pathologies: from kidney disease to cardiovascular problems. During the tests, it turned out that the extracts successfully combat mercury toxicity and oxidative stress. In general, the skin extract had a more pronounced protective effect, but the pulp extract showed itself better in some individual parameters. More extensive research is needed to make definitive conclusions about the use of feijoa to combat diseases caused by exposure to mercury [7].

Due to its composition, feijoa leaf extract can function as an Ach inhibitor in the body, slowing down the activity of certain enzymes and at the same time increasing the level of the neurotransmitter acetylcholine . This is necessary for the treatment of dementia with Lewy bodies, Alzheimer's disease, myasthenia gravis, etc. In addition to the standard set of components (proteins, carbohydrates, fats, fiber), the leaf extract contains various phenolic compounds, including flavonols (quercetin glycosides, catechins, procyanidins) [eight].

Feijoa extract obtained with ethanol is effective in the fight against toxoplasma . Toxoplasma is a genus of parasites that cause toxoplasmosis in animals and humans. Cats are especially susceptible to this disease, but sometimes it occurs in humans. Despite the fact that the disease usually proceeds without complications, existing drugs have a number of limitations, so scientists are trying to find new methods of therapy. The results of test-tube studies were confirmed after experiments with mice that were given intra-abdominal injections of parasites. When treated with feijoa extract (100 and 200 mg/kg/day for 5 days), they showed much better survival [9].

Feijoa can be considered an effective natural antidepressant . This conclusion was reached by Iranian scientists who took Swiss albino mice for the experiment. They were subjected to 2 tests (forced immersion test and forced suspension test), the results of which are usually judged on the effectiveness of antidepressants. One group of mice was given the fruit extract, another was given the leaf extract, and a third (control) was given the antidepressant imipramine. By comparing the two extracts and the drug, it turned out that the reaction of mice was better, and the immobility time was shorter in the case of using feijoa extracts. At the same time, the leaf extract was more effective than the fruit extract [10].

Feijoa acetone extract has anti-cancer properties . Feijoa extract acts selectively on infected cells and does not have a toxic effect on normal myeloid precursors. The extract is especially effective in leukemia, and scientists consider flavone to be the main active substance in this process [11].

Weight regulation

Feijoa, with its 50-70 kcal / 100 g, cannot be called a very high-calorie product, but it is rarely made the basis of diets. Most often, the berry is included in the diet as an element of a loose dinner or precedes a meal, since the fiber and pectin in the pulp of the fruit increase intestinal motility and stimulate the digestion process.

In cooking

Due to the pleasant combined taste, which may contain notes of strawberry (strawberry), pineapple, gooseberry, lemon and kiwi, feijoa is eaten mainly fresh, cutting the fruit in half and eating out the jelly-like pulp. However, sometimes "out of childish habit", along with the pulp, they also eat the peel, which gives the berry an astringent bitter taste.

Recently, the "southern" tradition of making preserves and jams from feijoa has spread. To prepare raw jam, it is enough to grind the fruits in a meat grinder (it is possible together with the skin), add sugar at the rate of 600 g per 1 kg of fruit and, after dissolving it, arrange it in sterile jars (containers). Store this jam in the refrigerator, in the freezer. If necessary, they can fill pies.

In addition, soft drinks, wine, tinctures are made from feijoa. So, to create a feijoa aperitif at home, the jar is filled with fruits cut in half (or into 4 slices), sugar is added (2-3 tsp per liter), poured with vodka, tightly closed and shaken. This "shaking" is repeated once a week. The aperitif is infused for 2-3 months in a dark place, after which it is bottled with straining.

Although heat treatment reduces the benefits of feijoa, this does not prevent cooking the famous Georgian churchkhela based on the juice of this berry thickened with flour, which many consider more delicious than the traditional sweetness from grape or pomegranate juice.

In cosmetology

On the basis of feijoa extract, which exhibits anti-inflammatory, antibacterial, antifungal and hemostatic effects, a number of cosmetic preparations are made:

- therapeutic mixtures against psoriasis and for the restoration of the skin,
- antioxidant agents,
- anti-couperose compounds,
- skin tightening, anti-cellulite, toning and tightening serums,
- pastes and rinses for oral care,
- shampoos and conditioners for hair care.

The therapeutic effect that feijoa fruit oil and extract has is used both in home cosmetology and in the beauty industry by manufacturers of skin and hair care products. Creams and shampoos based on feijoa fruit oils are created not only in foreign countries, but also in the post-Soviet countries. Known, for example, body cream "Yuzu and Feijoa" from TM Cafe Mimi (Russia), serum-cocktail for hair "Litchi-Feijoa" from Estel Professional Mohito (Russia), cream-shower gel with flower oils "Feijoa and mint » from Vitex (Belarus) and others.

The severity of the therapeutic effect depends on the concentration of the feijoa extract, and in the manufacture of cosmetics at home, it varies from 2% in shower gels, lotions and light creams, to 30% in concentrated serums. So, for example, antiseptic formulations and anti-couperose agents usually contain from 5 to 15% of the extract, moisturizers - 8-10%, creams and ointments with a therapeutic

effect - 3-10%, etc. To maintain the effect, feijoa extract is introduced into the composition of the final product at a temperature not exceeding 40 C. The pH level of this ingredient is about 4.7-4.9.

As an example of making homemade cosmetics with feijoa, we can give a recipe for a mask for oily skin: the pulp of a berry (1/2 cup) ground into gruel is mixed with lemon juice (1 tablespoon) and camphor alcohol (1 tablespoon), applied on the face and after 15 minutes it is washed off with warm water. To get the result, it is enough to make such a mask twice a week.

Dangerous properties and contraindications

It is believed that the systematic abuse of feijoa can be harmful due to the high content of iodine in it, which is not indicated with an increase in the concentration of hormones T4 and T3 (with thyrotoxicosis) and adenoma (autonomous thyroid gland nodes). But the risk of overdose is minimal, since the inhabitants of our country (as an iodine-deficient region) are at great risk of deficiency of this element.

Feijoa berries can also harm people who are overweight and have diabetes. You should not eat unripe fruits. This can lead to digestive upset. Also, in order to avoid frustration, you should not eat pectin-containing feijoa fruits along with milk.

Selection and storage

When choosing feijoa, they are guided, first of all, by the elasticity of the berry and its appearance. Fruits should be chosen without darkening, black blotches and stripes. If you want to immediately pick up more ripe fruits, then before buying, you should determine their rigidity by pressing: very hard berries have not yet ripened and they will have to be ripened at home.

If it is possible to see a sample of the presented batch of feijoa in a section before buying, then you can focus on the color of the pulp, which for ripe berries will be creamy at the edges, and closer to the center - almost transparent, jelly-like consistency. The brown color of the pulp and darkening on it indicate the beginning of the processes of decay and the need to reject such a product, and the white pulp indicates the immaturity of the fruit.

Feijoa storage is an acute problem, since the season of this berry lasts from September (when it is still very expensive) until the end of January (when it is already very expensive). Moreover, the first batches are still completely immature fruits that would ripen on a tree only by the end of autumn and the beginning of winter.

Feijoa is often referred to as a "capricious" berry, due to the fact that it does not tolerate storage well. However, this applies to a greater extent to already ripened fruits, which are not even recommended to be kept in the refrigerator for more than a week - they begin to darken and wither. Therefore, for transportation, feijoa is still unripe with dense white flesh. But feijoa ripens easily at home, if you just leave the fruits at room temperature (+ 23-25C) in a well-ventilated place. At lower temperatures, the ripening time increases. At a temperature of about 10 C, this process takes about 7-10 days.

The exact parameters of keeping quality of fruits depend on the variety of feijoa. So, for example, it was experimentally found that at a temperature of 0-2 C and a humidity of 85%, the "hardy" variety Sidling after 20 days of storage "loses" only 5% of the fruits (they begin to rot and blacken). The remaining berries retain a smooth skin without dents and damage to the pulp. In varieties with low keeping quality, the rejection rate for the same period is about 20-30%. On average, for three weeks of proper storage in the refrigerator, you can miss about 10-15% of the stock. Experts do not recommend

freezing feijoa. It is believed that the thawed berry changes its physical and technical properties and can only be used for processing into sauces.

The chemical composition also changes unevenly during storage. But when creating conditions for a controlled atmosphere (with 3% CO₂ and the same amount of O₂), in 2/3 of the fruits of the varieties Sidling, Superba, Allegro, etc., it is possible to maintain a chemical composition close to the original values, although even in this case it was observed decrease in the content of ascorbic acid.

How to grow feijoa from seeds at home

Although under natural favorable conditions this plant reaches a height of 4-6 meters, in rooms and on loggias feijoa usually grows no more than 1-2 meters. The decorative effect is enhanced by a well-formed crown, decorated with four-membered white-pink flowers with many scarlet stamens, which appear on the branches by mid-late spring as early as 3 years after planting.

Since feijoa is a photophilous plant, to simplify its care, it is better to sow by the end of winter with increasing daylight hours - then additional illumination is not required.

Seeds. For growing feijoa from seeds, ripe soft fruits are chosen (if necessary, they are ripened in a well-ventilated, warm and bright place). The fruit is cut, and the seeds are separated from the pulp by spreading it over a dense tissue, followed by rinsing under running water. When the cloth dries along with the seeds, they can be poured into a pot.

Sowing. The soil for feijoa seeds should consist of a mixture of turf and sand in equal proportions. Often, turf, sand and humus are taken in equal proportions. Drainage (expanded clay or sand) is laid out at the bottom of the pot. Seeds are not buried, but evenly distributed over the surface of the soil and slightly pressed, but taking into account the fact that light must fall on them for germination. Sometimes, to facilitate sowing, the seeds are pre-mixed with sand, which is then scattered over the surface of the pot. The soil is moistened from the sprayer with a pinkish solution of potassium permanganate.

Germination. Moistened soil is covered with a transparent film or glass jar, and the pot is set in warmth and light. The top layer of the soil must be kept moist until sprouts appear (after about 2-4 weeks). At the same time, it should be ventilated daily, and condensate should be removed from the inner walls of the "greenhouse". Shoots after the appearance will have to be thinned out, pulling out all the weakened and unviable.

Pick. Feijoa seating in separate small pots is carried out during the formation of plants from 2 to 4 pairs of true leaves. To do this, take 6 shares of sod land, 4 shares of leaf humus, and one share of coarse sand and manure fertilizer. Sprouts require regular watering through a sump and daily misting with a sprayer during periods when the air in the room is too dry. Top dressing during active growth is carried out with organic and / or mineral fertilizers once every 2 weeks.

Transplant and pruning. For the first three years, feijoa is transplanted three times, then once every two years, and old bushes are transplanted no more than once every 5 years. This should be done carefully so as not to damage the fragile root system. To form a crown, all shoots and shoots are regularly removed from the lower quarter of the trunk. Do this if necessary, either in early spring or late autumn.

In general, feijoa is considered an unpretentious plant, which from spring to autumn may well be spent on an unshaded balcony or garden. Most of the flowers will not give an ovary, but this is the

specificity of the plant itself, and not the care of it - the coefficient of useful ovary in feijoa is at the level of about 15%.

Despite this, even a small harvest will delight with rare and tasty fruits, which, with proper care, will be able to provide the amateur gardener with useful vitamins and trace elements, especially if their content in the soil is adjusted with timely top dressing.

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Feijoa - useful properties, composition and contraindications

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Broccoli (Brassica oleracea Broccoli Group)

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Abstract. The article discusses the main properties of broccoli and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of broccoli in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of broccoli on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its application are considered.

Key words: broccoli, benefits, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of broccoli (according to [Food+](#)).

Main substances (g/100 g):	Fresh Broccoli [1]	Frozen broccoli [2]	Boiled broccoli [3]
Water	89.3	91 , 46	88.68
Carbohydrates	6.64	4.78	7.13
Squirrels	2.82	2.81	2.37
Alimentary fiber	2.6	3	3.3
Sugar	1.7	1.35	1.38
Fats	0.37	0.29	0.41
Calories (kcal)	34	26	35
Minerals (mg/100 g):			
Potassium	316	212	291
Phosphorus	66	fifty	67
Calcium	47	56	40
Sodium	33	24	288
Magnesium	21	eighteen	21
Iron	0.73	0.81	0.67
Zinc	0.41	0.48	0.45
Manganese	0.21	0.294	
Copper	0.049	0.038	0.061
Vitamins (mg/100 g):			
Vitamin C	89.2	56.4	64.5
Vitamin E	0.78	1.22	1.44
Vitamin PP	0.639	0.47	0.549
Vitamin B6	0.175	0.13	0.199
Vitamin B2	0.117	0.096	0.122
Vitamin B1	0.071	0.053	0.063

Of the minerals, macro- and microelements presented in the table, it should be noted potassium, which removes water and excess salts from tissues, phosphorus and calcium, which ensure the strength of bone and the functionality of brain tissue; iron and copper involved in the processes of hematopoiesis. There is iodine in broccoli that is not included in the table, which is necessary for the normal functioning of the thyroid gland.

Among the vitamins in broccoli, a special place is occupied by vitamin K (about 140-150 mcg / 100 g, which is 15-20% higher than the daily norm for an adult) and vitamin C, according to the content of which per 100 g asparagus cabbage, even boiled and frozen easily outperforms almost all citrus fruits. Moreover, in broccoli, vitamin C is presented in the form of ascorbigen, a precursor of ascorbic acid, which is almost not lost during storage. A lot in broccoli and the precursor of vitamin A - carotene. According to this indicator, asparagus cabbage "loses" only carrots, and favorably stands out against the background of cauliflower, where there is very little carotene. There is also a certain amount of Omega-3 (about 0.12 g / 100 g) and Omega-6 (0.05 g / 100 g) in this vegetable.

Broccoli contains more protein than potatoes, sweet potatoes, sweet corn and spinach.

In terms of the content of various essential amino acids (lysine, leucine, isoleucine, methionine, valine, etc.), presented in the protein of asparagus, it competes with beef, and in terms of the content of tryptophan, isoleucine and lysine, it competes with egg white.

It is also important that, unlike all other types of cabbage, the protein of which contains purine substances that are deposited in the form of uric acid in the kidneys and exacerbate gout, there are few purine substances in broccoli (compared to cauliflower, almost 4 times less), which significantly reduces the risk of stone formation.

The benefits of broccoli don't stop there. A number of compounds found in asparagus have pronounced medicinal properties. Let us consider their significance in therapeutic practice in more detail.

Medicinal properties

Broccoli sprouts (as well as cauliflower sprouts) contain a record amount of glucoraphanin, a precursor of an organic compound called sulforaphane, which prevents certain types of cancer [4] and has antibacterial properties [5]. In order for glucoraphanin to be transformed into protective sulforaphane, it is enough to simply chew the cabbage (and not swallow it in large pieces) or cut it, because with such a mechanical action, the plant catalyst, the myrosinase enzyme, is activated. Heat treatment at high temperatures destroys both myrosinase and glucosinolates, but if you do not boil, but only steam the asparagus, the benefits can be fully preserved.

With the help of asparagus cabbage extracts, scientists expect to suppress the development of the herpes virus. The first subtype of the hsv-1 virus (which infects more than half of humanity) manifests itself mainly as a rash on the lips, neck, around the eyes, affects the central nervous system, but there is also evidence that it may be associated with the development of Alzheimer's disease and genital cancer. Another subtype (hsv-2) is reliably capable of dangerously affecting the genitals, and it lives in about every 8-10 adults on the planet. Since the rate and extent of the spread of the virus depend on the work of genes regulated by the NRF2 protein, stimulation of the activity of the protein can slow down the spread of the viral infection [6]. In this regard, broccoli extracts are considered as potential protein activators and, accordingly, as an effective tool in the fight against herpes simplex virus of both subtypes.

The therapeutic effect of sulforaphane has been investigated in the treatment of prostate cancer. During the experiments, the substance selectively suppressed the growth of cancer cells (by restoring the reduced activity of the PTEN gene), without affecting healthy cells. Work is underway to study the ability of sulforaphane to treat cancer of the colon, stomach, pancreas, and lungs.

Sulforaphane is also known as a substance used in rehabilitation programs for stroke patients. More recently, highly concentrated sulforaphane-rich broccoli extracts have been seen as an effective treatment for type 2 diabetes (or at least diabetic kidney and vision problems). In antidiabetic therapy, such extracts can complement metformin treatment, and sulforaphane (unlike metformin) is safe for the kidneys.

In matters of diabetes therapy, we are talking about concentrated extracts, the daily dose of sulforaphane in which is equivalent to a dose of 5 kg of mature asparagus. However, the preventive and curative effect of broccoli can be significantly enhanced if sprouted seeds of this cabbage (3-day-old sprouts) are eaten, since they contain 10–100 times more glucoraphanin than already ripened vegetables [7]. As a result, seedlings are better protected against carcinogenesis, mutagenesis, and other forms of electrophile and reactive oxygen species toxicity. At the same time, valuable glucoraphanin is also preserved in mature cabbage, and in the relatively recently bred Beneforte variety, it is three times more than in other varieties.

In addition to glucoraphanin, broccoli glucosinolates contain goitrin and its inactive form, progoitrin. In the event of a lack of iodine in the body, goitrin can slow down the development of goiter by

increasing the secretory activity of the thyroid gland. But there is much more progoitrin in broccoli than goitrin, and in order for it to go into an active form, enzymes are needed, and they are destroyed during heat treatment. Therefore, to preserve the benefits, it is preferable to cook asparagus cabbage at a temperature not exceeding 50-60 C.

From cruciferous plants in general and from asparagus in particular, the compound 3,3'-Diindolylmethane, known as DIM, has been obtained, which, due to its antitumor potential, is regarded as a tool for combating various types of cancer, but not only. DIM can mitigate the effects of radiation therapy (for example, in the treatment of cancer) and protect healthy cells from intense gamma radiation.

DIM is also being studied as a treatment for a rare relapsing disease caused by the human papillomavirus - papillomatosis, characterized by inflammation of the upper respiratory tract [8].

Another compound called Indole-3-Carbinol in asparagus activates the body's detoxification system, which, among other things, can slow down the aging process.

Phenolic compounds that accumulate in broccoli can have a choleric, diuretic, and laxative effect. They can lower blood pressure, fight bacteria, and suppress inflammation. Due to this, regular consumption of broccoli can potentially reduce the risk of coronary heart disease, asthma, and type 2 diabetes. By crossing different varieties of broccoli, geneticists strive to obtain the most useful asparagus with an increased amount of phenolic compounds, but now known varieties are also characterized by a high content of useful flavonoids [9].

Use in medicine

Since the end of the 20th century, preparations have been produced in a number of countries that include biologically active substances isolated from asparagus cabbage. A partial list of dietary supplements and drugs with raw materials obtained from broccoli is presented below:

- *Grapine by Nature's Sunshine Products, Inc.* American drug is used 1 tablet per day to strengthen the walls of blood vessels and improve blood circulation. Grapine is listed as an antioxidant.
- *Mastofit from Evlar.* The Russian drug is recommended for long-term (from 2 months) administration in diffuse and/or fibrocystic mastopathy, reproductive disorders in women, uterine fibroids, and premenstrual syndrome.
- *Ikvalin from Enrich International Inc.* . Another drug from the USA with broccoli concentrate that reduces the risk of inflammation and ulcerative processes in the gastrointestinal tract.
- *Rose ox by D&F Industries.* dietary supplement with claimed antioxidant effect.
- *Broccoli Seed Extract by Solaray.* Dietary supplement in capsules with an extract activated by myrosinase. Designed for detoxification and prevention of cancer, aging, osteoporosis.
- *30% glucoraphanin (Wisepowder)* . Wisepowder releases purified 30% glucoraphanin powder, presenting it as a weight loss agent and reducing the negative symptoms of obesity, an antioxidant, as a drug for the prevention of cancer, cardiovascular diseases, and as a substance alleviating the symptoms of autism and diabetes 2- type.

In folk medicine

The range of uses of broccoli in traditional medicine is very wide. With the help of asparagus cabbage they treat:

- peptic ulcers of the duodenum and stomach (pain, vomiting, nausea are relieved),
- flatulence, dysbacteriosis and digestive disorders (dispersion),
- liver disease, inflammation of the bile ducts,
- type 2 diabetes (with obesity),
- diseases of the heart and blood vessels by eliminating cholesterol deposits,
- sunburn, cuts and skin diseases,
- insomnia
- eye diseases (clouding of the lens, senile macular degeneration).

The traditional use in folk medicine of freshly squeezed broccoli juice to fight infectious diseases has recently received experimental confirmation: it was found that such juice is able to suppress the bacteria *Staphylococcus aureus* and tuberculosis. The folk experience of using broccoli shows high efficiency in suppressing *Helicobacter pylori* infection, including those forms of bacteria that are resistant to antibiotics.

Decoctions, infusions and drinks

In folk medicine, a recipe for a very simple broccoli broth is known, where cabbage and water are taken in an approximate ratio of 100 g of vegetable / 300 ml of water, and the cooking time is 5 minutes. Sometimes such a decoction is prescribed for the treatment of prostatitis in the mode "1.5 months of continuous intake - a month of break - a month of admission." But the expediency of using decoctions of asparagus cabbage is a moot point even among fans of folk methods of treatment due to the formation of amino derivatives of purine (guanine and adenine) during cooking broccoli.

More common in folk medicine are infusions with broccoli juice in the composition, intended for the prevention of cardiovascular diseases, as well as an infusion of broccoli seeds to combat helminths.

On the seeds of asparagus cabbage, the infusion is prepared as follows: 1 tbsp. l. seeds are poured with 250 ml of boiling water and infused for 30 minutes until cool. The liquid is then filtered and either divided into two portions for taking in the morning and evening, or drunk at a time.

For the treatment of cardiovascular diseases, you can prepare the following drinks based on broccoli juice with additional ingredients:

Chokeberry (50 g of fruits) is infused in boiling water (250 ml) for 20 minutes, then the infusion is filtered, cooled and mixed with asparagus juice (120 ml). This portion should be drunk during the day, and the entire course lasts one and a half to two weeks.

, which include coltsfoot leaves (10 g), birch leaves (5 g), dried licorice root (5 g), flax seeds (10 g), are crushed in a mortar, poured with boiling water (200 ml) and, after cooling, mixed with broccoli juice (200 ml). The resulting drink should be drunk throughout the day. The duration of the course is 1-1.5 weeks.

Valerian roots (7 g) are crushed and poured with boiling water (250 ml) for half an hour, after which the liquid is filtered and mixed with cabbage juice (200 ml). Within a week, the drug is taken 30 ml twice a day.

in oriental medicine

Dr. Yanbum Gyal, describing the traditions of using herbal products in Tibetan medicine, said about broccoli (also known as tyope-cel, pulgebi, bekor-pecel, label-nyotsel, etc.) that it is a sweet and salty, slightly cool product. :

- treats inflammation
- gets rid of parasites
- provides prevention of diabetes and oncological diseases,
- thins the blood
- increases the seven components of the body,
- enhances digestion heat, while contraindicated in cold and phlegm diseases.

Some modern sources state that raw broccoli should be avoided in Mucus disorders, but when cooked, it can be included in the diet in certain cases. Some of these authors, based on ancient traditions, recommend using broccoli (and other foods in the diet containing vitamins A and C) to prevent demodicosis, a skin disease caused by a parasitic mite.

Following the principles of clinical nutrition , current Chinese medicine practitioners

broccoli is introduced into the number of "unloading" spring products to improve liver function. Cabbage is advised to eat boiled with the addition of a small amount of lime (lemon).

In scientific research

Scientists in their projects are exploring the possibility of creating drugs from broccoli for diabetes, cancer, cardiovascular disease, and even schizophrenia.

Asparagus extract has been shown to be safe in the treatment of type 2 diabetes.

