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Corn (lat. Zea mays)

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Abstract. The article discusses the main properties of corn 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 corn in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of corn on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its application are considered.

Keywords: corn, benefits, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical comp	osition of corn (a	acco	rdi	ing to <u>Fo</u>	<u>ood+</u>).	
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Main substances (g/100 g):	Fresh yellow corn [1]	Boiled yellow corn [2]	Frozen yellow corn [3]	Canned yellow corn [4]
Water	76.05	73,41	71.79	82.61
Carbohydrates	18.70	20.98	23.50	13.86
Sugar	6.26	4.54	3.78	4.15
Squirrels	3.27	3.41	3.28	1.95
Alimentary fiber	2	2.4	2.8	1.7
Fats	1.35	1.5	0.78	0.77
Calories (kcal)	86	96	98	61
Minerals (mg/100 g):				
Potassium	270	218	294	136
Phosphorus	89	77	87	46
Magnesium	37	26	32	fifteen
Sodium	fifteen	one	5	195
Calcium	2	3	four	four

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Iron	0.52	0.45	0.68	0.36		
Zinc	0.46	0.62	0.70	0.39		
Vitamins (mg/100 g):	Vitamins (mg/100 g):					
Vitamin C	6.8	5.5	7.2	2.6		
Vitamin PP	1,770	1.683	1.681	0.884		
Vitamin B1	0.155	0.093	0.103	0.015		
Vitamin B6	0.093	0.139	0.179	0.037		
Vitamin E	0.07	0.09	0.09	0.03		
Vitamin A	0.056	0.079	0.073	0.010		
Vitamin B2	0.055	0.057	0.088	0.015		

The greatest losses of vitamins and some minerals occur during the preservation of the product. So, the presence of potassium, phosphorus and magnesium is almost 2 times reduced.

The sodium in corn is the mineral that varies the most with the type of preparation. If during cooking sodium almost disappears from the composition, then during canning its concentration increases by more than 10 times.

If fresh corn is not available, then the most complete replacement will be the frozen version, in which the proportion of vitamins and minerals not only does not decrease, but even increases in some positions.

Medicinal properties

The main healing function is performed by corn stigmas and oil, which have a beneficial effect on several organs and life support systems of the body at once:

- In the circulatory system, substances isolated from the stigmas increase the number of platelets, contribute to the normalization of the blood coagulation process, and vitamin E in the oil reduces the concentration of cholesterol after damage to the inner wall of the vessel.
- Antioxidant properties and the ability to protect liver cells allows the use of stigmas in the treatment of toxic hepatitis and complications of diabetes.
- The choleretic effect of corn oil and stigmas, as well as an increase in bile secretion with a decrease in its viscosity and density, helps to fight a number of diseases of the gallbladder and liver.
- Maize hairs in water infusions of various concentrations are used to dissolve carbonate stones.

Some of the medicinal properties of raw corn are enhanced after processing, and some, on the contrary, are lost. So, for example, popcorn (if it is not "discredited" by the addition of a large amount of sugar and salt) increases the amount of plant antioxidants (polyphenols) that prevent cell oxidation and aging. And corn flakes, having passed the stages of processing and preparation, lose almost all phenolic acids that can fight cancerous tumors ^[5].

Use in medicine

For medicinal purposes, a raw material known as "corn hair" is used, obtained from corn columns with stigmas. Stigmas contain fat-soluble, hydrophobic vitamins (participating in the synthesis of proteins and ensuring a normal level of blood clotting), ascorbic acid (ensuring the functioning of connective and bone tissue), fatty oil, some steroidal alcohols, glycosides, traces of essential oil.

Since they have a choleretic and diuretic effect, their liquid extract is prescribed for insufficient bile secretion, as well as for infectious inflammation of the bile ducts (cholangitis), inflammation of the gallbladder (cholecystitis), the formation of carbonate stones there, liver diseases (hepatitis). A little less often - with inflammation of the prostate gland, urinary tract, and also as a means to slow bleeding.

Unrefined fatty oil, which contains up to 57% in the germs of some varieties of maize, is prescribed as an auxiliary and prophylactic agent for obesity, lipid and protein metabolism disorders in atherosclerotic formations, as well as for impaired glucose uptake and the risk of developing diabetes mellitus.

In folk medicine

Despite some differences in the approach to treatment, traditional healers often used corn remedies for the same indications as modern doctors representing scientific medicine.

- The South Slavic tradition prescribed the use of a decoction of corn stigmas for urolithiasis and inflammation of the urinary tract. But in addition, they were prescribed to combat tapeworms.
- Eastern Slavic healers "prescribed" corn decoctions for diseases of the gallbladder and ducts, and also as a diuretic.
- In Central Asia, corn was used to treat tuberculosis. Boiled corn cakes with vinegar were applied to eczema, they healed skin cracks on the arms and legs. Chewed corn grain was considered a remedy that could improve eyesight if the resulting slurry was applied to the eyes. As a medicinal drug, such a gruel was also used for insect bites. Eaten corn belonged to fasteners in gastrointestinal disorders. And an enema of boiled flour, according to traditional healers, could cure intestinal ulcers.

Not everywhere, but quite widely in folk medicine, the ability of corn stigmas to relieve nervous tension and act soothingly is still used. In addition, in lotions and by internal use, stigmas are recommended for glaucoma and hemorrhages in the vitreous body and conjunctiva of the eye.

Decoctions and infusions

There are several recipes for decoctions and infusions of corn stigmas, which are prepared depending on what health problems need to be addressed.

- With diseases of the biliary tract. Raw materials in the amount of 2 tbsp. spoons are crushed and poured with 250 ml of boiling water. After 30 minutes of infusion, the liquid is filtered and then taken warm, 60-70 ml before meals three times a day.
- **To restore blood clotting.** A similar method of preparation is used, but 100 g of raw materials are taken, and the decoction is taken in 1 tbsp. spoon every hour.
- As a diuretic for edema and kidney disease. Raw materials in the amount of 1 teaspoon are crushed, poured into an enameled pan, 200 ml of boiling water is poured, closed with a lid and aged for half an hour until cool. After filtering, the liquid is taken in 2-3 tbsp. spoons before meals three times a day.
- For the dissolution of stones in the kidneys and ureters. Raw materials in the amount of 1 teaspoon are crushed, 200-250 ml of water is poured and boiled for an hour over very low heat. In case of boiling off, you can add a little water until the volume is restored. The broth is infused until cool and taken 1-2 tbsp. spoons before meals four times a day.
- With eye hemorrhages. Raw materials in a volume of 15 g are poured with 200 ml of boiling water and infused for 40 minutes. After filtering, the liquid is taken in 2 tbsp. spoons three times a day.

- With uterine bleeding. The infusion is prepared in a similar way, but 1 teaspoon of raw materials is used and the infusion time is reduced to 20 minutes. It is taken in 2-3 tbsp. spoons before meals (20 minutes) three times a day.
- In infusions for weight loss, raw materials (3-4 tablespoons) are usually infused for about 3 hours in a thermos, and the liquid itself is taken in 1 tbsp. spoon before meals (30 minutes) three times a day.

in oriental medicine

In traditional Chinese medicine, foods are classified according to the extent to which they represent the two fundamental principles of Yin and Yang (on a scale of -3 to +3, respectively). Corn in this division, along with other cereals, is the basis of human nutrition, with a value of "-1" (the minimum degree of Yin), considered a very balanced product.

It has a tonic effect on the vital energy of the pancreas and spleen, soothes and "extinguishes" the heat of the liver, regulates the fullness of the urinary and gall bladders, and also moves the blood of the "triple warmer / heater", through which the Qi energy performs its functions.

Tibetan medicine expands the list of diseases and pathological conditions in which corn is useful, adding to it constipation, poisoning, leucorrhoea, urinary retention. It is believed that corn can slightly aggravate Cold diseases with Kapha (Plucus) at the base. There are many more of them than Heat diseases and, if started, they are more difficult to treat.

In scientific research

Recent scientific studies have made it possible to talk about corn-based preparations as a way to effectively combat obesity, type 2 diabetes, and various types of inflammatory processes.

In the spring of 2019, a team of researchers from the University of Illinois tested how purple (purple) corn phenols in water extracts extracted from the pericarp of Apache hybrids Red will affect laboratory mice. The concentration of the obtained anthocyanins and phenolic compounds differed significantly depending on the specific hybrid, but the therapeutic effect was recorded to some extent in all cases.

Scientists noted a change in the development of adipose tissue cells (adipocytes) under the influence of maize extract and a decrease in fat content by 8-56% (depending on the phenol studied). In addition, they found that a key marker of insulin resistance decreased by 29-64% and cellular glucose uptake decreased by 30-139% (depending on the anthocyanin chemistry).

It is assumed that in the near future the choice of the ideal concentration of phenolic compounds and chemical composition will reduce the effect of oxidative processes in insulin-resistant fat cells and, in general, improve the insulin profile in people suffering from obesity ^[6].

A few years earlier, in 2012, a Korean research team from the Department of Biochemistry at Hallym University also experimented with purple maize from Chile and Peru to determine how anthocyanins derived from this maize would affect the development of diabetic kidney disease (nephropathy). The experiment was carried out in 2 stages: first "in a test tube" (in vitro) and then in mice.