The highly concentrated drug was tested for three months in an experiment involving 97 diabetic patients. In addition, all participants in the experiment had problems with being overweight. Supplementation of broccoli extracts in the experimental group taking high concentrations of cabbage-derived sulforaphane resulted in a 10% reduction in glucose levels compared to the control group. Despite the seemingly insignificant difference in results, according to project leader Anders Rosengren, this may be enough to save patients from associated kidney and vision problems [10].

Regular consumption of broccoli reduces the risk of prostate cancer even in the presence of genetic preconditions for it.

Since the pathological changes leading to prostate cancer are associated with the loss and loss of activity of the PTEN gene, scientists have studied the possibility of correcting the gene defect using sulforaphane isolated from broccoli. The substance was tested first on a cell culture of human prostate cancer, then on laboratory rodents and, in the final stage of the project, on humans.

In the second phase of the experiment, some PTEN-deleted mice were given regular food, while others were given sulforaphane-enriched food. In the first group, a complex genetic disorder occurred due to the inoperability of PTEN, and in the second group, sulforaphane corrected the defect so that there was no statistically significant difference with healthy mice from the third control group.

Testing in humans occurred by including in the diet of patients in the precancerous stage of the investigated products. Representatives of one group during the year were supposed to eat 400 grams of green peas weekly, while others - 400 grams of broccoli. Both diets affected dozens of genes, but the "cabbage" diet had an effect more similar to that of sulforaphane in mice in the second stage of the experiment [11].

Sulforaphane-rich broccoli extract and zinc activate metallothionein and Nrf2, respectively, protecting the body from cardiomyopathy (dysfunction of the heart muscle) .

In the 8-week experiment, mice were divided into 4 groups and all were subjected to intermittent hypoxia. The first group was not treated with anything, the second was given zinc, the third was given broccoli extract, and the fourth was given broccoli extract and zinc at the same time. The heart was then examined for pathological changes, fibrosis, inflammation, and oxidative damage. In those animals that were not treated with anything, cardiac dysfunction was clearly observed. With monotherapy, the changes were not so significant, and with combination therapy (extract and zinc), the best results were recorded [12].

Broccoli extract is likely to be used in the treatment of schizophrenia in the future.

Such expectations among scientists appeared after conducting three interconnected studies.

At the first stage, scientists found that compared with healthy people, patients with symptoms of schizophrenia have a different metabolism in the brain. They have been found to have 4% lower levels of glutamate (one of the most important neurotransmitters) and are also deficient (3% and 8% in different parts of the brain) of glutathione (of which glutamate is a part) [13].

In the second phase, the researchers tried using the drug to change the balance of glutamate in the brains of laboratory rats. They blocked an enzyme that is needed to convert glutamate to a constituent of glutathione. The release of glutamate increased the number of signals the brain cells sent out, but this was similar to what is typical in schizophrenia. Then they used sulforaphane, extracted from broccoli, to increase the amount of glutamate converted to glutathione. Brain cells began to send fewer signals, and it was more like healthy brain activity [14].

The third stage is human testing. 9 healthy volunteers took 2 capsules of 100 μ mol sulforaphane in the form of broccoli extract daily for a week. Such an extract on an empty stomach may cause upset or gas, but is generally well tolerated. As a result, it was noted that the level of glutathione increased by 30% in the subjects [15]. And although the study is not completed (it is necessary to determine the optimal doses and find out how long you need to take the extract for the desired effect to appear), the results were rated as encouraging.

Weight regulation

Contained in 100 grams of broccoli 30-35 kcal by themselves make asparagus a dietary product. But besides this, two more characteristics help broccoli to become a very effective product for weight loss:

Abundance of fiber . In broccoli, it is about 2.6 g / 100 g, which corresponds to approximately 9-10% of the daily requirement. Although asparagus cabbage is not a champion in this indicator, but, for example, Beijing cabbage, cauliflower, red and white cabbage, it is ahead. Dietary fiber is not processed by digestive enzymes, but fills the gastrointestinal tract, serves as an object for processing microflora, and improves the motor function of the intestine. In general, this creates an effect that is called "negative calorie" - a ratio in which the body takes more energy to digest and utilize the product than it receives from this product during meals.

The presence of tartronic acid . Contained in asparagus cabbage, tartronic acid inhibits the transformation of carbohydrates into fat and cholesterol deposits, inhibiting further weight gain and obesity in overweight people.

Today, two diets with broccoli are most widely used: a hard 3-day diet and a "soft" 10-day diet. The three-day one combines two types of cabbage: asparagus and cauliflower. In total, you need to eat 1.5

kg of vegetables daily with the possible addition of mild spices and lemon juice. Unsweetened tea and still water are also acceptable.

The 10-day diet is much more varied and easier to tolerate:

1-2 day. For breakfast and dinner - 200 g of broccoli with tea. For lunch - chicken broth, chicken cutlets (150 g) and cabbage (100 g).

3-4 day. For breakfast and dinner - stewed broccoli with butter (200 g), bell pepper (1 pc.) And mineral water. For lunch - broccoli stew (150 g), tomatoes (2 pcs.), Onions and fruit juice.

5-6 day. Breakfast - cabbage (100 g) in sour cream, beef stew (100 g), yogurt. Lunch - steamed asparagus cabbage (200 g) with tea. Dinner - boiled beef (150 g) with mineral water.

7-8 day. Breakfast - steamed broccoli (200 g) with boiled hard-boiled eggs (2 pcs.) And fruit juice. Lunch - chicken broth (200 ml) and blanched broccoli (100 g). Dinner - asparagus cabbage (100 g), rye bread (70 g), tomato juice.

9-10 day. For breakfast and dinner - blanched broccoli (100 g), baked potatoes (100 g), tomato juice. For lunch - boiled cabbage (100 g), low-fat fish (100 g), tea.

In cooking

The use of double boilers and multicookers in the process of cooking broccoli is due to the desire to preserve the maximum amount of nutrients. Chinese scientists even conducted a special study, studying the effect of five different methods of cooking broccoli on the safety of beneficial compounds. Among the methods tested are: microwave cooking, boiling (boiling), frying, frying with boiling, steaming. As a result of any cooking method, except for steam treatment, significant losses of vitamin C, soluble proteins and sugars, chlorophyll were recorded, in addition, glucosinolates underwent significant changes [16].

However, it is difficult to single out a single cooking algorithm as a priority. So, for example, glucosinolates are better preserved with a one-minute steaming and begin to be lost already with a two-minute one. The overall antioxidant capacity remains high even after 5-10 minutes of steaming. In some cases, it is more appropriate to use a microwave oven. And although frying the product is the worst way to cook it if you want to preserve the maximum benefit, the further choice depends on the specific tasks of nutritionists.

While broccoli can also be eaten raw, the most popular method of eating it is cooking is still boiled and roasted (or a combination of these types of processing). An example of such a culinary approach is a salad with asparagus in oyster sauce.

Broccoli (1 small head) is divided into inflorescences and each additionally cut in half. Carrots (1 pc.) are chopped into strips. Sliced vegetables are added to the oil heated in a frying pan and fried with stirring for one to two minutes. Then sugar (1 tsp), oyster sauce (5 tbsp) and water (50 ml) are added. Stew this mixture for about 3 minutes, after which it is served with cashew nuts.

You can also quickly cook broccoli with shrimp, tomatoes, cheese, mushrooms and eggs. Soups, casseroles, frittata are made from this cabbage - a traditional Mediterranean omelet stuffed with vegetables, cheese, sausages, etc. Broccoli goes well with meat dishes, potatoes, pasta.

In cosmetology

Separately, dry broccoli extract (at a concentration of 0.5% to 10%) can now be purchased to create cosmetics at home with various functions:

- rejuvenation - due to the action of antioxidants and regenerating substances that can restore epidermal cells,
- even tone and light whitening,
- moisture,
- relieve inflammation,
- cellular UV protection, activated by the action of sulforaphane.

Asparagus seed oil, obtained by cold pressing, is used in acne treatments, in skin care products for oily skin (because it reduces sebum secretion), in lip products, and nourishing balms. Also, seed oil is recommended in the care of brittle and dry hair, which, due to the action of erucic acid from the Omega-9 family, allows the hair to shine without making it heavy and “dirty”. After such oil, there is no feeling of greasiness. Therefore, it is not surprising that broccoli seed oil is often added to shampoos, rinses, and hair styling products.

Dangerous properties and contraindications

Broccoli has few contraindications, and the side effects that can occur when the product is abused are usually temporary. These include gas formation and irritation of the walls of the large intestine with vegetable fiber.

However, people with high stomach acid, patients with pancreatic disease, and those taking anti-clotting drugs should limit their consumption of broccoli. The latter is explained by the fact that vitamin K contained in the vegetable can affect the effectiveness of drugs.

In addition, the use of broccoli is recommended to be limited to people with hypothyroidism - an endocrine disease associated with insufficient production of triiodothyronine and thyroxine by the thyroid gland, which leads to disruption and slowing down of metabolic processes.

Selection and storage

When choosing broccoli, you should focus on the color and density of the plant. Ripe buds of classic asparagus will be a rich green color (with some varietal variations in green from purple to sage). The pale color of the cabbage indicates that it has not yet ripened. Yellowed buds indicate that the cabbage is overripe and should be discarded. Also, a sign of overripe broccoli can be small yellow buds on the head of the vegetable.

Dark green cultivars with a purple hue are thought to have more beta-carotene than lighter colored vegetables, and smaller buds (10-15 cm in diameter) are said to have more sweetness. A dense, but not stiff, stalk without mucous formations and a rounded head with a close fit of inflorescences up to 15-20 cm in size are a sign of a quality product.

The most delicious is autumn and winter broccoli. Cabbage harvested in spring, summer and early autumn has a less pronounced taste and juiciness. For the sake of preserving sunlight-sensitive vitamins, it is better to choose vegetables from the back of the box.

Before use, purchased cabbage should not just be washed under running water (which can be done, for example, with your garden broccoli), but it is recommended to leave it in the water with the cutting up for half an hour in order to more likely get rid of nitrate traces.

Before storing in the refrigerator (in the compartment with a temperature of 1-3 C) for several days (up to a week), it is not recommended to wash broccoli, because water can provoke the onset of rotting processes. But to preserve for a long period, such a method of freezing is practiced, in which the cabbage is cut into inflorescences and stems, blanched in boiling water for 3-5 minutes (the vegetable is immediately placed in boiling water), after which it is abruptly transferred to ice water. When broccoli cools, it is dried, laid out in containers and frozen (in this form, cabbage is easily stored for six months or a year).

It is believed that keeping broccoli in boiling water for about 3-5 minutes still makes it possible to retain a sufficient amount of flavonoids, carotenoids lutein and beta-carotene, although, for example, temperature-sensitive vitamin B1 will begin to quickly break down. Chlorophyll in such a procedure will help save the addition of salt to boiling water.

Vitamins C, B2, B6, E are easily lost when the vegetable is stored in the light. Also, the content of vitamins decreases rapidly in chopped vegetables. Therefore, for a long time, cabbage is most often frozen in closed containers with large inflorescences. However, it must be taken into account that freezing broccoli reduces the activity of the myrosinase enzyme by 10 times, due to which glucoraphanin is transformed into valuable sulforaphane. Therefore, methods for enriching frozen asparagus with myrosinase are being developed today.

Varieties and cultivation

There are about 200 varieties of broccoli in the world, but only a small part of the varieties and hybrids are cultivated in our country, although the climate for growing asparagus is favorable in a large area of the country. Broccoli grows well in moist areas on deep clay soils and at a temperature of 18-23 C. Under good conditions, the crop can be harvested several times a year - including in winter (which is considered one of the features that distinguish broccoli from related Calabrese and Romanesco).

The classic type of broccoli is a plant with a height of 50 cm to 0.9-1 meter, a powerful stem which ends in a densely folded inflorescence-"head", usually green. Depending on the variety (hybrid), there may be color variations of shades: light green (Caesar, Koros F 1), blue-green (Naxos F 1, Karato F 1), gray-green (Curly head, Agassi F 1), etc. But there is also asparagus of non-classical species, broccoli with white and purple (violet) flowers.

New hybrid plants are being created on the basis of broccoli. In particular, since 1985, the Japanese company Sakata Seed Company has been developing a hybrid of Chinese cabbage Gailan and broccoli for 8 years, which was registered under the trademark "Broccolini". With its thin, edible stem, the plant resembles asparagus, and its head resembles broccoli. Broccolini is similar in taste to both parent cultures at the same time, but differs in a sweetish aftertaste.

Often, another cultivated cabbage variety, Romanesco, is called a hybrid of broccoli and cauliflower - a plant with a mathematically beautiful inflorescence that forms a logarithmic spiral. In terms of the content of some vitamins, this cabbage even surpasses broccoli, but in general, the classic asparagus cabbage is so healthy that it is difficult for it to compete.

Since regular consumption of broccoli can help treat a variety of diseases (from diabetes and gastrointestinal problems to cardiovascular and oncological diseases), the fact that this product is available almost all year round can be considered a great success, so do not neglect the opportunity to make broccoli a part of daily diet.

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Broccoli - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of broccoli and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of broccoli in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of broccoli on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With her application .



Onion onion (lat . *Állium cépa*)

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Abstract. The article discusses the main properties of onions and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of onions in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of onions on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Key words: onion, benefit, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of onion (according to [Food+](#)).

Main substances (g / 100 g):	Onion [1]	Green onion [2]
Water	89.11	92.32
Carbohydrates	9.34	5.74
Squirrels	1.1	0.97
Alimentary fiber	1.7	1.8
Sugar	4.24	3.91
Fats	0.1	0.47
Calories (kcal)	40	27
Minerals (mg/100 g):		
Potassium	146	159
Phosphorus	29	25
Calcium	23	52
Sodium	four	fifteen
Magnesium	ten	16
Iron	0.21	0.51
Zinc	0.17	0.2
Manganese	0.129	0.15
Copper	0.039	0.031
Vitamins (mg/100 g):		
Vitamin C	7.4	13.4
Vitamin B6	0.12	0.088
Vitamin PP	0.116	0.33
Vitamin B1	0.046	0.03
Vitamin B2	0.027	0.026
Vitamin E	0.02	0.21

This table shows the chemical content of onions in comparison with their content in green onions. Comparison shows that with the general similarity of products, there are noticeable differences in some positions: for vitamin B6 - by 35-40%, for vitamin C - almost 2 times, for nicotinic acid (PP) - almost 3 times, and for vitamin E - 10 times. Onions and green onions differ (in favor of the latter) also in the content of sodium (4 times), calcium and iron (more than 2 times). However, even with its "arsenal" onions have a huge healing potential.

Onions are considered an excellent source of biotin (vitamin B7) and a relatively good source of vitamins B6, C, B1, folate (B9), copper manganese, phosphorus, potassium, and dietary fiber. A rich concentration of flavonoid polyphenols was found in onions. Lots of quercetin. Also, this vegetable crop contains a wide variety of allyl sulfides, including the four main diallyl sulfides (DMS, DDS, DTS, and DTTS), various sulfoxides. All this set determines the medicinal properties of onions.

Medicinal properties

The impact of onions on humans is very diverse, although the degree of severity of therapeutic effects is not always equally high. It is usually customary to talk about the following types of onion effects on the body:

- antimicrobial,
- antiparasitic (antihelminthic),
- antiscorbutic,
- wound healing,
- painkiller,
- anti-inflammatory,
- anti-sclerotic,
- antidiabetic,
- tuberculosis,
- antitumor.

The fact that phytoncides of onions and some other plants have a detrimental effect on bacteria - the causative agents of diphtheria, dysentery, tuberculosis, streptococci, as well as yeast fungi, was established back in the first half of the last century. Modern research shows new facets of using the medicinal properties of onions.

Thus, it is considered promising to develop and use onion preparations to improve the functioning of the heart muscle, smooth muscles, and secretory glands of the digestive system. There is also statistical evidence that the systematic use of onions in food can reduce the risk of certain cancers (breast cancer, bowel cancer).

Improves onions and brain function. It is assumed that sulfur compounds, entering the brain with blood, stimulate the performance of neurons, and also prevent damage to healthy cells. Red onions are especially rich in anti-inflammatory phytonutrients (such as quercetin). However, there are quite a lot of these substances in both white and yellow onions. There are conflicting data on the therapeutic properties of quercetin, but some studies suggest that quercetin stimulates mitochondrial biogenesis, which leads to an increase in the number of mitochondria in brain cells after traumatic brain injury [3]. Quercetin is also thought to be able to prevent spinal cord degeneration.

Fresh onion has an antithrombotic effect, but scientists have found that heat treatment deprives it of this property. In the experiment, quartered onions were steamed for 1, 3, 6, 10 and 15 minutes, and then its effect on the blood of 12 volunteers was tested. The antithrombotic effect disappeared between 3 and 6 minutes of steam exposure, and after 10 minutes, on the contrary, onion began to stimulate platelet activity [4]. At the same time, fresh and thermally untreated onions really thin the blood, prevent platelets from sticking together, normalize triglycerides and cholesterol, preventing the formation of atherosclerotic plaques, and improve the function of cell membranes in erythrocytes.

There are promising studies on the effects of fresh onions on the bacteria *Streptococcus sobrinus* and *Streptococcus mutans* (which lead to tooth damage), as well as *Porphyromonas gingivalis* and *Prevotella intermedia*, which provoke disease of the tissues surrounding the teeth.

Use in medicine

In classical medicine, since the middle of the 20th century, two onion preparations have been known:

"Allilchep" (Allicerum) is an alcohol extract, which belongs to the group of antimicrobial intestinal drugs. As indications, diarrhea that occurs with dysbacteriosis and colitis, hypercholesterolemia (increased levels of cholesterol in the blood), which is a risk factor for the development of atherosclerosis, is indicated. The drug is recommended to be taken orally three times a day, 15-20 drops for diarrhea (until the pathology is eliminated) and 20-30 drops for a hypolipidemic effect (long-term).

"Allilglycer" (Allilglycer) - an extract of onions mixed with sterile yellow-brown glycerin, which has a slight onion smell. The drug is used to treat trichomonas diseases (for example, vaginitis). To treat the disease, tampons are impregnated with Allylglycer and inserted into the vagina of patients for a period of 6 to 12 hours. The course of treatment is usually limited to 15-25 days.

Since the beginning of this century, homeopathic preparations in which onion tincture is diluted in potencies of 3 C, 6 C, 30 C, 50 C have gained particular popularity. , 30, 50. Also, with the help of homeopathic remedies, they try to treat severe purulent inflammation of the tissues of the fingers (panaritium), paralysis of the facial nerve, burns, hemorrhoids, inflammation of the mucosa of the Eustachian tube connecting the middle ear to the pharynx, etc. However, official science homeopathic remedies as therapeutic does not consider.

In folk medicine

In folk medicine, onions are one of the most popular products: they treat hypertension, atherosclerosis, diabetes, skin diseases, all kinds of cold symptoms (cough, runny nose, fever), eliminate problems with digestion and excretion systems, and with its help they fight sexual dysfunction and hemorrhoids.

Moreover, there are recipes similar to each other in folk medicine of various Western and Eastern countries: for example, mixtures of onion juice with honey are equally popular in Bulgaria and China. So, cough in both traditions is eliminated with a "syrup" made from onion juice and sugar. The onion is peeled, cut in half, each half is sprinkled with sugar (1 tsp), and then, after an hour, the "syrup" formed on the surface is eaten. The procedure is repeated twice a day. A mixture of sugar and onion juice is also considered an effective diaphoretic. Steamed onion with sugar is prescribed for diseases of the gallbladder, liver.

Inside, onions and onion juice in various combinations are used for problems with the gastrointestinal tract (functional decrease in the tone of the intestinal walls, chronic constipation), colds, kidney stones, edema, increased pressure, menstrual irregularities. Moreover, in chronic diseases, it is often advised to simply introduce onion into the diet on an ongoing basis or regularly (daily) add a small amount of onion juice to food (from 1 tsp to 1-2 tbsp. L).

Onion phytoncides are actively used for local inhalations and general air purification from microbes. Often, chopped onions are simply laid out in plates around the room during periods of epidemics of viral diseases. The effectiveness of such methods among doctors is highly questionable. As a non-pharmacological alternative, it is proposed to simply ventilate the room, ensuring the movement of clean air.

With pneumonia, tonsillitis, acute inflammation of the upper respiratory tract, tuberculosis, inhalations are made with onions. To do this, it is convenient to use a teapot, which is first rinsed with boiling water, and then a third or a quarter is filled with finely chopped onion cubes. You can breathe fumes through the spout of the kettle (for 10 minutes 2-3 times a day).

Externally, onion juice is used in the form of compresses for abscesses, ulcers, dermatitis, burns and frostbite. Diluted (mixed with water), onion juice in folk medicine is used to treat cataracts, to improve visual acuity and simply to wash the eyes (in this case, a tear effect is used).

Decoctions and infusions

Due to the already strong action of pure freshly squeezed onion juice, water infusions, alcohol tinctures and onion decoctions are used less frequently in folk medicine than infusions of most other

vegetables. In addition, during the temperature exposure, which inevitably occurs during the boiling process, a significant part of the useful components is lost. But in some cases, this method of therapy is recommended.

Infusion for type 2 diabetes . Crushed heads (3-4 medium or 2-3 large) are cut into small cubes, poured with boiled but cooled water (2 l) and loosely covered with a lid. In this form, the onion should be infused for about a day. After that, the solution is taken in a third cup (about 70 ml) 30-40 minutes before meals 3 times a day. The course of treatment lasts 3 weeks with a two-week break. In total, 10 cycles can be carried out before a longer break. Onions in the bank are updated every 5-7 days. And before the change of raw materials, at the moment when about 400 ml remains in the jar, chilled water is simply added to it.

Decoction in milk for bronchitis . Medium-sized onions (2 pcs.) Finely chopped and boiled in milk (250 ml) until boiling. After that, the broth is infused for another 3-4 hours, filtered and taken 1 tbsp. l. every 2 hours.

Onion decoction for sore throat . For the treatment of the throat, one medium finely chopped onion is boiled in a glass of water. In different recipes, water is either simply brought to a boil, or kept boiling over low heat for another 2-3 minutes. Gargle with warm decoction every hour.

In addition, those parts of the onion that cannot be used without additional processing are often boiled and infused. So, for example, a tincture of onion flowers, aged in sunflower oil, is recommended to drink for bronchitis, pneumonia, and also to be used externally in the form of compresses for eczema. A recipe for a decoction of onion husks is common, which is prescribed as an effective expectorant, prescribed for stomatitis, drunk for problems with blood vessels, diseases of the kidneys, bladder. Husk from one large onion is usually taken per liter of water for decoction.

in oriental medicine

In traditional Chinese medicine, onions are warm, spicy, bitter foods. On the Yin-Yang scale of foods from -3 (maximum Yin) to +3 (maximum Yang), onions have a value of +1, considered a very good, balanced vegetable. Introduced into therapeutic programs, it is able to tone the qi of the liver, kidneys, lungs, and move the blood of the urinary and gall bladders.

There are many Chinese recipes for using onion in blood cleansing procedures, reducing high fever, getting rid of colds and coughs, healing wounds and burns:

Purification of the blood . This procedure is based on the idea that all internal organs have projections on the feet of a person, and if you act on the nerve endings of the feet with the help of a healing bow, then the energy will spread through the meridians throughout the body. For ease of carrying out the procedure, onions are cut into large rings, these rings are applied to the feet and thick enough socks are put on top so that the onion does not move. With a bow in his socks, the patient sleeps until morning. But for complete cleansing of the blood, you need to repeat the procedure for a week.

Elimination of fever . The high temperature is brought down in a similar way, but a cloth napkin soaked in a mixture of grated onions and potatoes with the addition of lemon juice is applied to the feet. Additionally, a gauze pad moistened with a mixture of apple cider vinegar and water is placed on the forehead.

Removal of inflammation of the ear . Pain in the ears is also treated with a night procedure, only here the role of the medicine is played by the onion core, which is inserted into the ear hole until morning. Such therapy should relieve pain and, if necessary, soften earwax.

Lotions are applied with chopped white onions and for insect bites (after removing the sting, in case of a bee sting). And to get rid of purulent wounds, onion paste is prepared, which contains, in addition to grated onions, white wheat bread dipped in boiled milk.

In Tibetan medicine, onions (tsong) are considered pungent, spicy, salty, sweet, hot, and heavy. With its help, they correct violations of Wind and Mucus, improve sleep, eliminate digestive problems - in particular, disorders of absorption, assimilation of food, and removal of gases.

In scientific research

Scientists around the world are studying the ability of onions to resist oxidative stress, cancer, diseases of the cardiovascular system, and also explore a number of other therapeutic properties of this vegetable crop.

Italian scientists have extracted and analyzed the composition of phenolic compounds (anthocyanins and flavonols) found in onions and their ability to combat oxidative stress in the human body. For the study, 2 varieties of onions were selected: Koper (common) and Tropea (red). Quercetin, kaempferol, isorhamnetin, cyanidin were found among the most significant components. The scientists found that the use of onion phenolic extracts reduced the oxidation of low-density lipoproteins ("bad cholesterol") and protected red blood cells from damage caused by oxidative stress. An increase in glutathione levels by 15-22% was also recorded. But, in general, onion extracts of both varieties demonstrated protective functions [5].

In yet another study, scientists examined the effect of onion peel extract on cells subject to oxidative stress. The experiment was carried out on yeast that was exposed to the heavy metal cadmium. As a result, in the yeast cells to which the onion extract was added, a lower amount of free radicals, a lower level of lipid oxidation, and a high content of glutathione were recorded. Also, this sample was distinguished by the activity of antioxidant enzymes. The degree of influence of the extract depended on the dose [6].

Due to the presence of flavonoids in its composition, onion extract has anti-cancer potential. To test its therapeutic effect, scientists took pathogenic cells of the large intestine (colorectal adenocarcinoma) and five varieties of onions grown in Ontario (Canada). Their effectiveness was determined in comparison with extracts of pure flavonoids (quercetin, kaempferol, myricetin). It turned out that they are in no way inferior to the latter. Varieties Stanley and Fortress cause the strongest cytotoxic effect (cell necrosis). In turn, the same variety Stanley, together with Lasalle, significantly reduced the migration activity of cells. As a result, all extracts were beneficial in the fight against colon cancer, but the most effective was the onion extract of the Stanley variety [7].

Regular consumption of onions and garlic has been linked to a reduced risk of breast cancer. Scientists have suggested that the low incidence of breast cancer in Puerto Rican women is due to the fact that their diet contains sofrito (a sauce with onions and garlic in the composition, which in Puerto Rico is added to almost all side dishes, as well as soups). This was confirmed by a 6-year study in which 314 women with breast cancer and 346 healthy women took part. The conclusions were made on the basis of observations of them, their diet and the study of the questionnaires that they filled out [8].

In folk medicine, onions and garlic have been used as antimicrobials for a long time, but now there is scientific evidence of their effectiveness. Alcohol, ethyl-acetate and acetone extracts of onion and garlic were separately combined with common antibiotics chloramphenicol and streptomycin and their antibacterial activity was tested on 15 bacteria. A tangible synergistic effect was achieved from the

combination of onion ethyl acetate extract and chloramphenicol, which successfully fought against *Staphylococcus aureus* and micrococci [9].

Scientists have also found that, due to the high content of flavonols (mainly quercetin and quercetin glycosides) in onions, an alcoholic extract based on it has anticoagulant (blood thinning) and antioxidant properties. The researchers concluded that onions should be included in the diet to prevent thrombosis and cardiovascular diseases, as well as diseases associated with oxidative stress [10]. And American scientists have found that the antithrombotic properties of onions depend on the content of sulfur in it. Moreover, the more it is, the more pronounced the effect becomes [11].

Weight regulation

Onions are often used in weight loss programs. Doctors began to prescribe this vegetable in the fight against obesity back in the days of the “father of European medicine” Hippocrates, who lived in 460-370. BC e. Onions contain only 35-45 kcal. In addition, its components, to a greater or lesser extent, provide indirect assistance in getting rid of extra pounds:

- fiber increases the period of satiety, and, accordingly, helps to reduce the number of meals without loss of efficiency,
- vitamin B6 suppresses appetite by participating in the control of blood sugar levels,
- potassium is responsible for water and electrolyte metabolism,
- copper speeds up carbohydrate metabolism, as do some other substances in onions that provide metabolism.

However, it is difficult to live even one week solely on an onion diet, therefore, in the most popular weight loss menus, onion rather becomes an addition to the main dishes of chicken, veal, boiled fish, but its share increases compared to the usual diet. The exception is onion soup, which, wanting to lose weight faster, overweight people completely switch to for 5-7 days,

As part of a dietary (non-classical) version of the soup for 2 liters of water, it is taken: onions (6 pcs.), White cabbage (0.5 heads), sweet pepper (100 g), tomato (3 pcs.), Medium-sized carrots and celery (1 pc.). The soup is cooked before the ingredients are boiled. Salt is added to taste before serving.

In cooking

Onions in cooking are used in raw, boiled, fried, browned pickled and salted forms. Although, in order to preserve all the useful properties, a minimum thermal effect is recommended. Onions can be both a flavoring seasoning for the main dish (and it is combined with meat, and fish, and rice, and potatoes, and flour products, and cottage cheese, and other vegetables), and the basis of the recipe. Many national cuisines have their own "signature" culinary products, in which onions can be called a key ingredient: French onion soup, British onion pie, Russian onion tyurya, etc.

There are some culinary tricks that will allow you to cook this product (or a dish based on it) as tasty as possible:

If you add a little granulated sugar to the oil during the frying process, the onions will brown better.

So that the chopped onion does not burn during sautéing, before sending it to the pan, you should roll the "straw" in flour. Then it will just take on a reddish tint.

Onions can be added to minced meat not only to improve the taste, but also to extend the shelf life of the meat part.

To get rid of onion bitterness when making salads, raw onions are scalded a little with boiling water, and hands and a knife are smeared with wet salt.

Smell and tears - two "sins" of onions

"Difficulties" with onions begin at the cooking stage - the irritating effect of sulfuric acid almost always provokes tears, which makes slicing onions a common problem. In order not to cry during this process, it is necessary to understand the mechanism of the formation of an irritating factor and use effective eye protection techniques.

Bulb cells contain enzymes and amino acids that do not interact until the septa are damaged. When cut, they begin to mix with the formation of 1-sulfinylpropane, a substance that causes lacrimation by irritating the mucous membranes. As a result of the dissolution of the vapors of this substance in the lacrimal glands, sulfuric acid arises. It is not enough to cause serious damage, but enough to make tears flow.

It follows from this that the less bulb cells are damaged, the less lachrymator (tear provoker) will eventually appear, which means that if you use a very thin and sharp knife blade when chopping, you will have to cry less often. It is believed that this is one of the secrets of professional chefs who boast that they do not cry when cutting onions. In addition, professionals work very quickly, and, therefore, they expose the mucous membrane of the eye to irritating fumes for less time.

Since onion tears occur as a result of a chemical reaction, the effect of the lachrymator can be reduced by slowing it down. The easiest way to do this is to cool the onion in the refrigerator for 20-30 minutes before cutting.

Another way to avoid tears is to constantly rinse the lachrymator off the knife (by slicing under a thin stream of water) or blow the fumes of 1-sulfinylpropane to the side. This is the basis of the popular advice - to whistle when chopping onions. The air blown out during the whistle will not allow dangerous vapors to enter the mucous membrane of the eye in full.

And Japanese breeders generally radically decided to rid the world of the tearful onion problem. In 2016, the British tabloid The Daily Mirror reported that after 20 years of experimentation with onion cells, specialists from Japan managed to develop a variety that almost does not emit tear fumes. The variety was named "Smiling Ball". It was reported that its sweetish taste resembles an apple. A package of two onions in the same 2016 appeared on the shelves of the country at a price of 450 yen, which at that time was about 4.3 dollars.

It turned out to be more difficult to cope with another "sin" of onions - with its sulfuric smell. Numerous recommendations for its elimination by rinsing the mouth do not radically solve the problem, because the source of the smell is not in the mouth, but in the lungs. When chewing onions, amino acids, mixing with enzymes, are converted into odorous disulfides, which penetrate the intestinal walls into the blood and are carried by it throughout the body, entering the lungs and from there with each exhalation into the environment.

But rinsing your mouth still reduces the intensity of odors. Green tea, lemon water, milk are well suited for this. You can chew parsley, other vegetables and fruits, or use special means that interrupt the smell (peppermint infusion, chewing gum, etc.).

In cosmetology

In the care of the skin and hair, various properties of onions and their husks are used:

Getting rid of dandruff and hair strengthening . To improve the condition of the hair, onion juice (4 parts) is mixed with a decoction of burdock roots (6 parts) and cognac (1 part). Some recipes use cologne instead of cognac. The resulting mixture is rubbed into the scalp 1.5-2 hours before washing. Sometimes the head is covered with a film cap. Pure onion juice to eliminate hair loss is rubbed into the skin 2-3 times a week. Strengthen hair also with onion peel. A decoction of yellow onion husks also helps to give the hair a golden hue.

Whitening effect . To make freckles less noticeable, onion juice (1 tsp) is added to the infusion of calendula flowers. To do this, flowers (1 tsp) are poured with boiling water (100 ml) and infused for 40 minutes, after which onion juice is added to the cooled infusion. The face should be wiped several times a day (2-4 times) until the pigmentation becomes less noticeable. Used in home cosmetology for these purposes and pure onion juice.

A mask of onion juice (50 ml), olive oil (75 ml), honey (10 g), egg yolk (1 pc.), Apple cider vinegar (25 ml), half an apple and vitamin C (5 ml ampoule) is also popular. . All these components are mixed, whipped and applied to areas of skin with freckles for 15 minutes.

Rejuvenating effect . Onion juice (1 tsp), mixed with honey (2 tbsp. L) and applied in the form of a mushy mask for 15-20 minutes, will help to tighten the skin and remove fine wrinkles. This mask also helps to moisturize the skin of the face.

In addition, onion masks in combination with lemon juice are used to remove oily sheen, purulent lesions and lichen are treated with freshly squeezed juice, and hardened calluses are softened with infusion of husks.

Dangerous properties and contraindications

The dangerous properties of onions are associated primarily with the ability of onion juice to irritate the mucous membrane of the stomach and intestines. The abundant use of both the onion itself and its juice is contraindicated for people with problems of the gastrointestinal tract and digestive system - patients with stomach and duodenal ulcers, gastritis, pancreatitis.

Among the contraindications are diseases of the excretory system, liver, kidneys. You should also consult a doctor before adding onions to food if you have problems with the respiratory system, diagnosing bronchial asthma.

Onions are also harmful to people with certain cardiovascular diseases: ischemic disease, rhythm disturbances, high blood pressure and heart disease. Individual intolerance and allergies also become a contraindication for the introduction of onions into the diet. Be especially careful when adding onions to children's food.

Onions are a direct threat to pets. It exhibits toxicity to cats and dogs in any form: raw, fried, dried, boiled. Due to the organic sulfoxides contained in onions, which break down into various sulfur compounds when chewed, red blood cells begin to break down, which can potentially lead to anemia. Structural changes in the blood of cats begin after eating 5 g of onion per 1 kg of body weight. In dogs, this threshold is higher - 15-30 g per 1 kg of weight.

The animals themselves may readily find and eat the bulbs without apparent harm, but this does not mean that the accumulation of toxins will not eventually lead to poisoning. Often, dogs brought to the dacha and released into the garden begin to slowly dig up and eat up the bulbs, and the owner does not even know about it. Symptoms of "overeating" onions usually appear after a few days. Poisoning is

accompanied by vomiting, diarrhea, loss of appetite, increased breathing and heart rate, the color of the mucous membranes becomes noticeably paler.

The literature also describes an indirect danger that is not directly related to the use of onions. The fact is that sometimes unsprouted bulbs of garden plants of the lily and amaryllis families (daffodils, amaryllis) are sometimes mistaken for an edible vegetable crop, which poses a certain threat, since they can cause alkaloid poisoning. Narcissus bulbs, for example, are rich in lycorine, which stimulates the gag reflex.

Selection and storage

When choosing onions, preference should be given to dense clean heads, without damage, holes and stains.

The sweetness-bitterness of a vegetable depends not only on the variety, but also on the length of daylight hours at the place of cultivation (southern onions are considered sweeter), the mineral content of the soil, the mildness of the climate, the abundance of precipitation, etc. For example, with a large amount of annual precipitation, the soil is actively washed out sulfur, which creates the preconditions for the cultivation of a sweeter vegetable. However, in general it is believed that white varieties have a stronger aroma and are better suited for filling pies, red and purple ones have a sweet taste and combine well in salads and marinades, and Spanish soft and sweet onions with yellow-brown husks are better suited for sautéing. .

Suppliers sometimes irradiate bulbs to prevent germination. If you fundamentally want to avoid buying irradiated vegetables, you should focus on the products of farms that, even in the process of growing, use technologies that reduce the likelihood of bulb germination during storage: reduce the intensity of irrigation during the ripening period; planted on high beds so that excess moisture in case of precipitation is concentrated in the aisles, regulate soil salinity, etc.

The most proven way to store onions at home is in a “pigtail” bundle suspended in a room at room temperature (18-24 C) away from sources of heat and bright light. The husk (outer protective shell) does not need to be removed. Such a basketry is decorative, the bulbs in it are well ventilated, while they are easy to separate one by one from the common bunch. Sometimes, in order to ensure air circulation, the onion is placed in a wire hanging basket or a box with a perforated bottom.

In this form, the vegetable crop can be stored for about 8-9 months, provided that the rotting bulbs are removed from the bunch in a timely manner. Sweet varieties are stored less - up to 4-5 months.

It happens that to save space, onions are stacked together with other vegetables, such as potatoes. You don't need to do this. Due to the onion moisture, the potatoes will begin to deteriorate much faster, in addition, the rot also spreads to the onion heads.

It is also undesirable to put onions in the refrigerator for long-term storage - at low temperatures, the onions soften. But if the onion is already chopped, then it can and should be sent to the refrigerator for 2-3 days, wrapped in a bag to prevent moisture loss and placed in a glass jar under the lid so that all other products in the refrigerator are not saturated with onion smell. The need to store already chopped onions in the refrigerator is associated with the danger of an increase in the number of dangerous bacteria (for example, strains of E. coli).

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Bulb onions - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of cottage cheese and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of cottage cheese in various types of medicine and the effectiveness of its use in various diseases are considered. Potentially adverse effects of cottage cheese on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: cottage cheese, benefits, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of cottage cheese (according to [Food+](#)).

Main substances (g / 100 g):	Curd [1]
Water	81.01
Carbohydrates	6.66
Squirrels	10.34
Alimentary fiber	0
Sugar	1.85
Fats	0.29
Calories (kcal)	72
Minerals (mg/100 g):	
Potassium	137
Phosphorus	190
Calcium	86
Sodium	372
Magnesium	eleven
Iron	0.15
Zinc	0.47
Copper	0.03
Vitamins (mg/100 g):	
Vitamin C	0

Vitamin B6	0.016
Vitamin PP	0.144
Vitamin B1	0.023
Vitamin B2	0.226
Vitamin E	0.01

The data in this table is based on a product that in Europe, the United States and some countries in the Middle East is called "cottage cheese" (the literal translation is "village cheese"). In our country, this product is most often called granular (or grained) cottage cheese, in rare cases using the name "Lithuanian cottage cheese".

The calorie content of cottage cheese is low - only 72 kcal. But it must be borne in mind that he himself is one of the varieties of low-fat cottage cheese (from 0%). While on the shelves of our stores and markets you can also find a much more fatty product (up to 23%), which is also called cottage cheese, but contains 3 times more calories, has a different consistency, acidity and the ability to "give away" useful minerals (for example, calcium), if you use it as an independent dish. Fatty and low-fat foods differ noticeably in the content of vitamins A, E, B12, as well as the presence of zinc, fluorine, copper, and folic acid.

Therefore, in order to correctly assess the beneficial and harmful qualities of cottage cheese, we must first more clearly define the object of consideration and understand what kind of cottage cheese we are dealing with as consumers.

Types of cottage cheese: common and distinctive characteristics

Any cottage cheese is a non-liquid product that is obtained by fermenting milk. Responsible for this culture of lactic acid bacteria. During the cooking process, sometimes (and sometimes not) rennet and calcium chloride are used, and at the end, some of the whey is removed. But since both the raw materials and the characteristics of the production of cottage cheese are different, the final product will also have a different structure, consistency, acidity and fat content.

The generally accepted and official division of cottage cheese occurs according to the parameter of fat content. Physical and chemical indicators allow us to distinguish 4 main groups of the product:

- Fat-free (dietary) - 0%. A small percentage of fat is still retained in it, but it is usually less than one.
- Lean - 1.8%.
- Medium fat content (classic) - 4-18%.
- Bold - 19-23%.

At the same time, the folk tradition introduces numerous additional gradations, among which one of the most common is the division of cottage cheese into store-bought and homemade.

Comparison of homemade and store-bought cottage cheese

It is customary for people to oppose homemade and store-bought cottage cheese, and in this competitive struggle, for some reason, the advantage is immediately given to the home cooking method, as more correct and useful. But is it? Let's compare homemade and factory cottage cheese, considering in general terms the process of their production.

Standardization .

In production, all processes are standardized, and the raw materials used are checked for compliance with the requirements. The result is the same product with predictable taste, physical and chemical properties.

At home, it is difficult to achieve the same high stability. The homemade product will change as the skill of the “author” grows, even if the “author” is very attentive to the preparation procedure and does not allow mistakes or carelessness.

Milk .

Factory cottage cheese is made exclusively from pasteurized milk, which is due to the requirements of GOST. With such a gentle method of temperature exposure, non-spore-bearing vegetative bacteria are destroyed. And in order to get a product with the planned fat content at the output, the feedstock is also usually taken normalized in fat content. And in any case, the production uses a mixture of milk from a whole hundred of cows (or collected from cows from various farms).

In urban households, pasteurized milk is also sometimes used to make cottage cheese. But more often, fresh whole milk from one cow is taken as raw material, which is not pasteurized and is almost always subject to uncontrolled bacterial action during milking and transfusion. This does not necessarily “worse” the curd (lactic acid bacteria are simply necessary for the fermentation of milk), but the risks of infection with pathogenic microbes increase.

Sourdough .

In production, cultures of bacteria are introduced into pasteurized milk, as into a purified nutrient medium, which need proteins, fats, sugars (lactose) for reproduction. The result of lactose being eaten by bacteria is lactic acid, due to which a fresh product turns into fermented milk. Therefore, the purity of the bacterial culture used greatly affects the taste of the resulting curd. Often, technologists use combinations of 3-4 strains of various bacteria in experimentally verified ratios.

In homemade cottage cheese, fermentation occurs both due to those bacteria that are already contained in the milk, and those "accidental" that enter the milk from the outside. Sourdough can be kvass, kefir, sour cream, etc. But it's difficult to talk about the purity of a colony of bacteria here, since even in store-bought pasteurized milk, after a certain period of storage, various microorganisms begin to multiply uncontrollably. As a result, the taste of ripened homemade cottage cheese each time will most likely be at least a little, but different.

Coagulation (coagulation) of milk proteins.

To obtain a curd clot in fermented raw materials, the protein must coagulate. This is achieved by heating (acid method) or fermentation (acid-rennet method). Often, calcium chloride is added to the raw material, which accelerates clotting and separation from whey, and also gives a greater yield of the product.

In production, curdling is carried out in various ways, indicating the choice of technology on the packaging. So, if the label says that the composition includes only milk and sourdough (without mentioning enzymes), then this means that the product was simply heated (“cooked” in an acidic way).

It is believed that since heating leads to the death of lactic bacteria, there is less potential benefit from such cottage cheese. Therefore, information about the introduction of rennet (or pepsin) to obtain a curd clot is placed on the packaging, rather, as an advantage of the product. At the same time, it is necessary to monitor the presence of a mixture of vegetable fats, with the help of which manufacturers sometimes reduce the excess acidity of the product.

In home production, the choice of technology primarily depends on family and regional traditions. According to the classical Slavic recipe, curd clot was obtained from curdled milk - it was either left in a cooling oven or heated to 85-90 °C. That is, they used a method that has received the name "acidic" in our time. The southern tradition, on the contrary, assumed widespread fermentation. For example, in the Caucasus, for processing with rennet, milk was poured into a washed goat (sheep) stomach and exposed to the sun. The only thing left for people to do was tap the waterskin with a stick from time to time - the rest was done by bacteria and rennet of the stomach.

Serum department .

In production, part of the whey is separated from the curd mass either on special machines that use centrifugal forces during rotation, or on perforated press tubs, or by self-pressing. At home, different methods of filtration and pressing are used, which sometimes leads to "dehydration" and drying of the curd. Excess serum discharge may also be a sign of a violation of the storage temperature conditions.

Structure and consistency: differences between "regular", granular, soft cottage cheese

The principal factor affecting the consistency of cottage cheese is the method of coagulation of milk proteins. With the same humidity (equal to the mass fraction of moisture), a softer, pasty product at the output will be cottage cheese prepared using enzymes. After such preparation, a stronger curd is obtained, which, if necessary, is easier to spread, since the effective viscosity of such a product is twice that of acid curd.

When the proteins are coagulated by heating, the curd will turn out to be more crumbly and dryish. Structurally, it can already be correlated with grained (grain) cottage cheese. But in modern industries, in the manufacture of branded grain cottage cheese (" cottage cheese"), pepsin or rennet powder, as a rule, is still added. And, besides, there are additional technological tricks that allow you to cook tender curd grain for " cottage cheese":

- compliance with the required concentration of solids in skimmed milk (sometimes protein is added to the composition to adjust),
- choice of starter culture and ratio of strains (with the inclusion of bacterial strains that do not emit large amounts of carbon dioxide),
- specific treatment of the clot (to maintain the balance of acidity).

Perhaps the biggest confusion in terms arises when talking about "ordinary" cottage cheese. Here the word "usual" usually becomes synonymous with the word "usual" (to the speaker). And therefore, in one context, granular cottage cheese can be considered "ordinary", and in another context, soft, pasty. As a result, in two similar questions - "How does ordinary cottage cheese differ from granular?" and "How does soft cottage cheese differ from ordinary one?" - "usual" will be called a product completely different in consistency and structure.

Still sometimes "ordinary" is called cottage cheese, prepared in the traditional acid or acid-rennet method, as opposed to a separate production method. This method is called "separate" because skimmed raw materials and 50% cream are first obtained from milk by separation. Then, low-fat cottage cheese is prepared from milk using enzymatic coagulation of proteins. And then it is mixed with cream.

Sour and fresh cottage cheese

The acidity of cottage cheese is closely related to the vital activity of bacteria. If the product was not subjected to heat treatment during manufacture, then it means that the bacteria were not destroyed by

heating, therefore, acid-rennet curd will turn out, other things being equal, more acidic than acidic (heated). In addition, its acidity will increase as lactic acid bacteria multiply and become active, which always occurs during storage.

However, it must be taken into account that the activity of bacteria in the product is inhibited by milk fats, becoming the so-called stop factor for microorganisms. Therefore, the fatter the cottage cheese, the less sour (more "fresh") it turns out and vice versa - fat-free cottage cheese will turn out to be the most sour if its taste is not artificially "corrected". The dependence of acidity on the fat content of cottage cheese can be expressed in the table, where acidity is indicated in Turner degrees ($^{\circ}\text{T}$):

- Up to 240°T - fat-free cottage cheese (0%).
- $170\text{--}230^{\circ}\text{T}$ - medium-fat cottage cheese (5-9%).
- Less than 200°T - fatty cottage cheese (19-23%).