Within 6 hours, the cells were exposed to corn anthocyanins at different concentrations from 1 to 20 μ g/ml. Mice (both diabetic and control) were injected with the drugs for 8 weeks. As a result, an interruption of the cellular signal was recorded, which stimulates the mechanism for the development of nephropathy, and can also inhibit macrophage infiltration, which is closely associated with kidney

inflammation. Thus, the researchers concluded that the use of maize anthocyanins can be considered as an element of an overall strategy for the prevention of renal vascular disease in type 2 diabetes ^[7].

A whole range of studies has been devoted to the effect on the body of high fructose corn syrup (with a glucose and fructose ratio of 45:55, respectively), which is added on an industrial scale to sweet water, bread, ketchup, mayonnaise, yogurt and is used in cooking.

- Research conducted at the Baylor College of Medicine in March 2019 showed that daily consumption of corn syrup in drinks, even in small quantities (for a person, this is about 0.35 liters per day), leads to a progressive growth of intestinal tumors, regardless of the degree of obesity. It is assumed that the syrup "feeds" the cancerous tumor, so that it grows faster. The study was conducted on mice in which a mouse model of colon cancer was created by deleting a certain gene. The control group of rodents drank pure water throughout the experiment, and they did not observe such intensive cancer growth ^[8].
- In 2008-10 Scientists from the Duke University Medical Center, after examining the dietary questionnaires of 427 adult patients with non-alcoholic fatty liver disease, suggested that it was the increased consumption of corn syrup that led to scarring and the development of fibrosis ^[9].
- According to a research group at Princeton University, corn syrup is more likely to cause obesity than other sweeteners of the same calorie content. In one experiment, experimental male rats received water with syrup, while control groups received water sweetened with table sugar and sucrose. Males drinking syrup-containing water gained weight much faster. Moreover, they did not just get fat, but showed signs of morbid obesity. The second experiment, which was carried out for six months, led to similar conclusions ^[10].

It must be said that the Corn Processors Association responds to almost all critical studies of scientists, pointing to certain errors (or incorrect interpretation) in the experiments. But scientists continue to work. And more often it is not aimed at debunking corn products, but at finding their beneficial properties.

For example, researchers from Purdue University recently concluded that the addition of soluble corn fiber can help accumulate and retain calcium in the bones if fiber is consumed at critical moments in the process of calcium formation in a woman's life - during adolescence and postmenopause^[11].

Weight regulation

The use of corn in diets for weight loss causes conflicting reactions from experts. More often, it is recommended to exclude it from the diet or reduce consumption to a minimum during the course. However, there are people who practice mono-nutrition in express diets, talking about the feeling of satiety and quickly leaving kilograms. The 4-day program of the Canadian nutritionist Ishmael Kitner is also based on the use of this particular cereal.

- The first two days are eaten: grains of 2 cobs of boiled corn (if it is not possible to use fresh or frozen grains, then canned ones will do); vegetables and fruits 1 each carrots, cucumbers, tomatoes, sweet peppers, onions, kiwi.
- The last two days, the same thing is used, only with the addition of boiled champignons in the amount of 150 g.
- During all this time, it is advisable to drink at least a liter of water per day, and also add a drink from brewed cob fibers to the diet.

Regardless of dietary preferences, when choosing corn, you need to consider its variety and method of preparation. The least calories in the raw version - about 85 Kcal / 100 g, boiled and canned corn in

sweetened syrup contain approximately the same amount - 120-125 Kcal / 100 g, in popcorn with flavorings - about 325-350 Kcal / 100 g, and in a fried product, usually more than 400 kcal.

In cooking

There are many uses for corn products in cooking.

Grains in the stage of milky ripeness can be eaten raw or boiled. Some maize varieties make great popcorn, others make great corn flakes. Canned maize is included in numerous salad recipes. Corn glucose-fructose syrup is also known in cooking, which, however, causes a critical attitude and even concerns among nutritionists and scientists.

Porridge is made from coarse flour. And when fine flour is added to cakes and puddings, they become more crumbly. Cornneal is also used to make pancakes and dumplings. This is especially true for people with gluten intolerance who cannot eat traditional wheat, barley or rye bread. However, cornneal can be a real challenge for a novice cook. It is heavy and the dough does not want to rise with it. Therefore, if you use it, it is better to deal with the finest flour.

In the cuisines of peoples around the world, you can find traditional maize dishes that have already become traditional: from Argentinean locro soup and Italian polenta porridge, to Chinese donuts and Egyptian pineapple cake. In Mexico, the beer drink chicha (chicha) is brewed from sprouted maize grains .

In cosmetology

A number of different cosmetic components are obtained from maize, but starch is considered the most demanded in the beauty industry for its absorbent capabilities and the ability to give the skin a silky smoothness. "Universal sensory modifier" is called by the manufacturers themselves. When applying cosmetics based on it, a powdery matting effect appears, due to which the skin feels dry and smooth, excess shine and stickiness disappear. Starch, instead of talc in the composition, absorbs excess sebaceous secretions and at the same time delicately polishes the surface of the skin.

In addition, starch in cosmetics acts as an emulsifier, preservative, thickener. Depending on the specific task, its concentration can reach different levels:

- in powders up to 99%,
- in creams up to 30%,
- in lotions about 0.5-3%.

Corn derivatives play other roles in cosmetics as well. Corn protein - nourishes and conditions the skin and hair. Corn alcohol esters (glycerides) - moisturize, and in combination with corn germ oil, these components protect the skin from damage and irritation.

At home, you can easily make a face mask using one tablespoon of boiled cornmeal. The slurry swollen from water is applied to previously cleaned skin areas and left for 15 minutes. After this time, the gruel is washed off with warm water without soap.

Dangerous properties of corn and contraindications

Since corn stigmas create a choleretic effect, they can provoke the movement of stones in the gallbladder and ducts. Boiled corn grains are relatively difficult to digest, so people with

gastrointestinal problems (indigestion, ulcers, increased gas formation) should use the product with caution.

Potential health risks associated with eating corn include its ability to increase blood clotting and increase blood viscosity. In addition, slowing blood flow is one of the causes of thrombophlebitis, so people with such circulatory system problems should consult a medical specialist before including corn in their diet. Perhaps a balanced diet rich in amino acids (particularly taurine) will reduce the risk.

The absence of iodine in corn grits adversely affects the state of the thyroid gland. More precisely, corn itself as a product does not increase the risk of goiter, but the forced transition to long-term corn diets in history has already led to a regional increase in thyroid diseases. In particular, in the years of famine in northern Italy, local corn porridge - polenta (polenta) - helped the locals survive due to its nutritional value, but the lack of a sufficient amount of iodine in the daily diet eventually led to a surge in diseases provoked by this factor.

But both the monotonous diet and the overeating of corn products with added sugar (cereals, "sticks", popcorn, chips) are not so much about the harmfulness of maize itself, but about abuses and extremes in matters of nutrition in general.

Glucose-fructose syrup, created from corn, also threatens, first of all, with an excess of purified fructose in the composition, which harms the brain and creates prerequisites for the formation of tumors. In addition, it "feeds" already existing tumors, which is why they grow faster. There are studies showing that such a syrup increases the risk of developing cirrhosis and fibrosis in people with fatty liver . Therefore, sugar should not be replaced with corn syrup (as is sometimes recommended).

Separate serious disputes are caused by the dependence of the risk of developing cancer on the use of genetically modified corn. The discussion was aggravated by a two-year study by French scientists who, after an experiment on rats, stated that GMOs lead to the appearance and rapid increase in cancerous tumors. According to the data presented, breast cancer was especially common in female rodents.

Throughout the study, animals were fed only genetically modified corn of the famous Monsanto brand , after which a number of countries, just in case (until the results were confirmed or denied), banned the import and cultivation of GM corn.

However, the research of the French group almost immediately after the publication was questioned and debunked. Skepticism was caused by the lack of details about the course of the experiment, insufficient information about the diet of the control groups, and the small number of rodents studied. Several other laboratories requested all information about the work carried out in order to cross-check the results.

In parallel, the collection of statistical information on the possible harm of GM products was also carried out. For this, scientific articles on the subject over the past 30 years, expert assessments, information on the ratio of the number of various diseases and the share of GM crops in the national economy (on a national scale) were raised. This study did not reveal any negative effects of GMOs on human health. On the contrary, the assertion was made that by reducing the pesticide load and increasing the vitamins in hybrids, the health of the nation has improved.

Selection and storage

When choosing corn for cooking, they are guided by several characteristics:

- 1. **Color.** Since young corn is tastier and softer, it is better to take cobs with light yellow or white kernels. The rich yellow color of the varieties common in our country indicates a high degree of maturity.
- 2. **Density.** The grains should be moderately elastic, but still quite soft to the touch. It is better if they are the same size. In good corn, they fit snugly together.
- 3. **Flaws.** "Dimples" on the grains can indicate either improper pre-sale storage of corn, or its overripeness. In any case, it is better not to take such a product.
- 4. **Leaves.** It is safer to buy corn with leaves, which ideally should still be "alive" and green, close enough to the cob.

While the corn is not cooked, its "life" can be extended to 3-4 weeks if the cobs are dipped in cold water with ice, citric acid and salt (a teaspoon per liter) for about half an hour. After that, you need to remove the grains, dry them, then send them for storage in hermetically sealed bags in the refrigerator. In the freezer, they can lie all winter.