But cottage cheese is in any case a rather sour product. This can be seen by comparing its indicators with those of other fermented milk products, where sour cream and fermented baked milk usually fit in the range of $65\text{--}90^{\circ}\text{T}$, kefir - in $80\text{--}120^{\circ}\text{T}$. However, since not everyone likes the sour taste, at home raw materials are fermented with kefir, which as a result makes the product more insipid.

How to take into account all of the above parameters when choosing cottage cheese before buying, we will describe in more detail in the section "How to choose and how to store cottage cheese". In the meantime, let's pay attention to how specific characteristics of cottage cheese can affect the medicinal effectiveness of this product.

Medicinal properties

of vitamins B. Thanks to them, this product improves the condition of bone and cartilage tissues, provides the regenerative ability of the nervous system, increases hemoglobin in the blood, and helps in the treatment of diseases of the cardiovascular system and liver. It is included in the diet to improve fat metabolism and treat obesity.

Cottage cheese belongs to easily digestible products. After processing, the milk protein in the curd becomes even more accessible for enzymatic breakdown than whole and fermented milk. Also, for its processing, the body needs less hydrochloric acid.

For medicinal purposes, the diuretic properties of cottage cheese are also used, which improves the condition of people with high blood pressure, kidney problems, heart and vascular diseases.

Methionine

A large amount of this essential amino acid explains the benefits of cottage cheese for the liver. Thanks to methionine, several problems are solved at once:

Aid in the dissolution of fats. Methionine prevents fat deposition, ensures the normal production of bile and the removal of excess cholesterol. To improve the liver, a product with a 5% fat content is better suited.

Fighting free radicals. The antioxidant effect of the action of the acid protects cells from destruction.

Increased intestinal peristalsis. Cottage cheese protein creates a favorable environment for the intestinal microflora and increases its peristalsis, which helps with constipation (although this rule does not apply to low-fat cottage cheese, which can only exacerbate the problem).

Calcium

One of the main beneficial properties of cottage cheese is the high content of calcium in it. Depending on the type of product of this mineral, cottage cheese contains from 70 to 170 mg / 100 g. Calcium is necessary for the normal formation of bone tissue, the functioning of the cardiovascular system, the implementation of hormonal metabolism, and the transmission of nerve impulses. Without calcium, the absorption of other trace elements (phosphorus, magnesium, vitamins K and D) is impossible.

The reputation of cottage cheese (without division into types of product) in terms of calcium content has long remained impeccable. But in recent years, cottage cheese has ceased to be talked about as the main source of calcium in the diet. Firstly, leadership in this parameter is now clearly given to hard cheeses, some types of cabbage, poppy seeds, sesame, chia (Spanish sage). Even among closely related products, cottage cheese has stronger competitors (whey, milk). And, secondly, no less important than the amount of the mineral is the factor of its bioavailability. In fermented milk products, up to 80% of calcium is absorbed, but not in all, since digestibility depends on the accompanying amount of fat.

When taken with food, 1 gram of fat absorbs 10 mg of calcium. If we take into account the calcium content at the level of 85-95 mg / 100 g of the product, it turns out that about 8.5-9.5 g of fat is needed for its absorption. Such a balance is achieved in classic cottage cheese with an average 9% fat content. Potentially, calcium in the same volume can be obtained from fat-free cottage cheese, but then the fat necessary for absorption will need to be added independently. In this case, you will have to take into account that excess fat also disrupts the absorption of the mineral.

If the percentage of calcium in 100 grams of the product is higher, then the fat content should be higher for better absorption. The paradox is that in low-fat cottage cheese there is even a little more calcium than in fatty one, because of which the mineral-fat natural balance begins to be disturbed.

You can correct the situation by eliminating vitamin D deficiency , paired with which both calcium and magnesium are well absorbed. There are several forms of vitamin D , but the most mentioned are cholecalciferol (D 3, which is synthesized under the influence of ultraviolet radiation) and ergocalciferol (D 2, which we get from food). There is a lot of D 2 in fish oil, portobello mushrooms (champignon varieties) and shiitake. However, a healthy person living in the middle lane usually has enough D 3 formed during a natural lifestyle (that is, for this it is not necessary to specifically increase the amount of time spent in the sun). But an overdose of D 2 obtained with food additives is dangerous and can lead to hypercalcemia with a lot of negative consequences. Therefore, fortified changes to an already balanced 9% product should be made with great care.

The total amount of calcium in the curd also increases when calcium chloride is used for curdling. However, such calcium is poorly absorbed, and in production it is used not so much to improve useful properties, but to increase product yield and accelerate protein coagulation.

Almost all the same medicinal properties as cottage cheese have curd whey. For 93-94% it consists of water, and the remaining 6-7% includes lactose, whey proteins, a small amount of easily digestible milk fat, due to which the benefits of whey are manifested. The calorie content of whey is on average 3 times lower than that of milk, which is why it often becomes the main product in the diet.

If there is no lactose intolerance, whey helps in the digestive tract. But taking into account the fact that the percentage of intolerance among the Eastern Slavs is in the range of 16-18% of the entire adult population, it is better to pay special attention to this before using the serum.

Use in medicine

In classical medicine, cottage cheese is not used for direct treatment. But in some cases, doctors recommend including different types of cottage cheese in diets, depending on the patient's disease. So

often a low-fat product is introduced into the diet of diabetics, a fatty product into the diet of those suffering from constipation, a 5% product is recommended to improve liver function. Let's say low-fat cottage cheese for cholecystitis (in the non-acute phase) and for pancreatitis (after consulting a doctor).

In folk medicine

The general therapeutic properties of cottage cheese are also used in folk medicine. It is eaten to strengthen bones, cartilage and teeth, to improve the condition with atherosclerosis, hypertension, problems with the gastrointestinal tract and excretory systems (it is prescribed to relieve swelling).

But folk healers are expanding the range of use of cottage cheese. With its help, cough of various nature, bronchitis and pneumonia are treated. There is a compress recipe that replaces the mustard plaster. To prepare a compress, 2 tablespoons of honey are taken for 200 g of cottage cheese (usually sour) and the mixture is heated in a water bath or in a microwave oven. Then the composition is laid out in one layer on a cloth or gauze folded in 2-3 layers, covered with the same cloth and fixed on the back and / or upper chest, first fixed on the body with cling film and then with a scarf.

in oriental medicine

Despite the fact that cottage cheese is considered a traditional product, primarily for the countries of Eastern, Northern and Central Europe, there are also Eastern traditions of using this fermented milk food in the treatment of patients. So, in the textbook of Tibetan medicine, cottage cheese (there it is called "sho") from cow's and goat's milk as a sour, cold and heavy product is recommended for bile diseases. In a preventive diet prescribed for healthy people with unbalanced digestion (with 1st and 2nd degrees of gastric fire), cottage cheese is recommended to be consumed between 11 and 16 hours of the day.

In the reference books of oriental medicine, there is also a recipe for baldness with sour curd and coarse salt (grinding No. 2) in equal proportions. Cottage cheese in this pair should soften the old coarsened epidermis, and salt should stimulate the formation of new hair follicles. This mixture should be applied with a cotton swab, rubbed into the hair roots and covered with a plastic cap with a warming scarf or towel for 40 minutes. True, the authors warn that the chances of restoring hair in choleric and sanguine people, as well as people with high hemoglobin levels, are higher.

In scientific research

In their research, scientists most often study not cottage cheese itself, but its components (for example, amino acids) and their effects on the body. But sometimes it is the curd protein that is in the center of interest, which is compared both with a similar isolated component from dietary supplements, and with the proteins of other food products.

The influence of curd protein on glucoregulation compared with the influence of cod and soy proteins [2].

While investigating the potential use of various protein foods in the treatment of type 2 diabetes (in relation to the effect of the protein on plasma glucose levels), the scientists conducted a comparative experiment with cod, soy and cottage cheese proteins. The experiment involved 17 healthy adults. As a result, it was found that the consumption of cottage cheese along with a regular meal led to an increased insulin response after 4 hours and a better insulin/glucose ratio after 2 hours, compared with cod and soy proteins (although cod protein caused a stronger glucose response after 1.5 hours compared to cottage cheese and soy). Remarkably, 40 minutes after a meal, the same insulin peak was

observed with all types of protein, but the level remained the same high for a longer time only in the case of cottage cheese.

In the experiment described, scientists could not say for sure whether this was due to the fact that more insulin was produced in response to eating cottage cheese, or due to the fact that the liver cleared the insulin produced by cod and soy proteins faster. Also, scientists could not guarantee that the effect obtained in an experiment with healthy people would be repeated in an experiment with diabetic patients. However, they clearly determined that there is a difference between the effects of the studied proteins on the body, that these proteins can act differently (stimulate insulin production or directly regulate glucose levels) and that the topic should be considered in the context of the formation of promising therapeutic programs for the treatment of diabetes 2- type.

Comparison of the influence on the metabolism of dietary supplement protein as a separate component with curd protein in the composition of the product [3].

In this study, the effect of the protein supplement and the protein in the curd was compared, as sometimes the effect of the whole product differs from the effect of a single component of it. The experiment was carried out with granular cottage cheese. Active young girls (on average, about 20 years old) consumed 30 to 60 g of granular cottage cheese 30-60 minutes before bedtime - 2 hours after the last meal. In total, 10 girls took part in the experiment, who came to the laboratory by 18:00 and stayed there until the morning.

In the morning, from 5 to 8 am, 2 parameters were measured in the participants of the experiment: RER (Respiratory Exchange Ratio) - the respiratory exchange ratio (the ratio of O₂ spent and CO₂ production) and REE (Resting Energy Expenditure) - energy consumption at rest. Scientists noted an improvement in metabolism and a positive effect on the condition of the muscles in all girls, but they did not find a difference between the protein supplement and cottage cheese. The participants also expressed their subjective opinion about the increase / decrease in morning appetite after different proteins. Here, too, no difference was found.

Weight regulation

Cottage cheese for weight loss is used in almost all programs that allow you to lose weight. The calorie content of cottage cheese depends on its fat content, and can be roughly described by the following table:

- Fat-free - 70 kcal / 100 g.
- Low fat - 85-90 kcal / 100 g.
- Classic - an average of 150 kcal / 100 g.
- Fat - more than 220 kcal / 100 g.

The data is approximate, since products in the range from 4 to 18% fall under the definition of "classic cottage cheese". But it is clear that the nutritional value here is the lower, the lower the percentage of fat indicated on the package.

In extreme cases, losing weight people switch to fat-free cottage cheese with 0-1.8% fat, but this approach is falling out of fashion due to the dietary imbalance of this product. To effectively lose weight, it is enough to choose a cottage cheese diet based on 5-9% cottage cheese, but not to abuse the quantity (frequency of meals, portion sizes, sweet and high-calorie dressings).

In its classic form, with a curd diet, half a kilogram of the product is eaten per day. This volume is divided into 5 meals with the inclusion of a small amount of banana, flax seeds or honey. Cottage cheese is washed down with a glass of low-fat kefir in the morning and a glass in the evening. By the

way, in addition to reducing the energy value, such a diet also helps to dry out due to the diuretic properties of cottage cheese.

A cottage cheese diet (more precisely, a mono-diet) is not suitable for everyone, because it is difficult to stick to one product for a week. For different people, it gives a different effect, but usually we are talking about dropped 1.5-2.5 kg in 7 days with an uneven decrease in volume in the waist, hips and chest.

One of the popular tips from nutritionists says that protein foods are more satiating if they are in a solid (not liquid) form. And although not every advice from nutritionists works equally well, some volunteers tested this advice on themselves, recognizing its effectiveness. So, in the above reports, after drinking yogurt for breakfast, I had to return to the table in half an hour, and after eating cottage cheese, it was relatively easy to wait for dinner.

Some nutritionists pay attention to the fact that you should not eat cottage cheese at night for weight loss. This is explained by the fact that with a low glycemic index (30), the insulin index of cottage cheese is much higher (120) - that is, the pancreas reacts to cottage cheese with an insulin release, which blocks the work of lipase as a key fat-burning enzyme and the "slimming hormone" of somatotropin, which is responsible for burning fat. And since the peak production of this hormone occurs at night, evening cottage cheese begins to interfere with its work.

In cooking

In cooking, cottage cheese is eaten raw, fried, baked, boiled. At the same time, to prepare the dish, the cottage cheese is usually pre-ground (rubbed) - passed through a sieve with a spoon or "crusher". In modern equipped kitchens, blenders are used for this. In grated form, the cottage cheese turns out to be more tender, airy and homogeneous.

In the list of the most famous curd dishes:

- cheesecakes (cottage cheese) - they are most often fried in vegetable oil or baked in the oven, less often they are steamed,
- paski (Easter) - an Easter dish that can be made from both boiled and raw cottage cheese,
- casseroles,
- vareniki,
- cheesecakes.

Since cottage cheese goes well with dried fruits (raisins, dried apricots, prunes), berries and fresh fruits (strawberries, raspberries, apples, pears), nuts, curd dishes often include the same additives. In addition, cheesecakes are often made with the addition of greens (dill, green onion feathers) and vegetables (carrots, potatoes).

Curd dishes are traditionally served at the table with honey, sour cream, condensed milk. But there are also unexpected combinations. So, for example, the 37th US President Richard Nixon, according to biographers, loved to eat cottage cheese with ketchup. Now in our country the combination of cottage cheese with linseed oil is rapidly gaining popularity.

The pair "low-fat cottage cheese + flaxseed oil" became known thanks to the work of the German nutritionist and pharmacologist Johanna Budwig, who in the middle of the 20th century introduced a healing "nutrition protocol" designed to change the ratio of fatty acids (reduce excess saturated and compensate for the lack of polyunsaturated) in the human body. A hearty morning breakfast based on low-fat cottage cheese seasoned with linseed oil with the addition of honey, fruits, nuts, flaxseed, with

a parallel rejection of a number of other products, was considered by a nutritionist as a way to treat many diseases, including cancer. However, the scientific community did not support the ideas of Johanna Budwig.

The answer to the question, “when is it better to eat cottage cheese - for breakfast, lunch or dinner?” Depends on the purpose of eating cottage cheese. As mentioned above, it is believed that for weight loss it is better to stop eating cottage cheese at night due to the blocking of the fat-burning enzyme and the “slimming hormone”. If the goal is better absorption of calcium, then it is more advisable to eat cottage cheese before bed. This is explained by the activation of the parathyroid glands at night and the accelerated release of mineral salts at this time.

In addition, cottage cheese contains a lot of tryptophan. 18% cottage cheese contains approximately 210-215 mg / 100g, which is about 85% of the daily requirement, and low-fat - about 180 mg / 100 g. This amino acid causes drowsiness and, accordingly, helps to get rid of insomnia.

Sometimes, in order to prevent "washing out" of calcium, nutritionists do not recommend drinking cottage cheese with drinks high in caffeine (tea, coffee). There really is a relationship between caffeine and the intensity of calcium excretion, but the amount of calcium that the body loses after a cup of coffee is easily compensated by one or two tablespoons of cottage cheese. Therefore, it is not necessary to limit yourself too strictly.

In cosmetology

The composition of cottage cheese makes it possible to solve several problems at once with its help. cosmetic tasks:

- Vitamin A helps reduce inflammation
- vitamin B2 stimulates skin metabolism,
- vitamin PP protects against the effects of solar radiation,
- calcium and magnesium make the skin smooth, firm and elastic.

In cosmetology, cottage cheese is usually used in the form of masks, the basis for which is selected based on the fat content of both the skin and the product: low-fat cottage cheese is used for oily skin care, and fatty cottage cheese for dry skin care. Cottage cheese with 5-18% is suitable for combination and normal skin types. As in any other case, before application, the composition should be checked for the possibility of an allergic reaction.

Here are some examples of popular masks that are enough to apply once a week:

Nourishing mask . Cottage cheese (1 tablespoon) and in equal proportions honey and lemon juice (1 teaspoon each) are mixed and applied for 15-20 minutes on cleansed face skin, excluding the eyes and lips.

Rejuvenating mask . Cottage cheese (1 tbsp) is mixed with honey (2 tsp), banana, strawberry and pumpkin pulp (all ingredients 1 tsp each) and applied to the face for 15-20 minutes. The composition is washed off with warm water.

Mask for dry skin . Cottage cheese 9-18% (2 tablespoons) is mixed with warm milk (2 tablespoons), banana and persimmon (half of each fruit). Like the previous masks, this one is applied for 15-20 minutes on clean skin.

Dangerous properties and contraindications

Any cottage cheese is a rather acidic product, therefore, with gastritis with high acidity and ulcers of the gastrointestinal tract, it is either completely excluded from the diet, or consumed after heat treatment and in a desalinated form. In the acute phases of colitis, pancreatitis, cottage cheese is also usually excluded from the diet for several days, returning after 3-5 days and on the recommendation of a doctor.

Overeating cottage cheese can provoke an exacerbation of kidney disease (due to the abundance of protein components) or increase cholesterol levels (with the abuse of a fatty product). Fatty cottage cheese is excluded for obesity.

Also, a potential danger is posed by expired cottage cheese or a product produced in violation of sanitary standards. Pathogenic bacteria (for example, salmonella) easily multiply in a nutrient curd medium. Moreover, in cottage cheese with a lower presence of lactic acid bacteria, in the absence of natural "competition for resources", *E. coli* can settle even easier and multiply faster.

Selection and storage

When choosing loose cottage cheese, first of all, you should pay attention to color, smell and structure. The product should be white, although a slight cream shade is allowed, evenly coloring the entire curd mass. There should not be any foreign smells (except for sour milk).

Experts advise giving preference to a homogeneous product of either a crumbly or pasty consistency. In the latter case, the mass should be tender and soft. The firmer the product, the more likely it was made from a "milk construct," sometimes referred to as recombined milk. The composition of such a "construct" includes skimmed dry milk base, whey, cream, milk fats. In addition, the hardness of cottage cheese and the presence of grains and hard grains in the mass indirectly indicate the use of calcium chloride in the production. The use of high temperatures during protein coagulation allows you to increase the shelf life, but makes the product dense and "rubber".

In any case, when buying bulk cottage cheese "from hand", one should take into account the risks associated with the ingress of pathogenic microorganisms into the product, which could settle there both during the manufacturing process and during improper pre-sale storage. However, this does not mean that store-bought and sealed cottage cheese is completely insured against the danger of being spoiled. It is useful for the consumer to pay attention to the temperature in the refrigerator (it should not be higher than 6 °C), and to the packaging. In polyethylene, polymer packaging and laminated foil, cottage cheese can be stored for no more than a week, and in parchment - no more than 3 days.

Information on the packaging in general can tell a lot about the buyer.

The best cottage cheese is the one that contains only milk, sourdough and rennet. Calcium chloride is also acceptable, although homogeneity may be disturbed with its use.

Stabilizers, preservatives (most often it is E201-203), flavors, flavor enhancers, starch, palm or lanolin oils indicate that the package contains a curd product created "based on" a quality sample.

The mention of vegetable fats next to milk, sourdough and enzymes may indicate an attempt by the manufacturer to reduce acidity.

Quite rarely, only milk and sourdough (without mentioning enzymes) can be found in the list of ingredients. This suggests that the folding of proteins was carried out using heating ("cooking"). Such cottage cheese is poorly suited for casseroles and cheesecakes, since the cottage cheese dries out during repeated heat treatment. For casseroles, it is better to buy acid-rennet cottage cheese.

Since cottage cheese is sometimes bought not just for a change in the diet, but for some specific purpose, we repeat a few rules:

If you buy cottage cheese for the sake of calcium, then in the average version it is best to take a grained form with a 9% fat content (calculated as a calcium content within 90 mg / 100 g). Most likely, the packaging will not indicate exactly how much calcium is contained in this product, but you can try to find out about this on the manufacturer's website.

Fans of not very sour cottage cheese should choose a more fatty type or use a “boiled” product in which lactic acid bacteria died when heated. You can also use kefir sourdough in home cooking, which reduces acidity, or choose manufacturers who have worked out the technology for making granular cottage cheese with low acidity.

Any cottage cheese should be stored in the refrigerator in a glass or enameled resealable container at a temperature not exceeding 6 ° C and until the expiration date indicated on the package. *Ceteris paribus*, granular cottage cheese can be stored longer than soft, but still it belongs to easily perishable products. Its shelf life in sealed form usually does not exceed 7 days. Fresh "today's" home-made cottage cheese, manually sorted into bags, can be kept in the refrigerator for up to three days. But, if necessary, it can be frozen in the freezer for about a month.

In the past, cottage cheese was “canned” for future use in order to preserve excess milk for a long time. For this, the “boiled” cottage cheese, after being pressed, was again sent to the oven and pressed, bringing it to complete dryness. Then this mass was poured into a disinfected clay pot and poured with melted butter. In a cold cellar, the stock could lie for several months.

How to cook cottage cheese at home

In home practice, there are fast (with the addition of lemon), medium (with heating) and slow (using enzymes) methods for making cottage cheese. We will describe here a method with heating, in which an excellent result can be obtained in a day and a half.

In a saucepan, 5 liters of 3% milk and 350-370 ml of 3% kefir are mixed for sourdough. This "blank" is left for a day at room temperature. After a day, part (also about 300-350 ml) of the resulting fermented product can be set aside so that next time you can use not kefir for cooking, but your own ferment. The saucepan with the rest of the fermented milk is placed on the smallest fire, where it is kept for about 20 minutes until the proteins are curdled (curdling).

It is important to prevent the mixture from boiling during heating, so it is better to monitor the condition of the curd being prepared by stirring it regularly. At that moment, when the curd clots rise to the surface of the pan, and the whey separates and goes down, the fire can be turned off.

In this form (right in the pan), the product is kept until it cools completely, after which the curd is thrown onto a sieve, or collected in gauze. Since this curd mass is still saturated with whey, it is necessary to allow the excess whey to drain. To do this, the curd lump is hung directly in gauze (as a rule, above the same pan) and aged until cooked.

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Cottage cheese - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of cottage cheese and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of cottage cheese in various types of medicine and the effectiveness of its use in various diseases are considered. Potentially adverse effects of cottage cheese on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application.



Chicken egg

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Abstract. The article discusses the main properties of a chicken egg and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of chicken eggs in various types of medicine and the effectiveness of its use in various diseases are considered. The

potentially adverse effects of a chicken egg on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Key words: chicken egg, benefit, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of chicken eggs (according to [Food+](#)).

Main substances (g/100 g):	Raw yolk [1]	Raw protein [2]	Boiled or poached egg (whole) [3]	Egg fried on rast. oil (whole) [4]
Water	52.31	87 , 57	75 , 58	66.82
Carbohydrates	3.59	0.73	0.72	0.76
Squirrels	15.86	10.9	12 , 47	13.27
Alimentary fiber	0	0	0	0
Sugar	0.56	0.71	0.37	0.39
Fats	26.54	0.17	9.44	17.24
Calories (kcal)	322	52	142	215
Minerals (mg/100 g):				
Phosphorus	390	fifteen	197	209
Calcium	129	7	56	59
Potassium	109	163	137	146
Sodium	48	166	429	457
Magnesium	5	eleven	12	13
Iron	2.73	0.08	1.74	1.86
Zinc	2.3	0.03	1.28	1.36
Copper	0.077	0.023	0.072	0.076
Vitamins (mg/100 g):				
Vitamin E	2.58	0	1.04	1.95
Vitamin B2	0.528	0.439	0.431	0.459
Vitamin A	0.38	0	0.16	0.17
Vitamin B6	0.35	0.005	0.16	0.171
Vitamin B1	0.176	0.004	0.034	0.036
Vitamin PP	0.024	0.105	0.071	0.075
Vitamin C	0	0	0	0

The first two columns of the table show the content of vitamins and minerals per 100 g of the product, which allows you to correctly compare raw protein and yolk and see that the content of phosphorus, calcium, iron, zinc, vitamins E, A, B1 and B6 is almost completely "responsible » yolk. It also contains 23-26% neutral fat, 16% protein, phospholipids (11%), minerals (3%), cholesterol (0.8-1.5%). Includes polyunsaturated, monounsaturated and saturated fatty acids.