Boiled corn is usually not stored, but if it is necessary, for example, to keep the temperature of the cob before the guests arrive, it is wrapped in foil. In the case when the boiled head still remains uneaten, it can be wrapped in cling film and put in the refrigerator. For a longer period, the separated corn grains are sent to the freezer, previously, still on the cob, by arranging a contrast dipping in hot and cold water. Before freezing, the corn is dried and laid out in bags.

When choosing canned corn, attention to the release date should be paid at least in order to understand whether fresh or frozen grains will be in the bank. As a rule, freshly harvested crops fall into canned food dated in summer and early autumn, while winter and spring packages contain previously frozen grains, which were thawed with 70-75-degree hot steam before sealing.

According to the rules, canned corn can be stored for 3 years. But after opening it should not be kept in the same metal can. If you didn't eat it right away, it's better to pour it into a glass dish, adding the remaining "brine" there, close the lid tightly and send it to the refrigerator, where it can stand for another three days without loss of quality. However, people store even sour grains, using them for fishing as bait. But even more so, they need to be closed as tightly as possible, otherwise the sour smell will permeate the rest of the products.

Varieties and cultivation

Any corn in cultivation loves the sun and warmth. Seeds germinate at least at 8-10 C, at -3 C, seedlings die. Maize is a drought-resistant crop, but for a good harvest it still needs 450-600 mm of rainfall.

There are 9 botanical groups of cultivated corn (Zea mays), 4 species, 3 wild subspecies and thousands of varieties and hybrids that differ in shape, color, size, yield, ripening time, content of various elements and other parameters.

- Sugar maize. The most common high sugar group. The cobs of this maize are yellow in color, ranging from pale to rich, almost orange. They need to be harvested before full ripening and cooked as quickly as possible so that the grains do not become "rubber" and starchy.
- Waxy maize. Varieties come with yellow, red and almost white grains. Due to the recessive " waxy gene ", varieties of this group cannot be planted next to varieties from other groups. Waxy corn is quite vulnerable to adverse factors - it often dies and does not have consistently high yields. But it is valuable for its 100% amylopectin starch.

- Tooth maize. When the grain of this group ripens, a depression appears in it, making it look like a tooth, which determines the name. Most of the cultivars are medium late or late, providing high survival and yield.
- Silicon maize. The species is hardy, fruitful, with a high starch content. Grains (from lilacchocolate to yellow) are mainly used for cereals and cereals. An alternative name - "Indian" this corn probably got because of the "mistake of Columbus", who, having landed on the shores of America, thought that he had found his way to India.
- Starchy maize. Large yellow or white grains contain up to 80% soft starch and little protein, which is why it is used mainly for the production of flour, molasses, and alcohol.
- Bursting maize. This is high-protein corn, which, when heated, breaks the peel and bursts, turning out into a white mealy lump, which determined the technology of popcorn production.
- Filmy maize. It owes its name to the scales (films) that cover the grain. This quality makes corn of this group unsuitable for the food industry and, as a result, unpopular with farmers.

There are also semi-dentate and starchy-sugar groups.

The varietal- hybrid variety of corn is extremely large, therefore, for familiarization, let's pay attention to the amazing maize, which in appearance is noticeably different from the corn we are used to.

- "Mother of Pearl Miracle" (Japanese). The plant itself, and the flowers, and the cobs look spectacular. Thanks to thick juicy stems with striped yellow-green-red-orange-pink stripes, they are often planted along walls and fences as a decorative one and a half meter hedge, and with small elongated cobs with dark red grains, designers decorate interiors after harvest.
- Glass _ Gem ", or "Kaleidoscope". When looking at the cob of this hybrid, it seems that the grains are made of glass of different colors and transparency. Moreover, the set of colors is not repeated, and therefore we can say that every time a completely unique edible and at the same time decorative product appears on the dining table. Glass _ Gem is not boiled, but excellent popcorn is made from its grains.
- "Strawberry". This variety surprises in color, size and shape. The cobs are small in length do not exceed 10 cm, have a wide base and a narrow top, which resembles the shape of a berry. The reddish-purple color is also associated with strawberries. The grains of this hybrid are small, but in the milky stage of maturity, sweet and healthy. The flour made from this corn retains a natural dye that is used in cooking.
- Peruvian black. Black corn is spoken of not only as the most ancient domesticated crop, but also as the most useful among corns. Gardeners are often impressed by the black "black" grain, and the powerful stem of the plant with purple aboveground roots and dark striped leaves. The second, "Ukrainian", name of Peruvian corn "Mama Sara" came from the name of Saramama ("mother of maize") a female deity from the mythology of the Quechua people.
- White. The grain color of these hybrids is really snow-white, which is reflected in the names of many of them: "White Cloud" used to make popcorn, "Snow Queen" has a high sugar content, "Snow Avalanche" a high-yielding hybrid with sweet and juicy grains. Thompson _ Prolific " is a starchy, hearty white corn variety known in Virginia (USA) since 1910 and very popular with American farmers.

Corn is an indispensable crop in the world economy. Starch, flour, alcohol, oil, biogas - all this is produced in sufficient quantities thanks to corn. Without it, humanity simply would not have been able to feed itself or provide food for domestic animals. But new research into the healing potential of corn may further fuel interest in this unique crop.

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Corn - useful properties, composition and contraindications

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Radish (lat. radix)

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Abstract. The article discusses the main properties of radish 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 radish in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of radish on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: radish, benefit, harm, beneficial properties, contraindications

Beneficial features

Table 1. Chemical composition of radishes (according to <u>Food+</u>).

Main substances (g/100 g):	Fresh radish [1]	Canned radish [2]
Water	95.27	91.50
Carbohydrates	3.4	5.2
Sugar	1.86	2
Alimentary fiber	1.6	2.2
Squirrels	0.68	1.1
Fats	0.10	0.30
Calories (kcal)	16	28
Minerals (mg/100 g):		
Potassium	233	333
Sodium	39	789
Phosphorus	twenty	31
Calcium	25	28
Magnesium	ten	eight
Iron	0.34	0.23

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Zinc	0.28	0.22			
Vitamins (mg/100 g):					
Vitamin C	14.8	0.0			
Vitamin PP	0.254	0.310			
Vitamin B6	0.071	0.100			
Vitamin B2	0.039	0.030			
Vitamin B1	0.012	0.020			

Radish refers to low-calorie foods and is not replete with useful substances. But even without being a vitamin-mineral bomb, it still contains a considerable amount of minerals and vitamins. If we talk about how to use it, then it is best to eat the root vegetable fresh. During canning, radishes lose some vitamins and receive an excess amount of salt - sodium.

Medicinal properties

After a long and detailed study of the composition of the radish, scientists came to the conclusion that one of its main health benefits is the content of various **phenolic compounds**. Their main value is that they provide antioxidant protection to the body ^[8]. However, their effect is not limited to this. For example, they enhance the effect of vitamin C, reduce capillary fragility, and support the normal functioning of the cardiovascular and digestive systems.

Researchers believe that anthocyanins, the plant pigments that give radishes their reddish color, have a distinct anti-inflammatory effect that can delay or prevent early onset of chronic disease. Due to their antioxidant properties, they can also protect the body from the development of certain types of cancer (intestine, stomach, kidney, mouth)^[10]. The phytochemicals indoles (especially indole-3-carbinol) also contribute to the prevention of cancer .

In addition, albeit in a small concentration, but in the radish there are polyunsaturated fatty acids (omega-3 and omega-6), which are not synthesized by our body and come only from food. Nowadays, many people do not get enough of these acids, so any source of them is an important part of the diet. They take part in many processes and have a positive effect on the activity of the nervous system. Moreover, they help lower cholesterol levels, thin the blood and, therefore, prevent the formation of blood clots. They are also associated with improved liver function.

Together with radish, coarse dietary fiber (fiber) enters the body. They improve intestinal peristalsis and thus help digested food move faster and easier to the rectum. Fiber eliminates constipation and cleanses the digestive tract, absorbing toxic elements. By the way, in one of the studies on rats, Korean scientists noticed that not only the root crop itself, but also the leaves of the plant contribute to the normalization of the stomach and intestines. ^[9]. In addition, radish stimulates the production of bile, which is also necessary for the digestion process.

Fresh radishes are often recommended for diabetics. It stabilizes and keeps the sugar level normal for a long time. This crunchy vegetable is also recommended by dentists, because, firstly, it strengthens the teeth, and, secondly, it stimulates the abundant production of saliva, which flushes the oral cavity and especially the interdental space.

In terms of minerals, radishes are the richest in potassium, which has a beneficial effect on the cardiovascular system, helping to reduce high blood pressure ^[11]. Zinc and phosphorus in combination with vitamin C help improve skin condition. And calcium, together with folic acid, is especially useful for women during pregnancy, as they ensure the correct formation of the nervous and musculoskeletal systems of the child.

Finally, radishes are considered an effective natural diuretic. Due to this property, it is able to cleanse the kidneys of toxic elements. With inflammation of the genitourinary system, root juice can reduce pain symptoms that occur during urination.

Use in medicine

To date, radish is not used in the manufacture of medicines, however, scientists believe that this root crop has potential. The World Health Organization and the International Agency for Research on Cancer have long been conducting a large-scale study in which they monitor patients with a high risk of developing cancer who eat certain vegetables. Then experts evaluate how the product affects the containment of the disease.