But in the protein of the same mass there is more potassium, sodium, magnesium, vitamin PP . In addition, the protein part of the egg is represented by ovalbumin (54%), antibacterial ovotransferrin (12%) and lysozyme (3.5%), etc. But in one egg, the masses of the yolk and protein are not equal. The average ratio of yolk, protein and shell in a chicken egg that has completed maturation is 8:14:3, respectively, which must be considered when including eggs in nutrition programs.

Medicinal properties

The therapeutic effect of the egg is achieved primarily due to the easily digestible protein. With regular use, it helps:

- increase muscle mass
- strengthen the bones
- maintain tissue integrity
- fight overweight
- activate brain functions
- lower blood pressure,
- prevent cataracts and improve vision,
- reduce the deposition of cholesterol formations on the walls of blood vessels,
- keep the liver working.

Chicken egg protein is generally considered the most easily digestible source of all essential amino acids, many of which have an antioxidant effect (ovotransferrin, lysozyme).

The yolk has a more controversial reputation. On the good side, it is characterized by the fact that it is useful for skin diseases, protects against osteoporosis and has a choleric effect. And the appearance of a negative assessment is provoked by the cholesterol contained in the yolk, which can potentially cause the development of cardiovascular pathologies.

The problem of cholesterol in chicken eggs

On the issue of the influence of cholesterol contained in eggs on the state of the cardiovascular system, two antagonistic camps were clearly identified:

Opponents of egg nutrition, citing scientific research, argue that an abundance of cholesterol increases the risk of sudden death and significantly worsens the condition of blood vessels. Moreover, only one egg per day is called a “dangerous dose”.

Supporters of egg nutrition also, with references to numerous, but more modern scientific studies, argue that one egg per day not only does not threaten the cardiovascular system, but also improves its condition. Even for risk groups (smokers, diabetics and people with heart problems), moderate consumption of eggs (1 pc. in 2-3 days) is quite acceptable.

In this debate, we will refer to the opinion of Anthony Komaroff, a physician from Harvard Medical School [5]. According to him, for most healthy people, one egg a day is normal and does not contribute to the development of heart disease or stroke.

Previously, both in medicine and among the people, it was believed that since there is cholesterol in the egg yolk, and cholesterol in the blood increases the risk of developing cardiovascular pathologies, it is logical that it is better to exclude eggs from the diet. However, since then, many studies have shown that the main cholesterol in our body is produced by the liver, and does not come directly from foods. The liver produces it from the processing of saturated and trans fats. One large chicken egg contains only about 1.5 g of saturated fat. At the same time, it has many useful components: lutein, zeaxanthin (for the eyes), choline (for the brain and nerves), vitamins A, B, D.

Evidence that the amount of cholesterol in an egg (if you eat one a day) is safe for most people comes from a large-scale study at Harvard Medical School that followed hundreds of thousands of people over several decades. They filled out questionnaires describing their diet and illnesses they had. According to the results, it turned out that the presence of eggs in the diet (no more than 1 per day) was not associated with a higher rate of development of heart disease or death from these diseases.

Anthony Komaroff noted at the same time that what is eaten with eggs is of great importance. Saturated fats from butter, cheese, bacon, sausages, sweets, or starchy foods increase cholesterol by a fraction more than 1 egg a day.

Based on this, apparently, it would be possible to determine the consumption rate of this product at the level of 1 egg per day for healthy active people. However, more cautious nutritionists call 2-3 eggs per week the optimal amount. For Russia, for example, the recommended norm is 260 pcs. in year. Below, in the relevant section, we review other studies supporting the cholesterol safety of the moderate egg diet.

Use in medicine

The enzyme lysozyme and shells are used as raw materials for the pharmaceutical industry.

Lysozyme is an antibacterial agent that is able to break down the cell walls of bacteria. In the food industry, it is known as food preservative E1105. And in medicine it is used as a local antiseptic, for example, as part of the preparations "Lizobakt", "Lysoprim Lor".

On the basis of the shell, some calcium preparations are prepared - for example, Calcid. Such funds are often additionally enriched with vitamins (including those that contribute to better absorption of calcium: D 3, C).

A number of vaccination bases are grown on chicken embryos, including vaccines against influenza, causative agents of typhus, yellow fever, and encephalitis. In immunology, the main egg protein, ovalbumin, is used to stimulate test allergic reactions.

In addition, chicken eggs are part of therapeutic diets No. 1 and No. 5. Diet No. 1 is prescribed in therapeutic recovery programs after acute gastritis, with stomach and duodenal ulcers. Diet number 5 is aimed at reducing the risks of digestive problems.

In folk medicine

Since ancient times, eggs in folk medicine have been used to treat diseases of the respiratory system, pathologies of the gastrointestinal tract, stop bleeding (including hemorrhoidal origin), and relieve burns. In the daily diet of men in their raw form, they were introduced to enhance potency.

• Respiratory organs .

In the handbook of traditional medicine, a case of an amazing healing of a patient from tuberculosis is described with the help of chicken yolks alone. The girl, who was refused by official medicine, daily drank up to fifty yolks of chicken eggs at the beginning of treatment and up to a hundred yolks at the end of treatment, which lasted 4 months. Although such therapy can be called extreme, it, according to the author of the reference book, led to a complete recovery of the patient.

But a much simpler folk way to treat tuberculosis also involves the use of raw yolks (2 pcs.), Which in the recipe are ground with butter (1 tbsp.), Honey (1 tbsp.) And starch (1 des. l.). This mixture is kept in the refrigerator, taking 1 tbsp. l. twice a day.

And to get rid of a slight cough, people often prepare a mixture, the recipe of which is generally more similar to the usual eggnog, which healthy people make for breakfast: a raw egg is beaten with sugar or honey and taken on an empty stomach, drinking plenty of water an hour later.

• Gastrointestinal tract .

Helicobacter pylori plays an active role in the appearance of gastritis, stomach ulcers, inflammation of the duodenum. To combat it, traditional healers recommend in the morning two hours before breakfast and be sure to drink a raw and preferably still warm chicken egg on an empty stomach.

This recommendation can be explained by the fact that crude protein reduces the acidity of gastric juice, which in the morning, before eating, is normally about 1.5-2 pH. Since bacteria remain active at 4-9 pH, they can be controlled by reducing the acidity of the environment. In addition, the egg enzyme lysozyme begins to act as an antibiotic on the bacterium, which only increases the effectiveness of the method.

If in the previous method it was enough just to drink one egg every morning, then for the treatment of dysentery, healers used a whole scheme of egg nutrition, designed for 6 days:

1-2 day: 12 pcs. - 2 pcs. every 2 hours.

3-4 day: 8 pcs. - 2 pcs. every 3 hours.

5-6 day: 4 pcs. - 2 pcs. in the morning and in the evening.

- **Treatment of hemorrhoids**

An egg-oil mixture is prepared to stop various kinds of bleeding, but as an example, we will give a recipe compiled for the treatment of hemorrhoids. The yolk of a boiled egg and a piece of butter of the same size are mixed together, and then copper sulfate is added to them (a pinch the size of a match head). The resulting product is stored in the refrigerator, but before going to bed 1 tsp. This mixture is rolled into a small cylindrical candle and inserted overnight into the anus. To obtain the effect, the procedure will need to be repeated several times.

egg infusions

There are egg infusions that traditional medicine positions as an ancient remedy for fighting cough, bronchitis, tuberculosis, and pneumonia. In one of the existing recipes, washed whole eggs (7 pcs.) Are placed on the bottom of a 3-liter jar and covered with gruel from lemons passed through a meat grinder (1.5 kg of citrus are ground together with the peel). The jar is closed with gauze and placed in the refrigerator for three days. Then its contents are transferred to another bowl, thoroughly kneaded and passed through a sieve. And in the end, all this is poured with a mixture of honey (1 l) and cognac (0.5 l).

You need to take the tincture three times a day, 20 minutes after eating, 1 tbsp. l. Store a 3-liter jar in the refrigerator, covering the neck with gauze. But usually such a remedy is prepared in smaller volumes in order to have time to drink it within 2 weeks until it deteriorates.

In the literature, there are variants of a similar recipe, in which whole eggs (3-4 each) and lemon "porridge" (3-4 cm) are stacked in layers until the vessel is completely filled. The jar is then kept in a dark place for 10 days, and after adding lemon, brandy, and collecting herbs (sage, licorice root, sweet clover), another 3 days in the cold. In such a recipe, cake is first used for treatment, which is brewed in a thermos at the rate of 3 tbsp. l per 0.5 l of boiling water to drink 150 ml before meals. And when the cake ends, go to the main drug. Healing liquid 1 tbsp. l. take three times a day 20 minutes before meals.

As a means to strengthen bone tissue in folk medicine, infusions of calcium-rich eggshells are used. Before use, the shell is first thoroughly washed, disinfected, ground into powder, and then the powder is poured with hot water to obtain a calcium infusion.

However, from a biochemical point of view, this is meaningless. Calcium carbonate, which forms the basis of the eggshell (it is 90-95% there), is present in a water-insoluble form, and an aqueous infusion will not work from it. But since such a powder dissolves the hydrochloric acid contained in the stomach well, it makes sense to eat a spoonful of the shell to compensate for calcium deficiency if, for some reason, numerous calcium preparations are not available. Only this will require additional effort: you will first need to thoroughly wash and then grind the shell. Although, for example, the famous Avicenna treated his patients in this way, giving them a pinch of ground eggshell per day.

In the mystical tradition, another truly folk method of treatment is practiced - rolling out spoilage and various diseases with an egg. This procedure has acquired numerous details over the centuries. On the territory of our country, from some point on, elements of pagan and Christian rituals have firmly merged in it, the choice of which varies in different regions and healing "schools". However, the purpose of the procedure is the same everywhere: as a result, the egg should take on all the negativity and illness of the patient.

in oriental medicine

Hen egg treatment is very common in Chinese medicine, often combined with vinegar and lemon. But to get the maximum effect, you need to review the rest of the diet for compliance with the rules of the Eastern worldview. Below are examples of some classic "egg" recipes for various diseases:

- **Prevention of atherosclerosis** . An egg (1 pc.) Is immersed in apple cider vinegar (180 ml) for 2 days. Then the softened shell is removed, and the contents are shaken and divided into 7 parts (for a weekly course). The remedy is taken in the morning with two parts of honey dissolved in water.
- **Ischemic disease** . Chicken eggs (2 pcs.) Are immersed in vinegar (400 ml), closed and cleaned in a dark place for 4 days. After that, the eggs are broken, and the contents are mixed and infused for another 3 days. The remedy is drunk in 1-2 tsp. three times a day for a week.
- **Hernia** . Eggs (2 pcs.) Are mixed with anise (20 g), overcooked with salt until a yellowish color appears. The remedy, together with a sip of rice vodka, is drunk before going to bed for 4 days.
- **Diabetes mellitus** . The contents of the eggs (5 pcs.) Are mixed with vinegar (150 ml) and infused in the refrigerator for a day and a half. Then honey and vinegar (150 ml each) are added to the mixture. The drug is taken twice a day for 1 tsp.
- **Male infertility** . Raw chicken eggs (2 pcs.) Are mixed with boiled milk (500 ml) and honey (2 tablespoons). Such a "cocktail" should be drunk every day for a month.

However, there are even more interesting ways to restore health in China. For several centuries, there has been a tradition in Zhejiang province to prepare a healing dish called tongzidan, which literally translates as "boy's egg" every new spring. Chicken eggs for him are placed in a vessel with the urine of immature boys (up to 10 years old), and then boiled for a whole day. In the process of cooking, the urine is first brought to a boil with eggs dipped into it, and then the shell is slightly pierced and left on low heat, adding liquid from time to time.

Since such a tradition is still alive throughout Zhejiang province (since 2008, the practice of cooking tongzidan has become an object of intangible cultural heritage), a lot of urine is needed for the dish. Therefore, in the educational institutions of the region, special buckets are put up, where healthy boys relieve themselves of a small need. The spring delicacy costs twice as much as an ordinary chicken egg, but there are more benefits from it. According to representatives of traditional Chinese medicine, tongzidan as a medicine can stop bleeding and reduce high fever.

In scientific research

The scientific community, which used to be mostly critical of the regular consumption of eggs due to the harm of cholesterol in the yolk, has rediscovered this product in the last decade and is revisiting previous restrictions and prohibitions.

Regular consumption of eggs reduces the risk of developing cardiovascular pathologies .

A group of Chinese and British scientists tried to establish a link between the consumption of eggs and cardiovascular pathologies (coronary heart disease, heart attack, ischemic and hemorrhagic hemorrhage - stroke). For this, during 2004-2008. The study involved 416,213 people aged 30 to 79 who had previously been free of cancer, cardiovascular disease, and diabetes. And then the scientists observed the subjects until the development of cardiovascular disease or death.

At the start of the study, 13.1% of participants reported eating eggs daily (mean 0.76 egg/day) and 9.1% reported eating eggs very rarely or not (0.29 egg/day). A subsequent analysis of the results showed that, compared with people who did not eat eggs, those who ate them every day had a lower risk of developing cardiovascular pathologies.

In particular, 1 egg per day reduced the risk of hemorrhagic stroke by 26%, death from hemorrhagic stroke by 28%, and death from other diseases of the cardiovascular system by 18%. It was also found that the introduction of eggs in the diet (5.32 eggs/week) reduced the risk of developing coronary heart disease by 12% compared to those who excluded eggs from the diet or ate them rarely (2.03 eggs/week) [6].

One egg a day reduces the risk of diabetes in middle-aged men .

Finnish scientists conducted a study of risk factors for coronary heart disease, which often occurs as a complication in type 2 diabetes. They concluded that eating an average of one egg per day was associated with a reduced risk of developing this type of diabetes in middle-aged men who were participants in the experiment.

To establish the link between the introduction of eggs in the daily diet and diabetes, scientists used a metabolomic approach (analysis at the molecular level). They were able to find out that in the blood of men with diabetes who ate eggs, there were lipid molecules that are present in blood samples of men without diabetes [7].

Eating eggs is likely to help lower blood pressure .

Canadian scientists in laboratory studies have found that some peptides (short fragments of proteins), which enzymes produce in the stomach and small intestine from boiled and fried eggs, act similarly to ACE inhibitors, which are prescribed to prevent heart disease and lower blood pressure. Fried eggs provided the greatest activity of ACE inhibitors. And although the study was conducted so far only in the laboratory without testing in humans, the identified dependence opens up new horizons for further research [8].

The yolk helps build muscle .

Usually, when building muscle, people go on a protein diet, so it's common practice to throw away the yolk and eat only the protein. But scientists at the University of Illinois say it's counterproductive. First, the yolk also has protein. Secondly, it contains components that are absent in the protein, but allow the body to enhance the incorporation of protein into the muscles.

In the study, 10 young people did strength training, after which some of them ate a whole egg, and some - an egg white containing 18 g of protein. In this experiment, special eggs were used, in which the amino acid leucine was specially labeled, so that scientists at any time (after eating the egg), taking blood and biopsy from the muscles, could understand how this amino acid was distributed.

Using these labeled eggs, the researchers were able to find that after both eating the whole egg and eating protein alone, about 60-70g of amino acids were available in the blood for new muscle protein synthesis. Usually, it is this indicator that gives reason to evaluate the potential benefits of a product for building muscle mass. However, when the scientists directly measured muscle protein synthesis, they found that a whole egg immediately after a workout led to increased synthesis compared to eating just protein.

At first, the researchers thought it was all about fat. In a whole egg, in addition to 18 g of protein, there are also about 17 g of fat. But when they began to add 17 g of fat to the protein, the intensity of protein synthesis remained unchanged. As a result, scientists came to the conclusion that there are some components in the whole egg that enhance synthesis and make muscle building more effective [9].

Fosvitin from egg yolk can slow down the synthesis of melanin, inhibiting skin cancer .

Egg yolk contains the protein fosvitin, which has the ability to bind metals. Scientists tested whether it would help stop the synthesis of melanin in cells in melanoma (skin cancer). The results showed that fosvitin reduced the activity of the enzyme tyrosinase, which catalyzes the synthesis of melanin. The addition of 50µ g / ml fosvitin to melanoma cells resulted in a 42% decrease in tyrosinase activity and a 17% decrease in melanin synthesis compared to the control group of cells (no addition of fosvitin).

This study suggests that fosvitin can be used as an inhibitor of melanin synthesis in the cosmetic industry and nutrition [10].

Weight regulation

The calorie content of the “yolk + protein” complex in the proportion in which they are present in a chicken egg (8:14, respectively) per 100 g is approximately 150-160 kcal. Moreover, the main share of calorie content falls on the yolk - it is 6-7 times more caloric than protein. In one medium raw egg that weighs 50 g (without shell) there will be about 75-80 kcal. In large eggs of the highest category weighing more than 75 g - about 120 kcal.

When including eggs in the diet, the method of preparation should also be considered. Depending on it, egg dishes can increase the calorie content by 2 or more times. In addition, the rate of assimilation of the product is also changing. So, for example, hard-boiled eggs will be digested more slowly than soft-boiled eggs: 3 and 1-2 hours, respectively.

There are no strict rules in egg diets, but athletes and bodybuilders, when losing weight, usually leave only protein in large quantities and, at the same time, either completely exclude the yolk from the diet or reduce it to a minimum (for example, mixing protein from 8 eggs and yolk from 1-2).

Egg diets outside of sports programs aimed at losing weight allow the use of a whole boiled egg for breakfast: from 1-2 to 7 pcs. in Week. But switching to a 7-day mono-diet is not recommended, since it is rather difficult to tolerate. It has low balance, and the effect of it is greatly exaggerated.

American scientists specifically compared how breakfast with an egg will be more effective than a breakfast with a yeast bagel (equal to an egg in terms of calories and energy value) in the fight against extra pounds in obese people during a low-calorie diet. Under the conditions of this diet, participants in the experiment who received breakfast with an egg showed a trend towards a greater decrease in waist

circumference (by 34%) than participants who ate a bagel breakfast. And in general, the first group lost weight 65% more effectively than the second. However, a concomitant low-calorie diet proved to be an important factor, since without it the difference between “egg” and “donut” blurred [11].

In cooking

Today, chicken eggs are present in culinary recipes in almost all countries of the world. They are fried, boiled, baked, pickled, salted and simply eaten raw. The constituent parts of the egg become elements of many recipes. Egg yolk is considered the basis of mayonnaise and many other sauces (for example, hot egg-and-butter "hollandaise"), and whipped egg white is the basis of biscuit dough, meringue and soufflé (if sugar is added to it).

Eggs make excellent dessert drinks and cocktails:

In America and Europe, sweet eggnog, a mixture of raw eggs and milk, is very popular during the Christmas period.

In our country, eggnog is better known among sweet egg drinks, to create which they take beaten egg white, sugar (salt) and add wine, honey, rum, juice or even cocoa to taste.

Italian sabayon (egg cream with wine, rum and cinnamon, whipped in a water bath) has become so popular that it is made in Argentina, Colombia, and Venezuela under their own names. There is a similar dessert in France. There, a dish in a water bath of yolks and wine is called shodo.

A beaten chicken egg is even mixed with beer. So, for example, British hot flip-type cocktails are prepared by pouring rum or other strong alcohol into them.

"Hard" and creamy egg desserts are no less common. Among the most famous are: French meringue (cake made from whipped proteins), Spanish “flan” (caramel pudding), Portuguese “barriga de freira” (yolk dessert created by nuns back in the 17th century), etc.

One of the most common egg dishes is the classic omelet. It is prepared by mixing (without beating) several eggs with the addition of spices. In some countries, milk is added to the resulting mixture. The mixture is fried in a pan, preheated and greased with butter, bringing the mass to a thickening. In this state, an omelette can be folded in half or an “envelope”, stuffed with vegetables, rice, meat and other products traditional for the national cuisine.

So, thanks to the peculiarities of cooking or the choice of filling, there appeared:

- Spanish tortilla in olive oil with potatoes,
- Italian frittata stuffed with cheese, vegetables and sausages, which is brought to full readiness already in the oven,
- Belarusian drochena, in which eggs are kneaded with yogurt or milk with the addition of flour or cereals, etc.

Today, omelettes are also very popular in Japan. In the middle of the 20th century, the famous Japanese dish appeared - tamagoyaki, which is a spicy and sweet omelette, very fond of Japanese children. Tamagoyaki is fried in special rectangular pans (makyakinabe). The egg in this recipe is first rolled into a thin layer, and then rolled into a rectangular roll with chopsticks. But in recent years, tamagoyaki in Japan has had other competing egg-based dishes:

- usuyaki-tamago from even thinner layers than tamagoyaki,
- similar to our iri-tamago scrambled eggs,

- consisting of thin threads of kinsi-tamago.

But perhaps the most exotic approach to egg cooking is China. We have already mentioned the tongzidan dish - a chicken egg that is boiled all day in the urine of healthy immature boys. But this is not the only egg delicacy in Chinese cuisine.

A very popular snack in the PRC and neighboring countries of Southeast Asia is called the “centenary egg” (a variant of the name is “thousand-year-old egg”). There are several regional recipes, but they all have one thing in common: to create a snack, a chicken (or duck) egg is immersed in a special alkaline mixture, and “the vessel is sealed so as to exclude air. Traditionally, an alkaline environment was created with a mixture of lime, clay, ash, tea and salt wrapped in a cocoon of straw and rice husks. Then this cocoon was buried in the ground for a period of 0.5 to 4 months. In modern conditions, sodium hydroxide is more often used as an alkaline coating and polymer films as a sealed container.

During the time spent in a sealed state, the protein and yolk change chemical and physical characteristics:

- the pH level rises to 9-12 (for comparison, it is 9-10 for fatty hand soap, and 11.5 for ammonia),
- the protein changes color to dark brown, becoming elastic,
- the yolk turns into a creamy state, starts to smell like ammonia and darkens very much, sometimes turning almost black,
- the surface of an egg without a shell can be covered with crystals resembling frost or a coniferous branch, which caused another alternative name for the snack - "pine eggs".

Such a dish is served, as a rule, without additional processing, simply cutting them into slices or crumbling into salads. Often, the appetizer is seasoned with oyster or soy sauce.

In cosmetology

In home cosmetology, chicken eggs are used very widely, being part of dozens of face and hair masks, shampoos and mousses.

Protein is introduced into masks to shrink pores and cleanse the skin. After the raw protein dries, both dirt and excess sebum are removed along with the film.

The yolk is used as a nourishing agent with a moisturizing effect, it is usually included in the care programs for dry and normal skin.

Manufacturers of skincare cosmetics have also begun to actively use the chicken egg. Some companies produce whole series of cosmetic products on an egg basis. For example, the Korean brand Too Cool For School released a line in which they collected egg masks for narrowing pores, moisturizing the skin, an emollient face cream, a cleansing hair mousse mask, and even an egg oil for the body.

Dangerous properties and contraindications

The danger of chicken eggs for health is associated with three main factors: an allergic reaction, the effects of cholesterol on the body and the risk of salmonellosis.

Allergy to eggs is considered one of the most common in 2-3-month-old children. By the age of 4-5 or a little later, it most often disappears and in adults it is already quite rare. The ovomucoid contained in the protein, also known as the f233 allergen, causes allergies. But if a reaction to chicken protein is

detected, in order to exclude cross-reactivity, both the yolk and eggs of other birds can be completely excluded from the diet.