It turned out that the biologically active substances contained in the radish show promising results in relation to colorectal cancer. Scientists hope to create a series of drugs based on them, which, in comparison with synthetic drugs, will have fewer side effects.

Also in pharmacies, you can find nutritional supplements based on sulforaphane and indole-3-carbinol (chemicals more often extracted from broccoli, less often from radishes). They are credited with a lot of miraculous effects: from painless weight loss to cancer treatment, but you should be careful and consult a doctor before using these drugs.

In folk medicine

• Roots

According to traditional healers, radish can help to cope with varicose veins in the early stages. Root vegetables are crushed to a puree state, mixed with a small amount of lemon juice and rubbed into the skin. The course of treatment is 3 weeks. In addition, gruel from crushed radish is applied as compresses for pain caused by sciatica and neuralgia. A grated radish, mixed in equal proportions with hot water, can be useful for mild frostbite. Before applying such compresses to the affected areas, the liquid must be cooled.

Another way of external use of root crops is the fight against discolored areas of the skin with leukoderma (disturbance of skin pigmentation, expressed in the form of rounded light spots). Sliced \u200b\u200bvegetables should be dipped in vinegar or ginger juice and applied to the skin.

As for internal use, it is believed that the radish can tidy up the digestive system and get rid of indigestion. To achieve this effect, it is necessary to grind 5-6 root crops, mix them with one teaspoon of starch and 200 ml of milk. The mixture should be drunk immediately after preparation. To improve metabolism, take 50 g of dried radish, pour 200 ml of water over them and put in a water bath for 20 minutes. Then cool, strain and take 50 ml three times a day for 30 days. In addition, healers claim that the use of fresh radish helps to maintain potency in men.

According to the recipes of traditional medicine, radish infusion helps to improve the condition of anemia. To prepare this healing remedy, you need to take a jar of dark glass, pour 50 g of dried root crop into it, add 100 ml of vodka, close and insist for two weeks. After that, strain the resulting tincture through cheesecloth and add the same amount of water. Take 20 ml at bedtime for one month.

• Leaves

Radish tops are mainly used for liver problems or for preventive cleansing of this organ. One of the most popular remedies is a decoction of the young leaves of the plant. A bunch of washed greens is cut

into large pieces, poured with two glasses of water and put on fire. Cook this mixture until half of the liquid has evaporated. Then some sugar is added to it and consumed instead of water. The same decoction is advised to take with jaundice and hepatitis. Only with these diseases, bean-based soup with dried tops and radish root must be added to the diet.

An effective remedy for burning in the liver, folk healers call tea from radish leaves. They are washed and brewed with boiling water, adding sugar. However, the factors that cause burning can be very different and it is best to consult a doctor first to find out the causes of pain.

In addition, radish tops are also used in the fight against atherosclerosis. The leaves, ground to a puree state, are mixed with honey in equal proportions and taken 2 teaspoons twice a day for two weeks.

• Juice

Radish juice is actively used to treat various ailments in the Middle East, but our traditional healers have recently often used it in the preparation of their remedies. It should be noted that this juice itself is too concentrated and has a strong irritant effect on the mucous membranes of the digestive organs, so it is usually mixed with other liquids.

For example, it is believed that small stones can be removed from the gallbladder thanks to a mixture of radish and beet juice. Carrot- radish cocktail helps to restore the normal functioning of the mucous membranes of the gastrointestinal tract. And the combination of radish juice, cucumber and bell pepper alleviates the symptoms of respiratory diseases. During the period of exacerbation of bronchial asthma, it is advised to mix 100 ml of juice and 20 g of honey and take this remedy 2 teaspoons three times a day.

For colds, traditional healers advise drinking a mixture of radish and onion juices with honey. Some healers believe that radish juice mixed with black salt lowers body temperature and will be effective during a fever.

In addition, it is believed that radishes have anti -itch properties and may be helpful for insect bites. It is recommended to lubricate the affected areas with root juice in order to reduce swelling and burning.

in oriental medicine

Unani system of traditional medicine, adopted by the Arabs from the ancient Greeks, and in Indian Ayurveda, radish has long been used to treat jaundice, gallstones, liver diseases, rectal prolapse (rectal prolapse) and indigestion^[12].

Ancient Chinese healers attributed radishes to "warming" foods and correlated them with the meridians of the lungs, spleen and stomach. They believed that this root vegetable stimulated the flow of vital Qi energy, so it was added to many herbal medicines either fresh or dried. Juice was also extracted from it. It was believed that the radish helps to eliminate excess mucus from the body, so it was used to treat respiratory diseases. He also treated almost all problems of the gastrointestinal tract.

Modern folk healers of the East endow the root crop with rejuvenating properties due to its ability to "warm up" the body and improve digestion.

In scientific research

A number of studies demonstrate the effectiveness of some biologically active components from the composition of the root, in particular sulforaphane, in suppressing the development of cancer cells in

the human body. Moreover, experiments carried out outside a living organism (in vitro), it was proved that the extract of these compounds not only slows down the development, but also causes the destruction of pathogenic cells ^[3]. This substance is especially effective in the fight against breast cancer ^[6].

Ohio University researchers have also found that some of the compounds found in radishes could potentially be used to treat cancer. In their experiment, they introduced into the diet of rats infected with colon cancer, anthocyanins - a natural dye that determines the color of the radish. As a result, a 50-80% decrease in tumor growth rate was recorded compared to a control group of rodents that did not receive any dietary supplements ^[4].

By the way, with regard to the already mentioned sulforophane, it has not only anti-cancer properties. Scientists believe that due to its anti-inflammatory and antioxidant properties, it makes a significant contribution to the body's defense against cardiovascular diseases that develop due to oxidative stress ^[5]. Interestingly, this substance is formed in radishes solely as a result of mechanical damage (cutting, chewing) and the chemical reactions that follow.

Among other things, scientists have found that the root vegetable has an antidiabetic effect. This effect is associated with the ability of its components to enhance the mechanisms of antioxidant defense of the body, reduce the level of oxidative stress and oxidative degradation of lipids. In addition, they help to improve the absorption of glucose and, in general, have a beneficial effect on energy metabolism. Moreover, scientists believe that radish seeds and leaves can be useful not only as a preventive agent, but also in the case of already developed diabetes ^[7].

Weight regulation

Radishes are a low-calorie vegetable, which is why they are often included in weight loss diets. There are even so-called mono -diets, which involve eating only root crops. It should be noted right away that nutritionists are skeptical of this option, since it can cause problems with the kidneys and gastrointestinal tract, and also deprives the body of nutrients from other foods.

In addition to the fact that radishes contain a minimum amount of calories, they also have a low glycemic index - they do not increase blood sugar levels. Moreover, this root crop fills the body with coarse dietary fiber. Firstly, they contribute to the establishment of metabolism, and, secondly, they bring a long-lasting feeling of satiety.

However, uncontrolled consumption of radish alone will not lead to a magical loss of extra pounds, but can cause significant harm to the body, so it is enough to include 4-5 salads from this vegetable per week in your menu. Experts recommend combining it in salads with other low-calorie but healthy ingredients like leafy greens, cucumbers, celery or apples. By the way, mustard oil, which gives the vegetable a piquant taste, increases appetite, so it is better to use less spicy root vegetables in diets.

It must also be understood that getting rid of excess weight occurs only through an integrated approach that includes a healthy diet and active physical activity.

By the way, experts also included radishes in the now popular DASH diet, which was developed specifically for hypertensive patients in order to reduce pressure. In addition to the main effect, it turned out that this diet contributes to the normalization of weight and stabilizes sugar levels. Such a diet is balanced in the content of important components such as proteins, minerals and dietary fiber. The emphasis is on drinking enough fluids, vegetables, fruits, grains and legumes. Limit the consumption of sweets and fats.

In cooking

Radishes do not enjoy the popularity of such vegetables as tomatoes or onions, but are known in almost all corners of the world, including ours, where it is traditionally added to okroshka. In general, the root crop is used both as one of the components of various salads, and as a self-sufficient snack, and sometimes even as a side dish for meat dishes. Sauces are also made on the basis of radishes. The most common use of a vegetable is fresh, but it is also fried (like french fries), pickled, canned, stuffed (with meat, mushrooms, cheese) and baked. Surprisingly, inventive housewives even prepare marmalade from this root crop.

To prepare this unusual dessert, 250-300 g of radish must first be left in cold water for 30 minutes, and then boiled over medium heat for 30 minutes. Note that in hot water, the vegetable will lose its bright color, but this will not affect the taste of the dish. Mash the boiled radish with a fork and add a grated sour apple to it. Add half a glass of vanilla sugar to the resulting mixture and leave on low heat for 2 hours. At the end, add cinnamon and orange zest to taste. If the marmalade turned out to be thick, it can be laid out in molds and cooled; if it looks like jam, it can be spread on toast or crackers.

Among the most popular snacks, radishes with cottage cheese can be distinguished. It is done very easily: grind the root crop, add cottage cheese, sour cream, herbs, salt, spices and mix. By the way, it is customary to serve radish snacks before main courses, as this vegetable can increase appetite. As for sauces, a recipe is suitable for dressing summer salads, according to which you need to knead 2 boiled yolks, add 200 g of sour cream, 4-5 radishes, half a pickle, green onions, parsley and half a teaspoon of mustard to them. Then mix everything in a blender. By the way, sometimes garlic is replaced with radish in Caesar salad - it, like garlic, adds spice, but does not leave a specific smell.