Cholesterol from chicken eggs, when consumed in moderation, will not harm a healthy person. But people with damaged vascular walls and an increased risk of developing atherosclerosis, suffering from diabetes, acute pancreatitis, diseases of the liver and gallbladder, do not recommend eating fried eggs at all, and the number of boiled eggs is significantly reduced. In this case, special emphasis is placed on the exclusion of the yolk from the diet.

There are no fresh salmonella eggs inside. Normally, this bacterium should not be on the surface of the egg. But chicken can be infected with salmonellosis, the droppings of which sometimes fall on the shell. Gradually, the bacteria begin to penetrate the natural barrier and infect the contents of the egg. This process can take from several hours to 5 days. If the shell is damaged (cracks on the surface), infection occurs much faster.

Low temperatures and even freezing do not kill this bacterium, but rather preserve it for a long time (for a year or more). But high temperatures are detrimental to salmonella, but to destroy the microbe, the whole egg should be fried or boiled. That is, scrambled eggs with liquid yolk remains a potentially dangerous product, although the risk of infection is not very high, given that there is bacteriological control in poultry farms. However, to reduce the risk, it is better to take fresh eggs and wash the shell with soap before breaking it so that the bacterium (if it was still on the egg) does not get into the pan from the surface of the shell.

It is not advisable to wash the eggs in advance (for example, before putting them in the refrigerator), since the protective layer is washed off the shell and the shelf life of such eggs is drastically reduced. But before cooking each egg, you still need to wash it with warm water.

In addition, over time, even an initially well-protected whole egg naturally begins to lose the antibacterial enzyme lysozyme, so its protein and yolk become more vulnerable to the growth of various bacteria and molds that penetrate through the pores of the shell. And this means that fresh eggs are not only healthier, but also safer.

Selection and storage

In addition to the fact that the eggs must be clean - without traces of droppings and feathers - they must also not have foreign odors. A fishy aroma, even with an outwardly normal egg, can indicate contamination of the product. However, it is not always possible to catch the smell without breaking the eggs. Therefore, an important guideline for a buyer who purchases eggs in a store (and not from housewives "from hands") remains the marking that is applied at the final stage of egg selection at poultry farms and on the general packaging, and on each individual egg (on the side or at the blunt end). According to the state standard, the division into 3 classes of eggs intended for domestic sales is accepted (the export classes of eggs "extra", "A" and "B" are separately divided):

Dietary are designated by the letter "D" - the highest class for the domestic consumer. Such eggs should be stored for no more than 7 days (starting from the day following the marking) in a temperature range of 0-20 C.

Canteens are designated with the letter "C" - eggs are transferred to this class, the implementation period of which does not exceed 25 days under the same storage conditions.

Food chilled - a class of eggs that were stored at a low temperature of -2-0 C for no more than 90 days.

There is also a class of eggs intended for industrial processing, but such a product does not get into stores. A similar (though not always identical) class division persisted in some other countries of the post-Soviet space.

In addition, there is an additional division by weight of eggs indicating one of 5 categories. Ukrainian producers use Latin letters for marking eggs for export, as in the dimensional grid of clothes. For the domestic market - just like Russian and CIS manufacturers - an alphanumeric designation. Moreover, if the largest (heaviest) eggs according to the Ukrainian state standard are considered "Choice", then in Russia these are eggs of the "Highest" category, although both are marked with the same letter "B". The requirements for categories by the criterion of the mass of one egg can be presented in the following table:

Ukraine (DSTU 5028:2008)				Russia (GOST 31654-2012)		
Weight, g	Category	Marking	Export	Weight, g	Category	Marking
73+	selected	AT	XL	75+	Higher	AT
63-72.9	Higher	O	L	65-74.9	selected	O
53-62.9	First	one	M	55-64.9	First	one
45-52.9	Second	2	S	45-54.9	Second	2
35-44.9	Small*	3		35-44.9	Third	3

*for table and chilled

The standard by which the eggs have been sorted and labeled must be written on the packaging. On dietary eggs (as opposed to table and chilled), in addition to the group and category, the date and month of egg laying are also indicated. The name of the farm in which the egg was collected is also applied to the shell.

With domestic eggs devoid of any markings, in matters of the date of laying and storage conditions of the product, you usually have to take the word of the seller. But there are a few tricks that help the buyer determine the quality of the goods on the spot.

Transillumination .

This method involves transilluminating the shell with a flashlight or ovoscope. Modern ovoscopes are more like flashlights, but the classic model looks like a "box" with a lamp inside and forms to hold the egg - such are still found in some deli and grocers. First of all, transillumination will show the size of the air chamber, which should not be in a "warm" freshly laid egg at all. In a lying egg, an air bubble begins to form between the shell membranes of the blunt end. It appears due to the evaporation of water through the pores of the shell. The longer the egg is stored, the larger the bubble.

Diet eggs (up to a week old) have a chamber no larger than 4 mm. In eggs aged 1.5-2.5, it is about 6-7 mm. And in an egg that has lain for 3-4 weeks, the air chamber can increase to 1 cm. Moreover, if storage conditions are violated, it will also begin to "wander" around the egg, although normally it should remain at the blunt end even when turned over.

In addition to the air bubble with the help of translucence, you can notice other flaws, in the presence of which it is better to refuse to buy:

- large, dark yolk, displaced or even "stuck" to the shell,
- too mobile yolk, which occurs due to the liquefaction of the protein over time,
- mixed (spread) protein and yolk, which occurs due to damage to the yolk membrane,
- blood clots and any dark spots (red, gray) that may indicate a fungal disease.

It is also not advised to buy multi-yolk eggs, as this is considered a violation of the standard.

Immersion in water .

For testing, water is poured into a transparent container and the egg is lowered into it. The larger the air cavity under the shell, the more the egg will “want” to float. Therefore, by the position of the egg and by the angle of inclination, one can approximately determine its age:

- horizontally at the bottom - fresh egg (up to 3 days),
- the sharp end is at the bottom, and the blunt one rises up at an angle of 30-60 ° - 7-14 days,
- the sharp end is at the bottom, and the blunt one is located vertically (90 ° to the bottom plane) - about 3 weeks,
- the egg rises to the surface or the blunt end is lower than the sharp one - the terms and / or storage conditions are violated.

The first method is more suitable when choosing eggs with a white shell, because the contents of brown ones (due to the dark color of the shell) are less visible. But the peculiarity is that in the markets at the hostesses, buyers often look for brown eggs, considering them better and more useful than white ones.

This is a delusion, and it often coexists with another erroneous opinion that the color of the shell depends on the color of the bird's plumage. To deal with this, let's take a closer look at how brown chicken eggs differ from white ones.

The difference between white and brown eggs

From a consumer point of view, there is no difference between eggs with shells of different colors. The nutritional value, physical and chemical properties and, accordingly, the therapeutic effect of such eggs, all other things being equal, are the same. The opinion that brown-shelled eggs are more useful should be attributed, rather, to the peculiarities of psychological perception, which may have different reasons. For example, it is often believed that the brown color of the shell is a sign that the egg was laid by a domestic chicken, which was fed better and better, but this is not the case either.

The color of the shell is due to the genetic characteristics of the bird. In some breeds and crosses of chickens, the eggs will be white, in others they will be brown (with various shades), in others they will be blue or green (as, for example, in birds of the Araucan breed). Neither the nutrition of the laying hens nor the color of the plumage affect the color of the shell. The only thing that matters is belonging to one or another breed or cross.

Chicken crosses are interbreed hybrids that are bred to improve the consumer characteristics of the product - eggs and / or meat -, and only for this (without getting offspring from birds). Accordingly, in order to improve egg production, geneticists bred special crosses of chickens of the egg direction, and to increase the share of chicken meat, special poultry of the meat direction. There are also combined (meat and egg) crosses, thanks to which, mainly, brown eggs appear on store shelves.

Modern crosses of the egg direction lay exclusively white-shelled eggs, because they were all bred from a breed called Leggorn, which is genetically inherent in laying white eggs. The hens of this breed themselves can wear both white and brown plumage, but their eggs are still white.

But all modern crosses of the combined and meat direction give brown eggs (from dark brown to creamy beige). And also - regardless of the color of plumage. For example, white plymouth rock birds

lay light brown eggs. Although most chicken hybrids of these directions were bred on the basis of New Hampshire, red and white Rhode Island breeds.

Thus, if eggs of chickens of an egg direction turn out to be in the store, then their shell will be white. If combined or meat direction, then the shell will be brown. (Although the "meat" hybrids of chickens are bred, first of all, for the sake of meat). Why, then, in the popular mind, a brown egg is often associated with a homemade one? This can be explained.

For the preparation of eggs in poultry farms, they often prefer to keep birds of egg crosses, that is, laying white eggs (therefore, there are more of them in stores). Such chickens, as the name of the direction implies, are distinguished by the best egg production. The most productive hybrids carry about 300 eggs in the first year, but they are not able to maintain high productivity further, and they are usually slaughtered.

Purebred birds lay one and a half to two times less often (up to 200 eggs per year), but they do not lose egg production for several years. Therefore, in households and on mini-farms, purebred chickens (rather than crosses) are more often kept, and often those breeds that genetically tend to lay eggs with colored shells. This freedom of breed choice increases the frequency of brown eggs in households. And when you consider that homemade food is considered healthier for chicken, it all works together to improve the reputation of brown eggs.

The difference between store-bought and homemade eggs

The difference between domestic eggs and shop eggs is not only that laying hens at conveyor-type poultry farms are not fertilized by a rooster and carry sterile eggs from which a chick cannot hatch. Poultry, unlike chickens in poultry farms, tends to lead a free-living lifestyle, eating a varied and usually natural diet, which is believed to ultimately affect the quality of the eggs. Some egg-eaters even claim that a homemade egg smells like "health" because of this.

However, it is difficult for the consumer to check what the hostess actually feeds her layers, and, all the more, it is difficult to compare with the composition of the feed at poultry farms. As a rule, in factories, the feeding process is a multi-stage program focused on the needs of a particular breed or hybrid. The composition of the feed may include wheat, corn, alfalfa, nutritional supplements that promote digestion, processed substandard product from the same factory, etc.

Among other things, elements that affect the color of the yolk are often added to the feed. Despite the fact that this measure increases the final cost of the product, it also increases the consumer attractiveness of eggs with an orange yolk, because the rich color "hints" to many buyers of a higher content of nutrients. The only problem is that domestic chickens, in the same way and for the same purpose, can be fed with food additives, from which both the color and the consistency of the yolk change. Therefore, the buyer, even breaking an egg, is unlikely to be able to objectively choose which is better: homemade or store-bought.

Storage

In the first week after laying, chicken eggs retain almost all of their valuable qualities and generally age very slowly. But then the rate of biochemical and morphological changes in the egg increases rather quickly, so it is better to immediately create the most favorable storage conditions for this product.

Chicken eggs should be kept in the refrigerator in compartments specially designed for this. But to prolong the term, it is better to turn them over with the sharp end down. Then they can lie up to 3 weeks, retaining most of the consumer qualities and healing properties.

If the refrigerator is not available for some reason, then eggs are better stored in the heat, the shells of which are rubbed with sunflower oil or fat rendered from lard (lard). After applying oily protection, the eggs are wrapped in paper, placed in a ventilated container (for example, a basket) and hidden in the coolest possible place. At the same time, eggs should be isolated from strongly smelling products so that the porous shell does not absorb odors.

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Chicken egg - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of a chicken egg and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of chicken eggs in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of a chicken egg on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application .



Rosehip (lat. Rōsa)

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Abstract. The article discusses the main properties of wild rose and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of wild rose in various types of medicine and the effectiveness of its use in various diseases are considered. Potentially adverse effects of wild rose on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: wild rose, benefit, harm, beneficial properties, contraindications

Useful properties of wild rose

Table 1. Chemical composition of wild rose (according to [Food+](#)).

Main substances (g / 100 g):	Fruit wild rose [1]
Water	58.66
Carbohydrates	38.22

Squirrels	1.6
Alimentary fiber	24.1
Sugar	2.58
Fats	0.34
Calories (kcal)	162
Minerals (mg/100 g):	
Phosphorus	61
Calcium	169
Potassium	429
Sodium	four
Magnesium	69
Iron	1.06
Zinc	0.25
Copper	0.113
Manganese	1.02
Vitamins (mg/100 g):	
Vitamin C	426
Vitamin B2	0.166
Vitamin A	1.3
Vitamin B6	0.076
Vitamin B1	0.016
Vitamin PP	1.3
Vitamin E	5.84

The table provides data on wild rose hips growing in the Great Plains (piedmont plateau in the USA and Canada), which is very rich in vitamins P, E, K, flavonoids, tannins, pectins, carotenoids. Among the vitamin group, vitamin C stands out especially. According to this indicator, rose hips are 50 times more than lemon, and 10 times more than blackcurrant.

The wild roses common in our country are May, needle, Begger, Dahurian, Fedchenko, and others, which also have a rich vitamin composition and are used as medicinal raw materials, however, not all plant species (and there are more than 350 of them) are equally useful as a source of valuable substances. Red- and white-flowered species contain a lot of ascorbic acid (sometimes more than 1000 mg per 100 g), and in pink- and especially in yellow-flowered wild roses it is much less (although these species are richer in tannins).

In addition, the concentration of valuable vitamins depends on the place where the shrub grows. Romanian scientists in their study [2] compared 6 types of wild rose, collected at different heights. It turned out that the highest content of ascorbic acid was found in the fruit pulp of bushes growing at the level of 807-830 meters. Even the species with the least amount of vitamin C, taken from the highlands, contained twice as much ascorbic acid as the same species growing lower.

Healing properties of wild rose

In 2018, a study was published [3], which examined the traditional use of rose hips and its pharmacological profile based on previously written scientific papers. From the above materials, it follows that at different times, scientists discovered anti-cancer, antioxidant, anti-inflammatory effects of berries, the extract of which also had a therapeutic effect on arthritis. In a number of other studies, it was found that rose hips protect the liver, kidneys, cardiovascular and nervous systems, and that it is effective against the H. Pylori bacterium, which is involved in the development of peptic ulcer.

And for the first time, the healing properties of wild rose began to be used even by ancient, and after them by medieval healers. The famous Arab physician Avicenna a thousand years ago treated inflammation of the eyes, gums and dental diseases with the oil of the plant. European medieval physicians with wine-infused flower petals relieved gastrointestinal problems and women's diseases. A mixture with honey dissolved in water helped them relieve high temperatures in patients, and vinegar formulations were used to treat infected wounds.

As a wound healing agent, rose hips and its petals were also used in Russian-Turkish wars, starting at least from the 17th century. Dressings were impregnated with water tinctures of the petals, wounds were treated with a decoction of the fruits to prevent gangrene, and "svoroborin molasses" ("rose hips" were called in the old days) were drunk to quickly restore strength after injury and fever.

The effectiveness of wild rose here is explained by the cumulative effect of its constituent components. Isoflavonoids and kaempferol have a diuretic effect, rutin in combination with vitamin P has a capillary-strengthening effect, and quercetin has a pronounced hemostatic effect. Tannins, contained not only in fruits, but also in other parts of the plant, demonstrate their bactericidal, anti-inflammatory and astringent properties.

Today, French rosehip petals, which also exhibit the above properties, are included in the pharmacopeia of a number of countries and can be included in the treatment of atherosclerosis, hypertension, ulcers, gastritis, colitis, dysentery.

Use in traditional medicine

Rosehip is widely used both as a raw material for the production of ascorbic acid, and as the basis of various medicines:

Means such as "Holosas", "Cholemax", "Holos" are an aqueous extract of rose hips. They are prescribed as a choleric agent for inflammation of the liver and gallbladder (excluding forms of cholecystitis with the formation of stones).

"Rozanol" based on rosehip oil has a choleric, but also bactericidal and antispasmodic effect.

From berry meal rich in tocopherols and carotenoids (waste of fruit processing), an oil solution "Carotolin" was created, designed to normalize tissue metabolism in skin lesions, eczema, trophic ulcers.

The drug Setarud (IMOD™), which, in addition to dog rose extract, includes extracts of common tansy and stinging nettle, is declared by the manufacturer as an immunomodulatory agent. There is evidence of the use of this drug in the treatment of HIV-infected [4].

Rosehip syrup can be prescribed to improve appetite and to prevent beriberi.

Rose hips are included in the composition of the anti-asthma mixture (according to Traskov), which is intended for the treatment of bronchial asthma.

The use of wild rose in folk medicine

Rosehip can be called one of the most popular natural ingredients used in folk medicine both on its own and in combination with other components. In ancient times, it was believed that even the aroma of rose hips can sharpen the senses, heal the "cold nerves", relieve the heaviness of the heart and "hot" the brain. To get rid of a headache, rosehip preparations were smeared on the forehead. But if the

source of pain was located in the ear, then with the help of the fruits of the plant they also fought with “ear worms” and ringing in the head.

In modern folk medicine, the tradition has been preserved to treat heart diseases with rose hips and petals of its color. But, in general, the range of applications of various parts of this plant is very wide:

- fruit decoctions are in demand as a choleric and diaphoretic, prescribed in combination with honey for colds, hypertension, liver diseases;
- jam and syrups from rosehip petals are taken as a sedative;
- a decoction of pathological formations that affect the plant (they are called galls), are included in the treatment of stomach ulcers and duodenal ulcers, pulmonary tuberculosis, malaria;
- crushed plant seeds mixed with alum are applied to wounds for quick healing;
- a resinous substance obtained from burnt rosehip branches, used in the treatment of psoriasis;
- boiled branches and leaves of the plant are prescribed by healers for dysentery and pain in the stomach, typhoid, scarlet fever, inflammation of the kidneys, pulmonary tuberculosis;
- A decoction of the roots is considered a good diuretic and prophylactic that prevents the formation of stones in the bladder.

The beneficial properties of rose hips are manifested mainly due to polyphenols and vitamin C in the composition. Even the leaves contain up to one and a half percent ascorbic acid. This is due, in particular, to the antioxidant and anti-inflammatory effects. Moreover, both these and other healing manifestations are expressed so vividly that they have become entrenched in the traditional recipes of many peoples of the world.

In France, gallic rosehip petals are used to prepare antihelminthic drugs, remedies for hemorrhoids and diarrhea.

In Bulgaria, the petals of the Damascus rose (in ancient times, derived from the Gallic and musky rose hips) are used to treat not only diarrhea and inflammation of the gastrointestinal tract, but also sore throats and lesions of the mucous eyes.

In Germany and Poland, the fruits of the plant are used for diseases of the bladder and kidneys.

In Russian folk medicine, petal preparations are drunk for pulmonary tuberculosis, cholesterol blockage of blood vessels, and neurasthenia. The throat and mouth cavity are also rinsed with this healing liquid, ulcers and erysipelas are sprinkled with the powder of crushed petals, and the dressing material is impregnated with dog rose petal decoction to stop bleeding.

In Central Asia, petal jam is eaten to improve the functioning of the heart and nervous system.

On the territory of Ukraine and Belarus, radiculitis, rheumatism and bloody diarrhea are treated with a decoction of branches.

In folk medicine of the Yakuts, a diuretic is prepared from a decoction of the leaves of the wild rose, and a remedy for malaria from a decoction of leafy stems.

Some indigenous tribes of North America treat throat diseases with a decoction of the roots of the Nootkan rosehip.

In general, rosehip-based products in folk medicine most often restore the functioning of the digestive organs, stop bleeding, stimulate the secretory function of the thyroid gland and adrenal glands, relieve inflammation of the tonsils, stop vomiting and relieve hiccups. It is believed that daily consumption of

rose hips (at a dosage of approximately 2-2.5 g), according to popular recipes, should increase potency and delay aging.

How to brew wild rose correctly

Perhaps the main advantage of wild rose over other plants is the record content of vitamin C in its fruits. Of the European plants, only the spring primrose is ahead of the wild rose in this indicator. Since vitamin C is lost during prolonged exposure to high temperatures, the problem arises of how to properly brew rose hips in order to retain the maximum amount of L-ascorbic acid (biologically active isomer) in the resulting broth.

In the absence of oxygen, L-ascorbic acid is able to withstand heating in excess of 100°C without being destroyed. That is, if you pay attention only to the temperature, then one of the traditional methods of sufficiently long (15-20 minutes) boiling of rose hips, followed by infusion for up to 4 days, should not greatly harm ascorbic acid.

However, in this method, at least, the degree of destructive effect of oxygen is not taken into account. It is not for nothing that many herbalists advise not to grind the wild rose before brewing, believing that in order to reduce the intensity of oxidation, it is more useful to simply crush it, pierce the protective skin several times with a toothpick, or cut the fruit in half. For the same reason, herbalists believe that it is more correct to brew wild rose in a closed thermos. In addition, a number of additional factors should be taken into account that complicate the procedure for brewing rose hips.

In one of the projects [5], scientists evaluated the degree and rate of destruction of vitamin C in water of different temperatures and at different values of the measure of acidity (pH from 5 to 6.5). During the experiment, the researchers maintained a constant temperature at around 60, 70, 80 and 90 degrees Celsius in a 30-minute interval. As a result, it was found that several parameters are important at once:

temperature . Regardless of the pH value, at 90-degree heating, 15-20% of vitamin C was lost after 10 minutes. During the same period of time at 60-degree heating of water, the loss of vitamin C was no more than 5%.

pH level . Ascorbic acid is more susceptible to thermal degradation at higher pH values. At a water pH of 5, approximately 5% of vitamin C was lost in 20 minutes when heated to 60 C , and at a pH of 6.5, more than 60% was lost in the same time at the same heating temperature.

Heating duration . For half an hour of the procedure at all temperatures and pH values tested in the experiment, the content of ascorbic acid decreased by more than 50%. At the same time, the higher the temperature and pH, the greater were the losses, up to the almost complete disappearance of the vitamin. Overall, the results showed that, other things being equal, high temperature was less damaging to vitamin C than longer steeping times.

But this is not all the difficulties, since the proximity of the vitamin to other substances also affects the pace of destructive processes. On the idea of slowing down the breakdown of ascorbic acid with the help of tea phenols, a phytotherapeutic tradition is based on brewing rose hips along with tea leaves. It is believed that the loss of ascorbic acid is accelerated by iron and copper ions. However, when they interact with tea phenol (rather than vitamin C), the rate of loss of ascorbic acid decreases. Brewing such tea-rosehip drinks is a popular and common practice, but it should be borne in mind that tea caffeine interferes with the absorption of vitamin C in the body. Therefore, "winning" at one stage of the process turns into a "loss" at another.

If you try to take into account all the listed conditions as much as possible, then we can talk about the two most effective ways of brewing rose hips. In both cases, 1 part of the fruit of the plant is taken per 10 parts of water. (If the decoction is prepared for external use, the proportion of raw materials increases by 2-3 times). Before you put the wild rose in a thermos, the berries need to be washed, cleaned of the "hairs" of the sepals, crushed with your fingers and pierced several times with a toothpick. Dried rose hips can be crushed into small fractions. It is better to take a thermos with a glass flask, and water with a low pH level. Further, in the first case, the wild rose is filled with water at 90 C for literally 10-15 minutes. In the second - 50-60-degree water for 20-30 minutes. Regardless of the method, the thermos closes tightly, and the broth is drunk immediately after preparation.

in oriental medicine

In Tibet, India, China, rose hips are used to treat stomach ulcers, diseases of the liver, and excretory systems (kidneys, bladder). Tibetans also use fruit-based drugs to fight atherosclerosis, neurasthenia and pulmonary tuberculosis, and the Chinese use a decoction and powder of plant roots to remove parasites and activate the digestive tract.

Under the name mei-kuei-gua in the collection of Chinese medicinal herbs, wrinkled rosehip is mentioned, which affects the liver and spleen, promoting active blood circulation. A decoction of its petals in traditional medicine is used to stop hematemesis, treat blood diseases, apply lotions soaked in mei kuei gua to dissolve purulent abscesses. In addition, medicinal tea is brewed from the petals and mei-kuei-lu ("Pink dew") tincture is made.