It is interesting that usually in cooking they use the roots themselves directly, without using the leaves of the plant in any way. Recently, however, radish tops are gaining more and more popularity, especially among vegetarians. She, like the root crop itself, is rich in vitamins and minerals and is gradually absolutely deservedly included in the diet of a healthy diet. It can be added to vegetable soups, green borscht, salads (instead of arugula or iceberg), as well as stewed and served as a side dish.

Note that when buying radishes in winter, you may encounter the fact that root crops are devoid of the usual piquancy. The thing is that in the cold season this vegetable is imported from hot countries (Armenia, Israel), where it is often and abundantly watered, which is why the concentration of mustard oils in its composition decreases and, accordingly, the level of sharpness decreases.

In cosmetology

Due to the successful combination of alkaloids, polyphenols, a complex of enzymes and other useful substances, radishes are actively used both in professional and home cosmetology. In the manufacture of eco-products containing exclusively natural ingredients, the use of radish root filtrate fermented by lactic bacteria has become especially popular.

Due to its antiseptic and fungicidal properties, it has become a healthy alternative to parabens, which act as preservatives and prevent the growth of bacteria and mold in cosmetics. It does not irritate even sensitive skin. Today, this natural preservative can be found in many skin care products. For example, the German brand Judith Williams or Indonesian - By-cosmetics.

As for homemade products, there are a large number of different recipes. For the most part, radishbased masks are designed for oily skin, as well as in the fight against acne . Here is some of them:

- *for oily skin.* Mix 50 ml of milk and 10 root vegetables chopped with a blender. Apply to face and leave for 30 minutes, then rinse with warm water;
- about *acne*. Mix 3 tablespoons of radish, chopped in a blender, with one teaspoon of honey and one teaspoon of calendula tincture. Apply a thick layer on problem areas, leave for 30 minutes, then rinse with warm water.

In cosmetology, as in cooking, not only the roots of the plant are used, but also its ground part. For example, the leaves are often added to a nourishing mask suitable for all skin types. To prepare it, you need to mix a tablespoon of chopped tops, 6 drops of olive oil and one teaspoon of starch. The mixture is left on the face for 10 minutes, then washed off with warm water.

In addition, it is believed that radish leaf juice can be used in masks aimed at whitening the skin of the face and getting rid of age spots. According to the recipe, you should mix one tablespoon of parsley juice, cucumber, radish greens and one tablespoon of sour cream. Keep on face for about 15 minutes, then rinse with warm water.

Dangerous properties of radish and contraindications

Undoubtedly, the radish root is incredibly useful, but even for it there are contraindications. No matter how strange it may sound, but precisely because of its beneficial antiseptic and bactericidal properties, radishes are not recommended for:

- exacerbations of diseases of the gastrointestinal tract;
- inflammation of the thyroid gland;
- ulcer and pancreatitis;
- intestinal infections;
- hypervitaminosis and goiter;
- irritation of the mucous membrane and gastritis;
- exacerbation of diseases of the liver and kidneys;
- cholecystitis.

Radish increases irritation of the mucosa and enhances the secretion of pancreatic enzymes, which are already sufficiently irritated due to the above diseases. In non-acute forms of these diseases, it is allowed to eat portions of no more than 100 grams.

In addition, it is recommended to refrain from eating radishes after a heart attack. The essential oils contained in the root crop can stimulate an increase in heart rate and thereby put an increased burden on the heart. Moreover, oxalic acid prevents the complete absorption of calcium, which is necessary for the normal functioning of muscles, including the heart. Thus, it is necessary to allow the body to recover from the illness, and only after a few months begin to gradually return the vegetable to the diet.

Selection and storage

The choice of a root crop should begin with an inspection of the skin: it should be smooth, even and whole - without cracks, which indicate that the vegetable was grown without sufficient moisture. Do not take radishes with black spots, as they indicate rot. You also need to feel the root crop, check its surface for "breakdown" (a good radish will be hard, and an overripe one will be soft). It is best to choose radishes with leaves, as green tails are the best indicator of freshness.

It is believed that radishes easily absorb nitrates, which unscrupulous growers use to feed plants to speed up maturation and increase yields. Indeed, the very first radish may not be very "clean", but

experts say that you can get poisoned by eating about a kilogram portion at a time. So, in general, you should not abuse the first root crops, but you do not need to completely abandon them either.

There are several ways to store radishes:

- at room temperature;
- in a refrigerator;
- in a jar of water;
- in the cellar;
- in dried form.

The first method is suitable for those who are not going to put off eating radishes indefinitely: at room temperature, they will lie for several days. Do not trim the tops, because this way the edges can become weathered, thereby depriving the radish of taste. But for storage in the refrigerator, it is better not to leave the ponytails, as they will quickly draw moisture out of the root crops. By the way, it is advisable not to wash the radish before placing it in the cold, so it will lie for about a week. When putting radishes in a bag, you can moisten it a little and the main thing is not to tie it, but simply roll it up - additional cuts or holes in the package will create good ventilation conditions.

The method of storage in a jar of water allows the vegetable to live for several months, but at the same time its usefulness is partially sacrificed. The algorithm of actions is as follows: collect cool boiled water in a jar, put the radishes peeled from the tops, put in the refrigerator and change the water every 4-5 days. Many also store dried radishes. The chopped vegetable should be boiled in salted water, and then dried in the oven. Then send in a bag or cloth bag. This type of radish will be stored in the refrigerator for several months, but, unfortunately, we are no longer talking about the presence of useful substances in it.

Cellar storage is the best way to stock up on radishes for the winter. To do this, fill the bottom of a wooden or plastic box with sawdust or sand, put the radish on top in one layer, then sand again. Rows can be alternated to the very top of the box. Please note that the root crops must be previously cleaned of tops and dirt, but in no case washed. The top layer should consist of sand or sawdust and completely cover the vegetables. During storage, you need to monitor the condition of the radish, controlling the level of humidity and removing rotting vegetables.

Varieties and cultivation

Radishes are considered to be one of the fastest vegetables, as it can take only 18-20 days from planting a seed to the first harvest. Compared to other crops, radish farming is not very complicated. It is important to choose the right variety, since the ripening of root crops depends on the length of daylight hours in a particular area. An important role is played by the quality of soil preparation and the intensity of irrigation.

For early sowing, it is preferable to choose soil on the southern slopes. Since autumn, it is advised to add 3-4 kg of humus, a little phosphorus and potash fertilizers there, and in the spring you can add a little nitrogen (at the rate of 10 g per 1 square meter). The soil should be loose, and the planting should not be too thick (3-6 cm between plants and 10-12 cm between rows). Watering should be regular, but moderate, since an excess of moisture leads to damage to the radish with a black leg, and a lack of it leads to cracked fruits of a non-standard shape.

As for the varietal diversity of radishes, there are two large groups: *European varieties* and *Sino-Japanese*. The first usually bring a crop in the year of sowing, and the second takes two years to start

fruiting. European radish is more common in our open spaces, and among the most popular are the following varieties:

- Early ripe "Early Red" with good watering gives root crops weighing up to 120 g. The flesh is crisp and moderately spicy.
- ripening variety "**Rebel** " bears small fruits weighing up to 20 g with a pronounced spicy taste and smell;
- ripening "**Red Giant**" gives fruits of a rounded shape with crispy and very juicy pulp. Reaches a weight of 200 g. It grows well at a temperature not exceeding 25 degrees.

If we talk about unusual species, then in no case should we miss the "watermelon" radish, which is now at the peak of popularity. It differs from the usual root crop in its appearance: the peel has a light green or white color, and the core is scarlet. At the same time, its taste is bitter on the outside, and sweet on the inside. Radishes of the Zlata variety are also distinguished by a special "appearance". Root crops have a bright golden color and a rough surface. There are also white and purple radishes. A special form of radish varieties "18 days" is cylindrical.

In general, if there are no medical contraindications, then radish definitely needs to be introduced into the diet. Firstly, this low-calorie vegetable is suitable even for those who are on a diet. Secondly, the radish will provide the body with many nutrients and vitamins, as well as enhance the mechanisms of antioxidant defense and protect cells from premature aging and damage.

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Radish - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of radish 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 radish in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of radish on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application.



Plum (lat. Prúnus)

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Abstract. The article discusses the main properties of the plum 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 plums in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially

adverse effects of plum on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its application are considered.

Keywords: plum, benefit, harm, beneficial properties, contraindications

Beneficial features

Basic substances (in 100 g)	Fresh plums ^[2]	Dried plums (prunes without further processing) ^[3]	Dried plums (boiled prunes, no added sugar) [4]	Dried plums (boiled prunes with added sugar) ^[5]	Canned plums in syrup ^[6]
Water	87.23	30.92	69.73	65.08	76.06
Carbohydrates	11.42	63.88	28.08	32.88	23.12
Squirrels	0.7	2.18	0.96	1.09	0.44
Fats	0.28	0.38	0.16	0.22	0.14
Alimentary fiber	1.4	7.1	3.1	3.8	1.5
Calorie content (kcal)	46	240	107	124	89
Minerals (mg/1	00 g)				
Potassium	157	732	321	312	93
Phosphorus	16	69	thirty	33	fifteen
Magnesium	7	41	eighteen	19	5
Calcium	6	43	19	21	ten
Iron	0.17	0.93	0.41	1.04	0.84
Zinc	0.1	0.44	0.19	0.22	0.07
Sodium			one	2	19
vitamins (mg/1	00 g)				
Vitamin C	9.5	0.6	2.9	2.7	0.4
Niacin	0.417	1.882	0.723	0.675	0.291
Vitamin E	0.26	0.43	0.19		0.26
Vitamin B-6	0.029	0.205	0.218	0.203	0.028
Thiamine	0.028	0.051	0.024	0.022	0.017
Riboflavin	0.026	0.186	0.1	0.093	0.041
Vitamin A	0.017	0.039	0.017	0.014	0.02
Vitamin K	0.0064	0.0595	0.0261		0.0064
folate	0.005	0.004			0.003

Table 1. Chemical composition of plums (according to Food+).

Due to the high water content in the plum pulp, the calorie content of the fruit is relatively low. In canned form, the calorie content of products from plums (including prunes) increases significantly.

In general, the amount of vitamins and minerals found in fresh plums and prunes differs little. The content of vitamin K, B vitamins, individual minerals in prunes is higher than in fresh plums. Compared to fresh fruits, prunes have more calories, fiber and carbohydrates.

Fresh plums (fruits) contain 6-17% sugars (with a predominance of glucose and fructose), up to 1.6% organic acids (malic, citric, oxalic, succinic, quinic), diphenylisatin , pectins, flavonols (quercetin ,

isoquercitrin), anthocyanins and leucoanthocyanins , carotene, vitamin E, ascorbic acid, B vitamins, potassium, iron, iodine, copper, and zinc compounds. Kernels of bones contain up to 42% fatty oils.^[7]

Plum leaves contain vitamins E and C, flavonoids , phenol carboxylic acids. The composition of plum flowers includes flavonoids , cyanogenic glycoside, flavonoid glycoside kaempferol and kaempferin , homoisoflavone glycosides prunosides . ^[eight]

Medicinal properties

Plum fruits in fresh and dried form (also compotes from them or juice with pulp) have a slight laxative effect. They are recommended for constipation and intestinal atony, for cleansing the intestines in the presence of inflammatory processes in it. If these diseases are accompanied by diabetes mellitus or obesity, before eating the plum, it is necessary to get rid of sugar and acids during the processing. With non-infectious hepatitis, plums are useful for the liver; they improve the condition of patients with atherosclerosis; contribute to the removal of cholesterol, excess water and salt deposits from the body. The content of dietary fiber (both soluble and insoluble) in plums improves digestion. Pectins in plums remove radioactive substances. The fresh bark of the plum tree is used in homeopathy. ^[7]

Use in medicine

The pulp of plums is part of the pharmacy combined laxative "Kafiol ". In addition to this component, the preparation also contains crushed leaves and fruits of senna, figs and vaseline oil. "Kafiol " refers to drugs that cause chemical irritation of the intestinal mucosa. It has a number of contraindications: proctitis, hemorrhoidal disease in the acute stage, intestinal obstruction, perforated ulcer, spastic colitis and constipation, disorders of water and electrolyte metabolism, etc.

In folk medicine

- A recipe is used as a laxative: remove the stones from the plums and pour cold boiled water over night. In the morning, boil the fruits for an hour, adding hot water as the liquid evaporates. Then drain the decoction and consume boiled plums before each meal (about 10 pieces at a time). ^[7]
- To strengthen the immune system, a decoction is useful: pour 20 g of finely chopped plum leaves into 250 ml of boiling water and boil over low heat for half an hour. Strain and drink ¹/₄ cup three times a day before meals.
- In inflammatory processes in the kidneys, a drug from the bark of a plum tree is used: pour 10 g of crushed bark with a glass of boiling water and cook a decoction in a water bath for half an hour. Strain, increase the volume by adding 50 ml of boiling water and drink ¹/₄ cup three times a day before meals.
- For constipation, an infusion is prescribed: rinse plum tree branches (50 g) well, chop, pour 0.5 liters of boiling water, let it brew for 2 hours. Strain and drink 50 ml up to three times a day.
- For gastritis (with low acidity), a recipe is useful: immediately before use, mix the juice of homemade plums, prickly plums (thorns) and honey (in proportions 4:2:1). Take the composition of a tablespoon three times a day. Such treatment is contraindicated in diabetes.
- To improve the functioning of the digestive tract, dry plum flowers (25 g) pour 250 ml of hot water. Let it brew, strain and drink the infusion ¹/₄ cup three times a day before meals. ^[9]
- Traditional healers offer to dissolve and remove stones from the gallbladder using the resin (gum) of the plum tree. 100 g of resin should be dissolved in 1 liter of dry white wine. Drink 50 ml three times a day half an hour before meals. It is noteworthy that this recipe is mentioned as early as The Complete Herbalist (1653) by N. Culpeper .

Externally:

- For stomatitis, rinsing with a decoction of plum leaves is recommended: pour 20 g of dried leaves with a glass of boiling water, boil for a quarter of an hour and then add boiled water, bringing the volume of liquid to the original.
- Alcohol tincture on plum pits helps with sciatica: split the pits. Grind the plum kernels to a powder state (25 g will be needed in total) and pour a glass of vodka. Let it brew for a week and strain. This tincture rub the inflamed areas of the back.
- With an advanced form of weeping eczema, traditional healers advise vinegar decoction of plum leaves. Combine half a glass of vinegar (wine, fruit) with the same amount of boiling water and bring to a boil. Pour a glass of finely chopped fresh plum leaves into the vinegar broth and let it boil again. Infuse for one hour in an enamel bowl under the lid. Soak a gauze bandage with cooled broth and apply to damaged skin. After 10 minutes, wash the sore spot with warm boiled water and lubricate with propolis ointment. ^[9]

in oriental medicine

In Indian medicine, plums are included as one of the main components in the composition of drugs used in the treatment of gynecological diseases (leucorrhea, unstable cycle, pregnancy failure).

In Chinese folk medicine, plum fruits are used as a remedy for vomiting, and an expectorant effect is also attributed to the plum .

In scientific research

The scientific interest in the study of the medicinal properties of plums is due to the high content of phenols in its fruits, mainly anthocyanins, which are natural antioxidants.

In the work of Igve E., Charlton K., the connection between the use of plums and the improvement of cognitive function (in particular, a positive effect on memory and related processes) is substantiated. In addition to the above and antioxidant properties, the relationship between the inclusion of plum fruits in the diet and the reduction of risk factors for cardiovascular diseases is emphasized.

The anti-inflammatory, analgesic, antibacterial and anti-cancer properties of plum gum are analyzed in a study by Nazar W., Raza A. et al.

University studies (Oklahoma, Florida) have proven the benefits of dried plums for strengthening bone tissue. Regular consumption of dried plums in the diet directly increased bone density, and a positive effect was found in cases of fractures and osteoporosis.

A number of scientific papers emphasize the following: the chemical composition of the plum fruit makes it possible to use this fruit as a source of raw materials for the production of antioxidants in the food industry. ^[10,11]

Weight regulation

Low-calorie plum can become the basis for both a one-component express diet (designed for 2-3 days) and fasting days (during which water and unsweetened green tea are also used). In the absence of contraindications, plum juice is included in the diet.

The biologically active compounds contained in plum fruits help in the fight against metabolic syndrome. Flavonoids and phenolic components such as anthocyanins, chlorogenic acids, quercetin

and catechins counteract obesity by inhibiting the growth of fat cells. A study from the University of Liverpool (Institute of Psychology and Health) concluded that eating prunes as part of a weight management diet actually speeds up the weight loss process. ^[one]

In cooking

Plum is a fruit universally used in the field of cooking, which is used both in confectionery and in additives to meat dishes.

- Compotes, preserves, jams, marmalade, confitures are cooked from fresh plums, fruit puree, marmalade and marshmallow, candied fruits are made. Pectins and pectin -like substances contained in plums have high gelling properties. Plums are prepared as a side dish for meat, they are added to fruit salads and pastries. Plums are dried, frozen (with or without pits), pickled.
- Dried plums (prunes) are used in compotes, for snacks and desserts, in combination with stewed or baked meat. Varieties, the fruits of which are used for drying, the manufacture of dried fruits, must have a high content of solids and sugars. The pulp of suitable varieties for this is dense, and the stone is small.
- Spicy and sweet and sour sauces (plum chutney, tkemali) are prepared from certain varieties of plums. In various recipes, plums go well with many spices: cloves, allspice, cinnamon, nutmeg, vanilla and even garlic.

Spicy plum sauce

Ingredients: 3 kg of plums, 50 g of garlic, 15-20 g of basil greens, 100 ml of vegetable oil, 5-7 g of ground cinnamon, 150-200 g of sugar, salt and ground pepper to taste. Wash plums and remove pits. Put the fruits in a saucepan and simmer over low heat until they become soft. Then wipe the stewed plums through a sieve. Crush the garlic, chop the greens. Mix vegetable oil, salt, pepper, spices, sugar, herbs and garlic with plum puree. Boil the sauce over low heat for 25 minutes, stirring occasionally. Pour hot sauce into sterilized jars and close.