In scientific research

American scientists have explored the potential of rose hips in terms of fighting breast cancer, or rather, with its type as "triple negative". This type of cancer is very difficult to treat because the cells in the tumor lack the three receptors that drugs normally target. And even when in remission, patients with this disease have more relapses and a higher mortality rate compared to other types of breast cancer.

The scientists conducted a test-tube study on triple-negative breast cancer cells. As a treatment, they used rosehip extract in various concentrations. The highest dose (1.0 mg/ml) reduced the proliferation of pathological cells by 50% and their degree of motility by 25 to 45%. A decrease in concentration led to a decrease in the effectiveness of therapy. Additional experiments made it possible to reveal the mechanism of action of the rosehip extract. It turned out that it reduces the amount of two enzymes that are responsible for the growth of disease-causing cells in this type of breast cancer.

The extract also enhanced the ability of Doxorubicin (a chemotherapy drug commonly used for breast cancer) to inhibit proliferation and reduce cell motility. It is believed that rose hips may be effective in the fight against prostate cancer, but studies are needed to obtain confirmation [6].

In experiments on mice, rosehip powder has been shown to prevent the worsening of obesity and slow the progression of type 2 diabetes by acting even at the stage of pre-diabetes, when glucose intolerance occurs. In addition, the powder significantly influenced the reduction of the level of "bad" cholesterol in the blood.

Based on this, Swedish scientists undertook to test the effect of rose hips on obese people. The randomized, double-blind study included 31 obese patients with normal glucose tolerance. They took the rosehip powder drink for 6 weeks and then compared their weight, glucose tolerance, blood

pressure, blood fat levels and inflammatory markers with those of control patients who did not drink the drink.

The results of the study demonstrated that the rosehip drink group had a significant reduction in systolic (upper) blood pressure and total plasma cholesterol levels. The risk of developing cardiovascular diseases on the Reynolds scale (which takes into account many factors: gender, age, previous diseases, the fact of smoking, etc.) has also decreased. At the same time, indicators of weight, diastolic (lower) blood pressure, glucose tolerance, high-density ("good") cholesterol, triglycerides, and inflammatory markers did not differ in representatives of both groups.

Thus, the researchers concluded that daily consumption of 40 g of rosehip powder for 6 weeks can significantly reduce the risk of cardiovascular disease in obese people by lowering upper blood pressure and plasma cholesterol levels.

As for the differences in the results of studies in mice and humans, scientists explain this by the difference in dosages. Rosehip powder made up almost 30% of the rodents' diet, while humans took only 40 g/day. It was the high dosage that could cause an improvement in the lipid profile, weight loss, etc. in mice. [7]

Hyben Vital[®]), made from the seeds and skins of the fruit, has been studied in a randomized, double-blind study on skin cell aging and wrinkling. The experiment involved 34 people aged 35 to 65 years with wrinkles on the face of the "crow's feet" type. The effect of rosehip for 8 weeks was compared with the effect of a well-known anti-wrinkle agent (astaxanthin).

Using a special Visioscan camera (a device that detects changes in skin texture), a corneometer (skin moisture meter) and a cutometer (a device that measures skin elasticity), scientists obtained information about the relevant parameters - wrinkles, skin hydration level and elasticity, at the start, and then 4 and 8 weeks after the start of the experiment.

Also, all participants donated blood to determine the lifespan of the cells. Scientists studied blood samples for 5 weeks and drew conclusions based on the rate of destruction of red blood cells, at which hemoglobin enters the blood plasma.

After the end of the study, patients from both groups showed significant improvements in the condition of the skin in all respects (wrinkles, moisture, elasticity). Blood samples showed that rosehip powder increased the lifespan of red blood cells. Also in the questionnaires, all participants expressed satisfaction with the effect they received.

The results allowed scientists to conclude that the use of rosehip powder (Hyben Vital[®]) improves skin condition during aging. The discovered stabilizing effect of this drug on erythrocyte membranes may help in the future to increase the lifespan of cells and thus slow down skin aging [8].

Weight regulation

Rosehip can show its potential in programs aimed at reducing excess weight. First, Japanese scientists conducted experiments on mice, which showed that the extract of these berries is able to inhibit weight gain and reduce the amount of visceral fat. After that, encouraging results prompted researchers to study the effect of the extract on the human body.

The 12-week experiment involved 32 people (16 men and 16 women) in the stage of pre-obesity with a body mass index of 25-30. They were divided into 2 groups, one of which was given a daily placebo tablet, and the other was given a tablet that contained 100 mg of rosehip extract. Scientists did not interfere in any way with the diet of patients, but took it into account when summing up. Before,

during and after the experiment, the participants were measured the amount of visceral fat and the total percentage of body fat. Weight and body mass index were also taken into account.

The results showed that total fat percentage, visceral fat, weight and body mass index decreased significantly in the group of people who took rosehip extract. Moreover, a decrease was observed, both in relation to the control group (taking a placebo), and in relation to their own indicators at the time of the start of the experiment. In addition, scientists noted a decrease in the amount of subcutaneous fat on the abdomen. It is important that no side effects from the drug were detected during the study [9].

In cooking

Rose hips today have become the basis for jam, marmalade, compotes and jelly, sweets and marmalade, sweet puree, kvass, syrup. Jam is also made from the petals of some species (cinnamon rosehip, wrinkled). But in general, there are much more plant species that have culinary significance. The species processed for culinary purposes include prickly dog rose, Daurian, apple, shield-bearing, Alberta, Begger, Fedchenko, Aitchison, etc. Rose hips can also be served raw.

From rose hips and 11 types of herbs in 1953 in Yugoslavia, the popular carbonated soft drink "Cockta" was created, which for some time successfully competed in the country with Coca-Cola. The recipe for the drink was so successful that in Poland, under the similar name "Polo Cockta", they began to produce a similar product. After the separation of Slovenia into a separate state, Cockta soda continued to be produced, and in 2019 its new series without sugar was even released.

In addition, rose hips have found their use in alcoholic beverages. A fragrant liqueur is made from flower petals, and adding to wine allows you to get a specific spicy taste. Also, based on the fruits, leaves, nuts and flowers of the plant, depending on the species, tea and coffee surrogates are obtained.

In cosmetology

Rosehip in cosmetology is an almost universal product. Skin care products from dozens of cosmetic brands include rosehip in natural shampoos, cleansing oils, protective creams, moisturizing lotions, body scrubs, peeling socks, anti-wrinkle products and lifting masks. In combination with other active ingredients, rosehip extracts and extracts offer a solution to almost any cosmetic problem.

But the cosmetic potential of wild rose has been used since time immemorial. A rejuvenating decoction for washing was prepared from rosehip flower oils in ancient Egypt. In the ancient world, they were included in the composition of perfumes, added to the water when taking a bath to soften the skin. And rubbing the flower petals of the plant after bath procedures was practiced to eliminate the smell of sweat. Since that time, rosehip juice has also been used as an effective sunscreen.

Dangerous properties and contraindications

Instructions for rosehip preparations as contraindications indicate that a person has stomach and duodenal ulcers (in the acute phase), gastritis (due to increased stomach acidity), as well as individual allergic reactions.

Since rose hips increase blood clotting, its uncontrolled use can create prerequisites for problems of the cardiovascular system. And the ability of the fruits of the plant to stimulate the production of bile can lead to an exacerbation of cholelithiasis. People who take drugs to reduce pressure should also be more careful with medicinal berries, since the combination with rose hips can enhance the effect of the drug.

Selection and storage

When buying rose hips, experts recommend choosing cultivated rose hips, which are considered both healthier and tastier. The main difference from the fruits of a wild plant is the size. Wild is usually noticeably smaller, although 2 varietal groups can be distinguished among cultivated plants:

- with larger fruits from 4 g, which look like apples covered with thick skin,
- with small, up to 4 g, fruits with thin skin.

Which rosehip to choose, the buyer usually decides based on their own preferences, but it should be borne in mind that excellent jam is obtained from the fruits of the first group, and dried blanks from the fruits of the second.

Buyers are advised to pay attention to the shape of the "berry". The oval elongated shape is characteristic of varieties with a high content of vitamins and microelements in fruits.

Another sign of a high content of vitamin C is the sepals directed forward (vegetative "crown" on the "crown" of the fruit). If the sepals are bent back, and the petals of the "crown" seem to lie on the sides of the fruit, then there will be less vitamin C in the rosehip.

In any case, the fruits must be ripe. In our country, wild rose is harvested starting around October, trying to be in time before the first frost. Choose fruits of dark red saturated color. An orange spot on the skin indicates that the wild rose has not yet ripened.

Store freshly picked wild rose no more than 5-7 days. During this time, you need to have time to either use it or dry it. In dried form, under the right conditions, the blanks can be stored until the next harvest. "Correct" are the conditions under which the fruits are placed in a breathable canvas bag. You can also store the fruits in a glass jar, but then it should be covered with gauze or burlap and put in a dark place.

Rosehips should also be dried in a dark, cool and dry room in a natural way to a state of brittleness (the fruit should break if you press on it). So that the fruits do not become moldy, it is advisable to mix them periodically. It is impossible to wash the berries before drying.

A controversial assessment is caused by the method of drying fruits in the oven. In this version, the wild rose is laid out on a baking sheet in one or two layers, the oven door is slightly opened so that moisture comes out and the temperature is set at about 80-90 C for a quarter of an hour. After that, the temperature is lowered to 50-60 C and the product is dried for another 5- 7 o'clock. The berries obtained in this way, even in the dried state, can remain large and smooth, but since the wild rose in the oven is exposed to high temperatures for a long time, the probability of preserving the valuable vitamin in it is sharply reduced.

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Rosehip - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of wild rose and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the product are indicated, the use of wild rose in various types of medicine and the effectiveness of its use in various diseases are considered. Potentially adverse effects of wild rose on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.



Vitamin F - description, effect on the body, best sources

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Abstract . The term vitamin F refers to essential fatty acids, namely linoleic and alpha-linoleic. They are ingested in the diet as saturated and unsaturated (mono- and poly-) fatty acids and play an important role in lowering cholesterol levels, regulating blood pressure, and reducing the risk of strokes and heart attacks. In addition, vitamin F is essential for brain development in the fetus, newborn, and child, and for maintaining brain function in adults.

Keywords: vitamin F , essential fatty acids, benefits, harms, beneficial properties, contraindications

Discovery history

In the late 1920s, scientists became interested in the nutritional value of fats. Prior to this , it was known that dietary fats provided energy production and contained vitamins A and D. Several scientific articles have been published that describe a previously unknown deficiency that occurs when all types of fat are excluded from the diet, and the existence of a new vitamin - F is suggested . After further experimentation, scientists found that the deficiency could be cured by taking pure "linoleic acid", and in 1930 the term "essential fatty acids" was first used [3].

Foods Rich in Vitamin F

Saturated and monounsaturated fatty acids are widely distributed in animal products such as meat and dairy products. Monounsaturated fatty acids are also present in some vegetable oils - olive, avocado, almond, canola, peanut and palm. They are considered the healthiest in the human diet because they do not raise cholesterol levels to the same extent as saturated fats, and they are less prone to spontaneous oxidation than polyunsaturated fatty acids. In addition, they do not turn into potent biologically active compounds that can disrupt the balance of various body systems, which often happens with polyunsaturated fatty acids [1].

The family of polyunsaturated fatty acids also includes two different groups - "omega-3 fatty acids" and "omega-6 fatty acids". Both substances are considered essential fatty acids because they cannot be

synthesized by humans. The initial fatty acid of the omega-3 group is alpha-linoleic acid, while for the omega-6 group it is linoleic acid [4].

Fat content of nuts and seeds [2]

Nuts and seeds	Linoleic acid	Alpha Linoleic Acid	Saturated fatty acids
Walnut	38.1	9.08	6.1
pine nut	33.2	0.16	4.9
Sunflower seeds	32.78	0.07	5.22
Sesame	23.58	0.42	7.67
Pumpkin seeds	20.7	0.18	8.67
Pecan	20.6	one	6.2
Brazilian nut	20.5	0.05	15.1
Peanut	15.6	0	6.8
pistachios	13.2	0.25	5.4
Almond	12.2	0	3.9
Hazelnut	7.8	0.09	4.5
Cashew nuts	7.7	0.15	9.2
Flaxseeds	4.32	18.12	3.2
Macadamia	1.3	0.21	12.1

Quantity in food

Product	Monounsaturated fatty acids (g/100 g)	Unsaturated fatty acids (g/100 g)	Polyunsaturated fatty acids (g/100 g)
Beef, raw meat	31.52	52.3	3.17
Chicken, raw meat	30.3	20.25	14.2
roasted peanuts	26.18	7.72	9.77
Butter, unsalted	23.43	50.49	3.01
Pickled herring	11.95	2.38	1.68
Yolk, chicken	11.74	9.55	4.2
Pickled olives	11.31	2.03	1.31
Gruyère cheese	10.04	18.91	1.73

Avocado	9.8	2.13	1.82
Sun-dried tomatoes	8.66	1.89	2.06
Roquefort cheese	8.47	19.26	1.32
eel fish	7.19	2.36	0.95
Hummus	5.34	2.56	8.81
Caviar, red or black	4.63	4.06	7.41
quail egg	4.32	3.56	1.32
Chicken egg	3.66	3.1	1.91
Tofu	1.93	1.26	4.92
Yogurt	0.89	2.1	0.09
Lentils, red or pink	0.5	0.38	1.14
Prunes	0.48	0.06	0.16
Corn, raw	0.43	0.33	0.49
Parsley	0.29	0.13	0.12
Oyster	0.25	0.47	0.53
Apricot	0.17	0.03	0.08
Ginger root	0.15	0.2	0
Mango	0.14	0.09	0.07
plums	0.13	0.02	0.04
curly cabbage	0.1	0.18	0.67
green onion	0.1	0.15	0.26
Nectarine	0.09	0.07	0.26

Daily requirement for essential fatty acids

European health authorities have developed recommendations for the intake of essential fatty acids for adults:

Omega 3	Alpha Linoleic Acid	2 grams per day
	Eicosapentaenoic acid (long chain omega-3 fatty acid)	250 mg per day
Omega 6	Linoleic acid	10 g per day.

In the United States, the fatty acid intake has been set at:

	Omega 3	Omega 6
Men (19-50 years old)	1.6 g/day	17 g/day
Women (19-50 years old)	1.1 g/day	12 g/day

The American Heart Association recommends eating fish (especially oily fish such as mackerel, trout, herring, sardines, tuna, and salmon) at least twice a week.

Pregnant women, breastfeeding mothers, young children and women who may become pregnant are advised not to eat certain types of fish - swordfish, shark and king mackerel - as there is a risk of high levels of hazardous substances in their meat (for example, mercury). In such cases, it is advised to use nutritional supplements.

It is important to maintain a proper balance of omega-3s and omega-6s in the diet as the two interact directly. For example, omega-3 acids (alpha-linoleic acid) help relieve inflammation in the body, and a large amount of omega-6 (linoleic acid) can, on the contrary, provoke inflammation. An imbalance of these two acids can lead to diseases, and the right combination of them maintains or even improves health. A healthy diet should contain about 2-4 times more omega-6 fatty acids than omega-3s. But experience shows that in developed countries, a typical diet includes 14-15 times more omega-6 acids, and many researchers believe that this imbalance is a significant factor in the increase in inflammatory diseases. In contrast, the "Mediterranean Diet" contains a healthier balance of these two substances and is considered more conducive to heart health [4].

At risk for developing a deficiency or imbalance of essential fatty acids are:

- newborns;
- pregnant and lactating women;
- patients with malabsorption in the gastrointestinal tract.

Beneficial features

Health Benefits

Eating enough polyunsaturated fatty acids in the form of omega-3 and omega-6 is very important as they play a critical role in:

- development and maintenance of the normal functioning of the brain;
- maintenance of vision;
- immune and inflammatory responses;
- production of hormone-like molecules.

In addition, omega-3s contribute to the maintenance of normal blood pressure, triglyceride levels, and heart health.

Essential fatty acids for disease

- **for premature babies:** omega-3 is a necessary substance in the formation of the brain, nerve cells, including the retina. It is also important for visual and neurological processes.
- **during pregnancy and breastfeeding:** the fetus in the womb and the newborn baby receives omega-3 exclusively from the mother's body, so the intake of essential fatty acids must meet the requirements of the mother and child.

- **against heart disease:** studies show that eating a large amount of omega-3s helps reduce the risk of heart disease and high blood pressure. Studies in heart attack survivors have shown that taking omega-3 supplements every day can reduce the risk of stroke and recurrent heart attacks.
- **against cancer:** a healthy balance between omega-3 and omega-6 acids plays an important role in preventing the development and growth of tumors, especially breast, prostate and rectal cancer. Fatty acids in these cases can be used both independently and in combination with other vitamins - C, E, beta-carotene and coenzyme Q 10.
- **against age-related diseases:** studies show that people who have a healthy balance between omega-3 and omega-6 in their diet and eat fish regularly have a reduced risk of developing age-related eye diseases.
- **against Alzheimer's disease:** insufficient intake of omega-3 acids may be a risk factor for the development of Alzheimer's disease and other types of dementia [5].

Interactions with other elements and beneficial food combinations

Nutritionists advise eating foods rich in cofactors that promote the absorption of essential fatty acids. They help further processing of acids after they enter the body. The key cofactors are:

- **magnesium** : sources are lightly cooked spinach, kelp, pumpkin seeds and pulp, steamed broccoli .
- **zinc** : lean beef, pork, lamb, crab, poultry, beef liver.
- **B vitamins** : seeds, seaweed, grains.
- **Biotin** : Eggs are a good source.
- **vitamin C** : greens, broccoli, sweet peppers, fresh fruits, especially strawberries and citrus fruits.

Polyunsaturated fatty acids are susceptible to oxidation. Therefore, they are advised to consume them with a large amount of antioxidants in order to maintain fragile bonds in their chemical structure. An excellent source of antioxidants, for example, are colorful fruits and vegetables. Antioxidants that prevent fatty acid oxidation include alpha-lipoic acid (found in beef, dark green leafy vegetables), vitamin E (from whole grains of wheat, seeds, and avocados), and coenzyme Q 10 (generally produced in the liver, but in some cases, it must be taken medically). It is recommended to avoid the consumption of oxidized fatty acids - this occurs when the oil from the seeds is used for frying, exposed to light or heat. Oxidized poly- and mono-unsaturated acids are also found in ready-to-eat foods, even organic ones, such as pies, convenience foods, falafel, etc.

digestibility

In order to improve the metabolism of essential fatty acids in the body, one should:

- Maintain a healthy balance of saturated, monounsaturated and polyunsaturated fatty acids and reduce processed fats.
- optimize the ratio of consumption of omega-6 and omega-3. Many studies recommend a 4:1 ratio;
- eat enough nutrients that interact with fatty acids;
- reduce the number of factors that can interfere with the absorption of fatty acids.

How to adjust and improve nutrition?

A maximum of 30-35 percent of the daily diet should be fat.

Most of these fats should be monounsaturated fatty acids. They are found in olive oil, rapeseed oil, avocado oil, cashew, pistachio, sesame oil, as well as in the meat of “poultry” poultry. When choosing olive oil, choose an organic, cold-pressed, unfiltered oil, and store it in a cool, dark place (not the refrigerator). This oil is used for dressing salads and cooking at low temperatures. Organic cold-pressed rapeseed oil is also gaining popularity due to its health benefits. But it's best not to heat it to avoid destroying the omega-3 fatty acids.

Saturated fat can be included in the diet, but it is advisable not to exceed the recommended maximum dose of 10 percent of total calories consumed per day, or 20 grams for women and 30 grams per day for men. Saturated fats are the most suitable for cooking as they are the most stable. If you want to sauté vegetables, for example, then coconut oil, butter, lard in small amounts is a healthier choice than vegetable oil, olive oil, or a variety of seed oils. It is believed that the most useful oil for frying is coconut oil. More budget-friendly options are butter, lard, ghee, goose fat, or olive oil, depending on cooking temperature and health.

Eat foods containing natural omega-6 acids (linoleic acid). The best sources of omega-6s are raw seeds, especially sunflower seeds, pumpkin seeds, chia seeds, sesame seeds, and hemp seeds. The oils from these seeds are also very useful. It is best to store them in the refrigerator and do not heat treat. One tablespoon of raw seeds or oil from them can be consumed per day [2].

It is recommended to reduce the consumption of sugar, fructose and alcohol.

Rules for cooking essential fatty acids

Fatty acids are destroyed under the influence of three main factors - **light, air and heat**. This should be considered when preparing and storing foods rich in omega-3s and omega-6s. Frying and deep-frying expose fats to three destructive factors at once. Fats that have been exposed to heat can cause atherosclerosis, prevent air from entering the cells of the body, lower immune system function, and potentially increase the risk of cancer [7].

Application in official medicine

In official medicine, essential fatty acids are used for prevention and in the complex treatment of various diseases. Other than that, the full impact of these substances is still under investigation.

There is some evidence that omega-3 fatty acids can treat and prevent **atherosclerosis** by interfering with the formation of blood clots. They lower blood pressure and pulse rate, reduce inflammation, and improve vascular and platelet function [1].

Diabetic **patients** often have elevated levels of fat in their blood. Studies show that omega-3 fatty acids (namely, long chain acids - eicosapentanoic and docosahexaenoic acids) obtained from fish oil can reduce the amount of this oil. It should be noted that excessive consumption of fatty acids can potentially increase blood sugar levels.

Several studies have shown that consuming omega-3 vitamins has a positive effect on the health of those who suffer **from inflammatory diseases** such as **rheumatoid arthritis**. Among the effects, there was a decrease in joint pain, limited movement in the morning, and a decrease in the number of medications taken. At the moment, the impact of omega-3s on the course of diseases such as asthma and Crohn's disease is being considered.

Essential fatty acids are very important for mental health. Omega-3 is an important component of the nerve cell membrane, thanks to which they transmit information. It has been noted that in **depressed patients**, omega-3 levels were extremely low, and the ratio of omega-3 to omega-6 was very high. The use of oily fish 2-3 times a week for 5 years significantly improved the condition of patients. Improvement after taking omega-3 in combination with drugs was also noted in patients with **bipolar disorder**.

When assessing the level of fatty acids in patients with **schizophrenia**, it was noted that in each of the interviewed patients (20 people), who also took antipsychotics, the ratio of omega-3 to omega-6 was reduced. It remained so even after the death of the patient. Taking 10 grams of fish oil per day, in turn, had a positive effect on the symptoms of patients [6].

Low levels of certain fatty acids may be seen in children with **hyperactivity disorder and attention deficit disorder**. A balanced intake of omega-3 and omega-6, in general, has brought a positive result for both children with ADHD and adults.

Fatty acids are one of the most important components in the treatment of patients with **anorexia** [5].

Essential fatty acids during pregnancy

Essential fatty acids are vital building blocks of cell membranes and therefore promote the formation of new tissues. Primary fatty acids cannot be synthesized by humans, so human health depends on the intake of fatty acids from food.

The fetus in the womb is completely dependent on the level of fatty acids in her body. They affect the development of the nervous system and retina of the child. Studies show that during pregnancy, the level of fatty acids in the mother's body rapidly decreases. This is especially true for docosahexaenoic acid - it is the main structural and functional acid in the central nervous system. By the way, this acid is mobilized in the mother's body for entry into the body of the fetus, and at the birth of the first child, the level of this acid in the mother is higher than at the birth of subsequent children. This means that after the first pregnancy, the amount of docosahexaenoic acid in the mother is not restored to its previous level. It was noted that docosahexaenoic acid has a positive effect on the volume of the skull, weight and height of premature babies [8].

Omega-3 and omega-6 fatty acids are also very important for fetal development. In order to get enough of them, it is advised to include in the diet of a pregnant woman such foods as vegetable oils, fish 2 times a week, as well as vitamins, which include essential fatty acids [9].