- **How to quickly peel plums?** Wash the plums, on the surface of the fruit (in the place opposite the location of the stalk), make small cross-shaped cuts with a knife. Boil water, dip the plums in boiling water for half a minute, then immediately transfer the fruits to ice water (with ice cubes), also for half a minute. After that, pry off the peel in the area of \u200b\u200bthe incision the drain will be easily cleaned.
- To keep the fruits fresh longer, plums should not be washed in advance, but immediately before use.
- In order for the plucked, but slightly unripe, plums to ripen, the fruits must be put in a paper bag with bananas (or apples), wrapped tightly and left for a couple of days. Ethylene released by bananas will speed up the ripening process of plums. ^[1,9]

Beverages

- A lot of both alcoholic and non-alcoholic drinks are prepared from plums, and often the national plum drink becomes one of the gastronomic calling cards of the country.
- Xuan plum sweet and sour tea is popular in China Meitan, a soft drink that is rarely dispensed with in the summer.
- Demson Gin is a British plum liqueur. It takes pride of place in the list of gifts that are customary to give at Christmas.

- Jercam is a traditional alcoholic drink from a range of light fruit wines, plum cider, which made the area famous in Worcestershire, England. Jerkam is also prepared from other stone fruits: peach, nectarine, apricot.
- Slivovitz is a famous plum brandy, the production of which is widespread in Central and Eastern European countries (Czech Republic, Hungary, Slovakia, Poland, Serbia, etc.).
- In Japan, the traditional plum liqueur is called umeshu. Umeshu is served with ice, mineral water, added to cocktails.
- Slivyanka is a popular plum liqueur, for the preparation of which you can count more than one prescription option.

Slivyanka at home : fill a bottle with plums of the "Hungarian" variety and pour vodka so that it completely covers the fruits. Keep the bottle covered tightly with a lid in a dark place for 6 weeks. Then drain the vodka, and cover the plums with sugar (in quantity - "how much will go in"). Close the bottle tightly and infuse for 2 weeks. Then drain the resulting syrup and mix it with the previously drained vodka infused with plums. Filter the filling, pour into containers and cork. Store in a cold place, the exposure period is at least six months. ^[12]

Plums in winemaking

Varieties like "Hungarian" are suitable for making wine . Of the white plums, only plums with low acidity and plums of the early ripening type are unsuitable. Plums make excellent dessert wines. The difficulty for the winemaker is that the plum is a fruit that is hard to "give" the juice, so the plums must be pre-processed. Plum wine is opaque, cloudy, and needs to be clarified. The longer you store plum wine, the better it tastes. ^[13]

In cosmetology

Plum-based cosmetics use plum juice or ripe fruit pulp.

Plum face masks for dry skin

Option 1

Nourishes, softens and tones dry skin with the following recipe: grind one egg yolk with a teaspoon of plum juice. Apply the mixture on the face, after 20 minutes, rinse with warm and then cool water.

Option 2

A mask is useful for dry skin: peel and puree one ripe plum . Put the mass on your face (previously lubricated with a nourishing cream) and wash off after a quarter of an hour.

Plum masks for normal skin

Option 1

Puree the peeled ripe plum fruit, mix with a tablespoon of cottage cheese or sour cream, and apply the mass on the face. Wash off after 15 minutes with room temperature water.

Option 2

To prepare a nourishing mask, grind until smooth a tablespoon of butter, one yolk, a teaspoon of honey and a tablespoon of plum puree. Keep the mask on the face for half an hour, then remove the residue with a soft paper towel or cotton pad (this mask is also suitable for dry skin).

Mask for oily skin: peel and puree soft ripe plums . Mix plum puree with one beaten egg white and apply the mass on the face. Wash off with warm water after 20 minutes.

Tones, rejuvenates the following mask: mix egg yolk, 4 tablespoons of plum puree, 0.5 teaspoon of honey and 2 tablespoons of grated oatmeal. Apply a homogeneous mass on the face, décolleté, neck and hands. Wash off the mask after 20 minutes.

For any skin type, a procedure is recommended: moisten several cotton pads or a layer of cotton wool in 100 ml of ripe plum juice and apply such lotions to the face. After a quarter of an hour, wipe your face with a clean sponge with light movements.^[1]

To cleanse the body

Plum fruits are used in a variety of detox recipes that work to cleanse the body of accumulated toxins and toxins.

Plum smoothie with cinnamon

For cooking you will need: 3 large plums, pitted and finely chopped, a quarter cup of apple juice, a quarter cup of blueberries, half a teaspoon of cinnamon and ice cubes. Grind all ingredients in a blender until smooth. The calorie content of such a smoothie is approximately 115 kcal.

A decoction of prunes and raisins also gives a good cleansing effect. [fourteen]

Dangerous properties of plums and contraindications

Plums are not recommended for people suffering from obesity, diabetes; prone to low blood pressure (hypotension). Sour varieties of plums are contraindicated in gastritis with high acidity (hyperacid), gastric or duodenal ulcers.

During the drying process, prunes are treated with sulfites (to prevent the oxidation of phenols in fruits). Therefore, the use of prunes can cause serious allergic reactions in patients with hypersensitivity to sulfite substances, up to anaphylactic shock.

It is important to remember that the use of plums before a diagnostic test for carcinoid tumors can lead to a false positive result: this type of tumor provokes an increase in the level of serotonin in the blood, and plums contain a significant amount of this substance.

Early childhood is also a contraindication to the intensive and systematic inclusion of plums in the diet (plum puree is allowed in a small amount). ^[1,7,8]

Selection and storage

It is best to pluck plums when the fruits are 4-5 days from the stage of final maturity. When buying, preference should be given to still sufficiently elastic plums with a waxy coating. Fruits with a thin skin have a very short shelf life. It is advisable to store plums in a plastic bag with small holes in the vegetable and fruit compartment of the refrigerator. The average shelf life of unripe fruits in such conditions is up to 20 days. Prunes are stored in glassware or linen bags in a dry and cool place. ^[one]

Varieties and cultivation

The plum tree is moderately demanding on lighting and, compared to other stone fruits (peach, cherry, apricot), is a more shade-tolerant plant. European varieties of plums are characterized by a high need for moisture and intensive watering, since their formation took place under conditions of fairly abundant moisture. Along with this, plum species such as blackthorn and Canadian plum are drought-resistant. Plum grows well on various types of soil. However, highly productive plantations of this crop can be created in fertile areas, on soil with favorable physical characteristics. Salt, waterlogged, stony soils clogged with rubble or lime are unsuitable for growing plums. Loamy chernozem, sod-alluvial and chestnut soils are suitable for plum. One of the most important factors is the thermal regime. It should be remembered that the area of plums is limited primarily by temperature conditions. Plum is a heat-loving plant (varieties of the Ussuri plum are less susceptible to cold). According to the degree of winter hardiness, all plum varieties are grouped into low, medium and relatively winter hardy.

According to the ripening period of fruits, plum varieties are divided into **early** (Early blue, Apricot, Renklod Franz Joseph), **medium** (Renklod Altana, Moldavian blue, Mirabell Nancy, Kirk, Jefferson) and **late** (Hungarian ordinary, Anna Shpet, Renklod Bove).

One of the most significant varietal differences is the taste of the fruit. It depends on the presence and harmony of the combination in the fruits of various substances, primarily sugars and organic acids.

Based on the taste of fruits, varieties are conventionally divided into three groups:

- 1. **dessert** (fruits with high palatability) Renklod Altana , Montfort , Mirabell Nancy, Renklod Briangston , Hungarian Italian, Anna Shpet , Peach, Splendor ;
- 2. **table** (fruits with a good or satisfactory taste) Hungarian ordinary, Renklod reform, Edinburgh , Moldavian blue, Apricot. The taste of the fruits of these varieties is estimated by a score of 3.5-4;
- 3. **technical grades** Prunes Kozlovsky, Big blue, Niagara, Renklod purple. The fruits of these varieties received a taste rating of no higher than 3.5 points at tastings.

It should be noted that the taste qualities of fruits in almost all varieties change significantly over the years. This is due to more or less favorable weather conditions throughout the year. Warm, sunny, moderately humid weather during fruit ripening contributes to the formation of high taste characteristics. ^[16]

In modern fruit growing, plum is a fruit crop that is cultivated in almost all countries of the world. Plum fruits are distinguished by a rich chemical composition, high nutritional value and excellent taste characteristics.

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An extended HTML version of this article is available on the edaplus.info website.

Plum - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of the plum 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 plums in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of plum on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With her application.



Eggplant (lat. Solánum melongena)

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Abstract. The article discusses the main properties of eggplant 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 eggplant in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of eggplant on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: eggplant, benefits, harm, beneficial properties, contraindications

Beneficial features

Main	Erech aggnlant [1] Cannad Eggnlau		Boiled eggplant
substances (g/100 g):	Fresh eggplant [1]	Canned Eggptant [2]	[3]
Water	92.30	86,90	89.67
Carbohydrates	5.88	9,77	8.73
Sugar	3.53	4.80	3.20
Alimentary fiber	3.0	2.5 _	2.5
Squirrels	0.98	0.90	0.83
Fats	0.18	0.70	0.23
Calories (kcal)	25	49	35
Minerals (mg/100 g):			
Potassium	229	12	123
Sodium	2	1674	one
Phosphorus	24	9	fifteen
Calcium	9	25	6
Magnesium	fourteen	6	eleven
Iron	0.23	0.77	0.25
Zinc	0.16	0.23	0.12
Vitamins (mg/100 g):			
Vitamin C	2.2	0.0	1.3
Vitamin PP	0.649	0.660	0.600
Vitamin B6	0.084	0.140	0.086
Vitamin B2	0.037	0.070	0.020
Vitamin B1	0.039	0.050	0.076
Vitamin A	0.007	0.015	0.011
Vitamin E	0.30	0.03	0.41

Table 1. Chemical composition of eggplant (according to Food+).