The use of vitamin F in cosmetology

Due to their beneficial effect, especially on the skin, essential fatty acids (aka vitamin F) are of great importance in cosmetology, becoming more and more widely used components of many cosmetic products intended for daily face and body care. Deficiency of these substances can lead to excessive dryness of the skin. If vegetable oils, from which essential fatty acids are obtained, act as a cosmetic base, such products prevent moisture loss from the skin by creating a protective layer on the epidermis. In addition, they soften the stratum corneum and reduce inflammation of the skin, thereby relieving pain. In addition to this, they play a very important role in the proper functioning of the human body. Medicine recognizes the beneficial effect of vegetable oils on the biological synthesis of cell membrane components, they are involved in the transport and oxidation of cholesterol. The lack of essential fatty acids can lead to vascular fragility, deterioration of the immune system, blood clotting process and lead to atherosclerosis.

Linoleic acid (found in sunflower, soybean, saffron, corn, sesame, peanut, wheat germ and grape seed oils) improves the lipid barrier of dry skin, protects against moisture loss and normalizes skin metabolism. It has been noted that people with acne often have low levels of linoic acid, leading to clogged pores, blackheads and eczema. The use of linoic acid for oily and problematic skin leads to the normalization of the sebaceous glands, cleansing the pores and reducing the number of rashes. In addition, this acid is part of cell membranes.

Another essential fatty acid for the skin is gamma-linoleic acid (found in borage, blackcurrant, bindweed and hemp oil) and alpha-linoleic acid (found in linseed, soybean, rapeseed, walnut, wheat germ and phytoplankton oils). They are physiological components of cell membranes and mitochondria in the human body. And eicosapentaenoic and docosahexaenoic acids (both omega-3s found in fish oil) prevent the development of tumors, relieve inflammation after sunburn, reduce irritation and stimulate recovery processes.

Essential fatty acids make skin more hydrated and smoother in appearance. Unsaturated fatty acids are able to penetrate into cell membranes, restore the damaged epidermal barrier and limit moisture loss. They are used as a base for creams, emulsions, cosmetic milks and creams, ointments, hair conditioners, cosmetic masks, protective lip balms, bath foams, nail care products. Many natural substances with high biological activity, such as vitamins A, D, E, provitamin A and phospholipids, hormones, steroids and natural dyes dissolve in fatty acids [10].

All of the above benefits can be achieved by taking vitamins, applying drugs to the skin, or intravenously [11]. **Each specific case requires consultation with a medical specialist.**

Vitamin F in folk medicine

In folk medicine, essential fatty acids are considered very important for the respiration of the organs. They help maintain the elasticity of cell membranes and contribute to normal lung activity. Symptoms of deficiency and imbalance of vitamin F are brittle hair and nails, dandruff, loose stools. Fatty acids are used in the form of vegetable and animal oils, seeds and nuts. The supply of vitamin F is replenished primarily from food. For example, it is advised to eat 50-60 grams of sunflower seeds in order to provide the daily requirement of fatty acids [12]. In addition, vitamin F is considered a useful remedy for inflammation and burns. For this, oils are primarily used.

Vitamin F in scientific research

For the first time, an association has been found between eating large amounts of nuts during the first trimester of pregnancy and the effects on a child's cognition, attention, and long-term memory. Spanish researchers took into account the consumption of nuts such as walnuts, almonds, peanuts, pine nuts and hazelnuts. Positive dynamics is attributed to the presence of folic acid in nuts, as well as omega-3 and omega-6. These substances tend to accumulate in neuronal tissues, in particular in the frontal part of the brain, which is responsible for memory and executive functions of the brain [13].

According to the American Journal of Respiratory and Critical Care Medicine, eating omega-3 and omega-6 fatty acids may have the opposite effect on asthma severity in children, as well as their response to indoor air pollution. Children with higher levels of omega-3s in their diets experienced fewer asthma symptoms in response to polluted air. Conversely, increased consumption of foods high in omega-6 worsened the clinical picture of sick children [14].

According to a study conducted by scientists at the University of Nebraska Medical Center (USA), omega-3 fatty acids may be able to inhibit the growth of breast cancer cells. This effect is thought to be

due to the anti-inflammatory properties of omega-3s. Thus, a diet rich in seafood may prevent the development of tumors [15].

Weight regulation

You should pay attention to the amount of carbohydrates consumed. The most important step is to eliminate sugar and, if possible, starch from the diet. Non-alcoholic sweetened drinks should also be avoided.

Fats should make up 5 to 6 percent of your energy intake.

For dressing salads and for frying, it is best to use different oils. For example, olive, sunflower oil is best suited for salads.

You should eat as little fried foods as possible, due to the chemical reactions that occur in the oil during frying [1].

Contraindications and warnings

Signs of a Vitamin D Deficiency

Some possible signs of a deficiency and/or imbalance between essential fatty acids are itching, dryness of the scalp and body, brittle nails, as well as atypical symptoms - asthma, eczema, excessive thirst and urination, aggression or violence, bad mood, anxiety, a tendency to inflammatory processes and hormonal imbalances (including cortisol, thyroid hormones and insulin). The balance of fatty acids in the body is important for every physiological process. To determine the level of fatty acids, among other things, an analysis of the red blood cell membrane or functional testing of B vitamins and minerals is carried out.

Fat imbalance carries the following risks:

- excessive consumption of trans fats can contribute to cardio-metabolic problems, which are precursors to diabetes and cardiovascular disease;
- excessively high intake of omega-6 compared to omega-3 may be associated with chronic inflammation and a number of degenerative diseases ;
- An excess of omega-3s and a lack of omega-6s can also lead to a number of health problems.

An excess of omega-3 is dangerous:

- for people suffering from blood clotting diseases or using anticoagulants;
- may cause risk of diarrhea, bloating;
- an increase in blood sugar levels.

An excess of omega-6 is dangerous:

- for people suffering from seizures;
- for pregnant;
- due to deterioration of inflammatory processes.

Interaction with other substances

It is believed that the need for vitamin E increases with an increase in the intake of essential fatty acids.

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Vitamin F - description, benefits and sources

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Abstract: The term vitamin F refers to essential fatty acids, namely linoleic and alpha-linoleic. They are ingested in the diet as saturated and unsaturated (mono- and poly-) fatty acids and play an important role in lowering cholesterol levels, regulating blood pressure, and reducing the risk of strokes and heart attacks. In addition, vitamin F is essential for brain development in the womb, newborn, and child, and for maintaining brain function in adults.



DASH Diet - The Science behind it, Proven Health Benefits, Advantages and Disadvantages

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Abstract . The DASH diet (Dietary Approaches to Stop Hypertension) is a nutritional system designed to maintain normal blood pressure levels. The diet uses foods that contain a minimum amount of sodium, rich in calcium, magnesium and potassium. The menu is dominated by unlimited vegetables and fruits, low-fat dairy and whole grains, nuts, fish and poultry. Red meat, sweets and sugary drinks are allowed with restrictions.

Keywords: DASH diet, DASH , harm, beneficial properties, contraindications

History of occurrence

The DASH diet has repeatedly been included in studies conducted by the US National Institutes of Health. One of them showed that blood pressure can be reduced by dieting, even with a daily intake of 3300 mg of sodium. In addition, following a low-salt diet reduces the risk of many diseases, such as stroke, heart and kidney failure, kidney stones, diabetes, and some types of cancer. Also, the DASH diet has proven to be an effective way to lose weight and improve health. At the same time, the diet is rich in tasty, varied and full-fledged dishes without sharp restrictions. Because of these benefits, the DASH diet was ranked #1 in the US News & World Report's 2011-2018 diet rankings.

The original studies were not intended to control weight loss, the diet was rich in refined and starchy foods and based on nutritional ideas typical of the mid-90s. 20th century.

However, the issue of healthy weight loss has become increasingly relevant for many people. This led to the need for a simple weight loss plan based on DASH products. It took a few more studies to add protein foods, healthy “correct” fats to the cardiovascular system, and reduce the amount of “empty carbohydrates” in the DASH diet. So the diet against arterial hypertension began to promote sustainable and safe weight loss.

The main source of DASH diet plans are books by nutritionist Marla Heller, former president of the Illinois Dietetic Association. The recommendations are based on the principles of healthy weight maintenance. The diet is filled with fruits and vegetables, they are hearty and voluminous. Foods rich in protein and healthy fats can easily satisfy hunger. Since spikes in blood sugar cause hunger, the DASH diet keeps blood sugar stable without a roller coaster. It also reduces the risk of developing diabetes or makes it easier to control an existing disease. A healthy diet lowers triglycerides, raises the "good" HDL cholesterol, and lowers the "bad" LDL cholesterol. A sufficient amount of protein in the diet allows you to avoid a slowdown in metabolism and maintain muscle mass while losing adipose tissue.

The DASH-style dietary recommendations were intended primarily for people suffering from hypertension. However, this plan can be used as a healthy eating model for the whole family. Of course, the diet was designed to lower blood pressure. But in addition, it lowers cholesterol and reduces inflammatory reactions, improves the cardiovascular system. Effective for all age categories - successfully used to lower blood pressure in both adults and children. Therefore, everyone can use DASH nutrition in their diet. ^[one]

Scientific basis of diet

The DASH diet is based on scientific research on dietary approaches in the fight against hypertension. It has been shown to keep blood pressure within acceptable limits, lower cholesterol and improve insulin sensitivity. However, blood pressure control is based not only on a traditional diet low in salt or sodium. The diet is based on a nutritional plan that has been shown to lower blood pressure by providing an abundance of potassium, magnesium, calcium, and fiber. The diet is rich in fruits, vegetables and low-fat dairy products, whole grains and contains less refined foods than the original DASH diet.

Therefore, the DASH diet is recommended by the National Heart, Lung, and Blood Institute of the US Department of Health and Human Services, ^[2] the American Heart Association. This diet is referenced in the Dietary Guidelines for Americans ^[3] and the United States Guidelines for the Treatment of High Blood Pressure. ^[four]

Tips for Switching to a DASH Diet

- Add a serving of vegetables for lunch and dinner.
- Replace one meal with a serving of fruit, or add them as a snack. You can also eat canned and dried fruits, but choose without added sugar.
- Cut in half your usual serving of butter, margarine or salad dressing, use dressings without fat or with a low fat content.
- Replace full-fat dairy products with low-fat ones.
- Reduce the daily portion of meat products to 170 gr., If possible, prepare vegetarian dishes.
- Enrich your diet with dried legumes.
- Replace snacks with chips or sweets with nuts, raisins, unsalted popcorn without oil, raw vegetables, low-fat drinking or frozen yogurt, unsalted crackers.
- When buying, pay attention to labels when choosing low-sodium foods.
- You can also limit yourself in salt gradually. Reduce to 2300-2400 mg of sodium per day (about 1 teaspoon) first. Once you get used to the new taste experience, cut down to 1500 mg of sodium per day (about 2/3 teaspoon). This is the amount of all sodium eaten in foods, not just added salt.

On the DASH diet, expect to get: Servings per day:

Cereals	7-8
Vegetables	4-5
Fruit	4-5
Low fat dairy products	2-3
Meat, poultry and fish	1-2
Nuts, seeds and dry legumes	4-5
Fats and oils	2-3
Sweets	up to 5 servings per week

One serving is:

- ½ cup cooked pasta or rice
- 1 slice of bread
- 1 cup raw fruits or vegetables
- ½ cup cooked fruits or vegetables
- 225 ml skimmed milk
- 1 teaspoon vegetable oil
- 85 gr. cooked meat
- 85 gr. soy tofu ^[5]

How does the DASH diet work?

The DASH diet helps lower blood pressure by increasing key nutrients in the diet. Potassium, calcium, magnesium help lower blood pressure. These substances enter the body due to the inclusion in the diet of a large number of fruits, vegetables, low-fat dairy products. Additionally, you should reduce the intake of sodium and salt, responsible for fluid retention in the body and increased pressure. Along the way, smoking cessation, moderate alcohol consumption, exercise, and weight loss are recommended, which is facilitated by the DASH diet itself. ^[6]

How to make it even healthier?

For weight loss and overall health, it is recommended to reduce the consumption of sugars added to foods, as well as refined and processed foods. This dietary modification will be especially beneficial for people with metabolic syndrome, prediabetes, or those with established diabetes. For women after menopause, such a diet will help to reduce excess weight, which is usually a difficult task in middle age. Such nutrition will reduce the body's need for insulin and reduce the tendency to store fat in the middle part of the body. Waist reduction is an important plus in reducing health risks. ^[7]

Vegetarian version of the DASH diet

The DASH diet exists quite organically as a vegetarian option. Refusing meat only increases its effectiveness.

Where to start?

- Choose foods that are whole, organic, unrefined, and locally grown if possible.
- Eat at least one serving of vegetables at every meal.
- Eat a serving of vegetables or fruits with every snack.
- Avoid wheat. it contains gluten. Swap refined grains like white bread, white pasta and white rice for whole grains like wild and brown rice and oats.
- Instead of seasonings containing salt, sugar, and flavor enhancers, use low-sodium natural seasonings such as herbs and spices. ^[eight]

Benefits of the DASH Diet

Adhering to this diet is quite pleasant and easy, since it does not restrict entire food groups, urging you to give up only fatty, sweet and salty foods.

The DASH diet can be followed indefinitely, becoming a literal eating style and lifestyle.

The DASH diet is suitable for all family members, regardless of age and the presence of pressure problems, keeping everyone healthy.

Following a DASH diet is quite convenient. The National Heart, Lung, and Blood Institute offers many tips for reducing sodium intake while eating out and preparing home-cooked meals. It is also allowed to replace part of the protein dishes and dishes with unsaturated fats with carbohydrates, about 10% of the daily diet. At the same time, according to research, the benefits for the heart will continue.

It's easy to find ready-made recipes for the DASH diet. The National Heart, Lung, and Blood Institute offers an online prescription database. ^[9] Lists of such prescriptions are published by other authoritative organizations, for example, the Mayo Clinic. ^[ten]

Eating in restaurants and cafes while following the DASH diet is quite possible. Restaurant meals are often fatty and salty. Therefore, avoid ordering pickled, canned or smoked foods in a restaurant. Ask the chef to cook with a limited selection of seasonings, using only natural spices and herbs. Opt for fruits or vegetables instead of soup. You can drink alcohol in moderation.

There is no feeling of hunger on the DASH diet. The emphasis is not on dietary restrictions on the size of portions, but on the consumption of lean proteins, fruits and vegetables rich in fiber. If your daily calorie intake is lower than usual, you will still not feel hungry, despite weight loss.

Disadvantages of the DASH Diet

Following the DASH diet takes some time to plan the diet, organize the purchases, check the information on the sodium content on product packages, choose the right foods, prepare meals outside the usual diet.

The habit of taste buds for salty foods can give a feeling of dissatisfaction with salt-restricted foods. Avoid tastelessness by seasoning your food with herbs and spices. As you get used to it, the taste will become stronger.

The need to replace the usual diet with a healthier one makes food more expensive.

The basic DASH diet does not aim to lose weight. Weight loss is possible, but not quickly, unlike specialized diets. To lose weight, you need to additionally monitor the daily caloric content of the diet.
[eleven]

Benefits of the DASH Diet

Although the DASH diet was created specifically to combat high blood pressure, it also benefits other body systems. Pay attention to it, even if your blood pressure is within the normal range - the systolic value is from 90 to 120 mm Hg. Art., and diastolic from 60 to 80 mm Hg. Art.

1. Lowers blood pressure

According to studies, DASH diet products significantly reduce systolic blood pressure, and reduced calorie intake further enhances this effect. ^[12] Even lowering blood pressure is low sodium intake along with the DASH diet. ^[13]

2. Reduces excess weight

Being overweight is a risk factor for hypertension. Losing even 3-5 kg improves the numbers on the tonometer. ^[14] The DASH diet is more effective at reducing excess weight and waist circumference than the traditional calorie-restricted diet. ^[fifteen]

3. Reduces the risk of diabetes

Some studies claim that the DASH diet improves insulin sensitivity, which improves the management of type 2 diabetes. She also struggles with the symptoms of metabolic syndrome - hypertension, high blood sugar, overweight.

4. Reduces the risk of certain types of cancer

Whole grains, vegetables, and nuts, as well as limiting salt, meat, and dairy products, reduce the risk of certain types of cancer ^[16], in particular colorectal cancer ^[17] and breast cancer ^[18].

5. Reduces the risk of cardiovascular disease

High blood pressure makes it harder for the heart to work. The World Health Organization (WHO) has recognized salt reduction as one of the top priorities in the fight against the global heart crisis ^[19]. Reducing the level of "bad" cholesterol and increasing the "good" cholesterol protects against plaque formation in the arteries. So the DASH diet reduces the risk of stroke and heart attacks.

Diet Tips

- **Fruit**

The DASH diet does not restrict fruit choices. It can be bananas, oranges, grapefruits, tangerines, pineapples, mangoes, grapes, apples, peaches, watermelons, apricots, various berries, etc. Dried fruits are welcome - dates, raisins, prunes, figs, etc. Unless you should choose dried fruits without soaking in sugar syrup or dipped in powdered sugar. Eat 4-5 servings of fruit per day. One serving is a medium fruit, a glass of fresh/frozen fruit, half a glass of cooked fruit or natural juice without sugar, a quarter of a glass of dried fruit.

- **Vegetables**

Any vegetables are also acceptable: broccoli and any kind of cabbage, tomatoes and sweet potatoes, sweet peppers, spinach, green beans and green peas. Like fruits, eat 4-5 servings of vegetables per day. A serving is one cup of raw chopped leafy or other vegetables, half a cup of cooked vegetables, or 100% vegetable juice.

- **Cereal crops**

The healthiest grains are brown and wild rice, oats, buckwheat, amaranth, quinoa and teff. They contain essential fiber and are free of gluten. Aim for 6 servings of grains daily, counting one serving as half a cup of cooked cereal.

- **Legumes, seeds and nuts**

Any nuts, seeds and legumes, like lentils, chickpeas, mung beans, various types of beans, peas, sea beans are a good option for a side dish or snack. The goal is to consume up to 4 servings per week. A serving in these foods is half a cup of cooked legumes, 1/3 cup of nuts, 2 tbsp. tablespoons of seeds or oil from nuts or seeds.

- **healthy fats**

Avocado, coconut, olive, peanut or almond oil without added sugar will benefit blood vessels and the heart. Serving - 1 teaspoon of oil, and you need 2-3 such servings daily.

- **Low fat dairy products**

The DASH diet recommends limiting the consumption of low-fat dairy products by choosing pasture-raised organic producers. If you're on a vegan version of the DASH diet, include plant-based milks like almond or coconut milk, non-dairy yogurts, and cheeses. The serving in this case is a glass of milk or vegan milk, or 1/3 cup cottage cheese/tofu, per day allows 2-3 servings from this category.

Foods to cut or eliminate

The DASH diet is quite varied and does not involve too many restrictions.

- **Meat**

The DASH Standard Diet recommends avoiding fatty meats due to saturated fat and high sodium content. Fatty beef, ham and pork should be excluded. Give preference to lean parts of chicken or fish. On a vegetarian DASH diet, meat will be eliminated altogether, making the diet even more effective.

- **Fatty dairy products**

Cheeses, full-fat milk and curdled milk are also excluded from the diet due to the excess of saturated fats in them.

- **Sugar and sweets**

The DASH diet does not completely exclude sweets with refined sugar, but limits them to 5 servings of low-fat sweets per week. A serving will be considered 1 tbsp. a spoonful of sugar, jam or jelly, 1 glass of lemonade or a drink containing sugar. Of course, it is better to completely abandon this serving of sugar and replace it with fresh fruit.

- **Sodium**

There are two limits for sodium intake in the DASH diet: 2300 mg and 1500 mg per day. Start at level one by limiting salt to 1 teaspoon per day. Once your taste buds have adapted, reduce the amount of sodium further to 2/3 teaspoon of salt. All sodium in foods should be accounted for, not just added salt.

- **Alcohol**

The DASH diet does not categorically exclude alcohol, but only advises moderation in use. This means no more than one serving per day for women and no more than two servings for men. One serving in this section looks like 400 ml. beer, 170 ml. wine or 50 ml. hard liquor. Remember that alcohol does not bring health benefits, while completely eliminating it significantly increases the healing effect of any diet. ^[twenty]

How to Control Sodium in Your DASH Diet

To achieve the results that the DASH diet promises, daily sodium intake should be no more than 2300 mg or, if necessary, 1500 mg.

The main way to achieve this is to choose healthier foods when you shop for groceries, cook in your kitchen, or visit food outlets.

Let's write out tips for reducing the amount of sodium in the diet in more detail for each situation.

Buying groceries in the store:

- Check food labels, especially processed foods and condiments, for alternative forms of low-salt, low-sodium foods.
- Choose fresh meats—poultry, fish, lean meats—instead of canned bacon, ham, and the like.
- Choose fresh, frozen fruits and vegetables over canned ones.
- Avoid foods with a clear excess salt - pickled cucumbers, pickled vegetables, olives, sauerkraut.
- Avoid fast foods - vermicelli, fragrant rice, mashed potatoes, etc.

Self-catering:

- Do not add salt when preparing cereals and side dishes of rice, pasta and cereals.

- Season cooked meals with fresh or dried herbs, spices, lemon or lime juice, seasonings without salt.
- Rinse brine-soaked and canned foods under running water to remove excess salt.
- Cut down on the amount of salt you add to all your meals.

Dining Out:

- Ask to prepare meals without added salt and monosodium glutamate.
- It is better to refuse to order Asian dishes; the flavor enhancers indicated in the previous paragraph are especially popular in them.
- Avoid foods containing bacon, pickles, olives, cheese, and other salty ingredients.
- Refuse dishes containing smoked, pickled, canned or cooked with the addition of soy sauce or broth ingredients.
- Instead of chips or french fries, opt for fruits or vegetables as a side dish.
- Undesirable processed foods are frozen dinners, prepackaged foods, and portioned soups. Condiments containing “hidden” sodium include ketchup, mustard, soy sauce, various salad dressings, and barbecue sauce.
- Note that most of the sodium that enters the body is not salt from the salt shaker. This is sodium from processed foods - salty snacks, cheese, sandwiches and hamburgers, meat dishes and pasta, soups and cold cuts, pizza, and even bread.
- To effectively reduce excess weight, in addition to limiting sodium / salt, you should gradually reduce the total number of daily calories consumed.

General tips for non-aggressive calorie reduction:

Eat small meals throughout the day, avoiding long breaks between meals and bouts of overeating after a break.

Reduce the amount of meat you eat by increasing the amount of vegetables, fruits, dried legumes, or whole grains.

Replace desserts and sweets with fruits and vegetables.

Replace drinking juice or carbonated sugary drinks with clean water.

In addition to reducing sodium intake, the effectiveness of the DASH diet is achieved by increasing the amount of potassium in the diet.

The most potassium-rich foods are potatoes (regular and sweet), yogurt (regardless of fat content), orange juice, bananas, apricots, prunes, various legumes (soybeans, lentils, beans, peas), almonds.^[21]

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DASH diet - history, scientific evidence, proven health benefits, advantages and disadvantages, dietary advice

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Abstract: The DASH diet was developed specifically to combat hypertension and alleviate diseases, one of the symptoms of which is high blood pressure. The key principle of the diet is to limit the amount of salt consumed, as well as the emphasis on foods rich in potassium, magnesium and calcium.

The diet is based on the consumption of healthy and wholesome meals based on fruits, vegetables, low-fat dairy products, whole grains and legumes, with limited or no lean meats and fish, and cardiovascular-healthy fats. The diet is rich in tasty, satisfying and healthy dishes, without drastic restrictions. If you need to reduce weight, you should additionally pay attention to the daily caloric content of the diet.

The DASH diet is suitable for almost any member of the family and makes everyone healthy.