Complete chemical composition of eggplant and nutritional value

It should be noted that in the process of processing, the concentration of valuable potassium, which works to ensure the cardiovascular system and remove excess fluid from the body, drops especially noticeably. This makes eating raw (in salads) or stewed eggplant more preferable. During canning, some of the vitamins and minerals (phosphorus, magnesium) are also lost, but the indicators of other components can either increase or decrease.

Medicinal properties

Eggplant fruits show numerous medicinal properties. So, due to the abundance of indigestible fiber, which acts like a piston in the digestive system, cholesterol is effectively excreted from the body (it decreases in the blood by up to 40%, depending on the mode of use of the product). This, in turn, prevents the formation of new cholesterol plaques on the walls of blood vessels, thereby inhibiting the development of atherosclerosis and reducing the risk of coronary heart disease.

In addition, eating eggplant can:

- prevent the formation of stones in the gallbladder;
- alleviate the condition of patients with type 2 diabetes;
- relieve swelling and remove uric acid salts, which is especially important for those suffering from gout;
- stimulate the work of the gastrointestinal tract, relieving chronic constipation;
- restore salt and acid-base balance;
- stabilize hemoglobin in anemia.

The presence of vitamin PP (no acid) in eggplants can make it easier for smokers to quit the bad habit.

Recent breeding work has made it possible to develop almost black eggplant hybrids with a very high content of anthocyanins, capable of restoring body cells and preventing their damage.

Use in medicine

In the composition of medical preparations, at the moment, the most significant role is played by the compound *Solasodine obtained from eggplant. Rhamnosyl Glycosides*, It is included in Curaderm cream, which is prescribed as an adjuvant in the treatment of non- melanoma skin cancer. Medical journals describe the successful use of the cream in the treatment of basalioma (basal cell skin cancer) in the head and neck.

Although the beneficial properties of eggplant are still being studied in scientific official medicine, the pharmacological capabilities of a number of elements that make up the vegetable in large quantities are already known. Thanks to them, the following areas of medical development can be considered the most promising.

- **The use of chlorogenic acid.** Eggplant contains various polyphenols, but chlorogenic acid in its antioxidant activity is 27 times ahead of the flavonoid naringenin. This acid has a beneficial effect on the cardiovascular system by reducing the sensitivity to low-density lipoprotein oxidation. It is able to prevent the development of diabetes, tuberculosis and even oncological diseases, showing an antitumor effect. In addition, it is able to protect liver cells, is active in resisting strains of staphylococcus and Escherichia coli. Some forms of acid are active against herpes pathogens.
- The use of potassium salts. Salts help to remove fluid from the body, creating a mild diuretic effect, prevent the development of coronary disease and improve the functioning of the entire cardiovascular system.

In folk medicine

Traditional medicine has learned to use the healing properties of eggplant faster than the official one. Various parts of the fetus are used (together or separately).

- **Pulp.** It is used in various versions for atherosclerosis (as a means of cleansing blood vessels from cholesterol deposits), for edema caused by disorders in the work of the heart, and also as a prevention of gout as an effective way to remove uric acid. Folk therapy widely uses eggplant to stimulate metabolic processes, bile secretion and peristalsis (wave-like contraction of the intestinal walls to move the contents of the cavum to the outlet).
- **Peel.** Dried and powdered eggplant peel is prescribed for diseases of the oral cavity (as a basis for rinsing) and with increased pressure. It is only necessary to take into account that in the classic bitter varieties of these vegetables, the greatest amount of poisonous solanine is concentrated in the peel, so you should be careful about self-medication in this way.
- **Juice.** In folk medicine, freshly squeezed eggplant juice is actively used, which, due to its antiseptic and antibacterial properties, fights eczema, external ulcers and skin lesions. They also treat wounds to prevent the spread of infection.

Usually eggplant juice is extracted by first rubbing the vegetable on a grater, and then passing the resulting slurry through a press (or simply squeezing the juice by hand). At the same time, to reduce the intensity of oxidative processes, if possible, plastic rather than metal graters are used. If there are none, you can finely chop the pulp with a ceramic knife, and then squeeze the juice out of this puree.

To normalize the work of the heart and improve the condition of blood vessels (by removing cholesterol formations), drink raw eggplant juice 1-2 teaspoons during meals for 10 days.

infusions

The choleretic infusion of eggplant by traditional healers is prepared as follows:

- A medium-sized vegetable is peeled.
- The pulp is cut into small cubes (about 2x2x2 cm or smaller) and poured with a glass of boiling water.
- Already scalded eggplant is aged for about half an hour in a water bath.
- The resulting mixture is filtered through gauze.

This infusion is taken 100 ml three times a day before meals.

An antiseptic mouthwash is prepared from the peel of a vegetable:

- The peel of the fruit is thinly cut and spread on a paper towel to remove moisture.
- The dried skin is ground into powder.
- The resulting powder is poured with boiling water and allowed to brew until cool.

Strained liquid is used to rinse the mouth when inflammation and sores appear.

in oriental medicine

In oriental medicine, the attitude towards eggplant is ambiguous. Tibetologist _ Chzhoma Dongzhi , in his book Improper Diet, states that excessive consumption of eggplant by people with poor health threatens the development of cancer. He also warns patients with tuberculosis against including eggplant in the diet, since this can provoke a hypersensitivity reaction against the background of drugs for tuberculosis.

According to the author, dishes with eggplant and crab will negatively affect the activity of the intestines and stomach. Those suffering from chronic diarrhea and other digestive problems should not eat them at all, and people with skin diseases should reduce their consumption of this vegetable.

At the same time, it is known that in traditional Tibetan medicine, recommendations for the use of certain products depend on the constitutional type of a person (there are seven such types in total). And if people of one type are really not advised to eat eggplant, then this vegetable can benefit people of another type. So, for example, for the type of " lung- trip" with a predominance of two life principles "wind-bile", a reduction in the diet of a number of products, including eggplant, is really required. And for the type " lung " with a predominance of the vital principle "wind", this vegetable is quite acceptable.

In general, Tibetan medicine uses eggplant for diseases of the Blood and Heat, including intestinal bleeding, ulcerative colitis, urinary retention. Eggplant is used in the treatment of skin itching, to heal microdamages in the mammary glands, and even to lower blood pressure.

In Chinese traditional medicine, which classifies foods according to the presence of Yin and Yang beginnings on a scale from "-3" to "+3", respectively, eggplant occupies the extreme position with a value of "-3", corresponding to the maximum concentration of the "Yin" beginning. Given that balanced foods are considered to be those that are close to neutral zero, eggplant should be used with great care and only with a particularly weak beginning of "Yin".

In therapy, eggplant, according to Chinese medical practice, is able to drown out the heat of the bladder, as well as regulate the fullness of the pericardium (Yang Fire). In the Eastern tradition, the pericardium includes the adrenal glands, which, by controlling metabolic processes, the circulatory system and water and electrolyte balance, are responsible for the balance of physical (sexual) and spiritual (sensual) satisfaction.

There are also known curious cases that occur in the absence of a critical eye in the application of some recipes of oriental medicine. So, recently in the news feed there was (confirmed by numerous photographs) a message about a Chinese man who, on the advice of a local healer, used an ancient eggplant therapy to cure constipation and abdominal pain. The patient thrust a whole 30 cm long vegetable into himself through the rectum, and he did it with such persistence that he damaged one lung. Eggplant after such treatment had to be removed surgically.

In scientific research

In recent years, the healing potential of eggplant has interested scientists around the world:

- Chinese researchers have extracted anthocyanins and some other derivatives from local vegetable varieties to evaluate their effect on human colon cells. As a result of comparing various anthocyanins, scientists came to the conclusion that all of them, to a greater or lesser extent, protect DNA from damage and have a pronounced antioxidant activity ^[4].
- Brazilian scientists experimentally tested the effect of eggplant juice on lipid levels and their state in plasma, as well as on the ability of the juice to remove "bad cholesterol". In the described experiment, rabbits with artificially high cholesterol levels were given 10 ml of eggplant juice daily for 14 days. The researchers concluded that in experimental rabbits after such a diet, weight was qualitatively reduced, and cholesterol levels in plasma and aorta fell, and triglycerides, a high level of which increases the risk of developing cardiovascular diseases, also significantly decreased ^[5].
- American experts from the Center for Cardiovascular Research at the University of Connecticut were also interested in the ability of eggplant to eliminate dysfunction of the heart muscle and its lesions. Moreover, scientists compared the effectiveness of raw and grilled eggplant, introducing prepared vegetable-based products into the diet of laboratory animals for 30 days. Grilled fruits were tested on a par with raw ones to understand how seriously the chemical composition changes in terms of the effect of such an eggplant on heart function.

Studies using an isolated perfusion heart model have shown that, regardless of the preparation method, eggplant retains potent cardioprotective compounds that have a pronounced protective ability. The concentration of some components (for example, antioxidant vitamins A, C, β -carotene) decreased after grilling, while others (for example, the antioxidant compound nasunin) increased. However, this did not create qualitative differences in the protective effect - in any form, eggplants turned out to be good for the heart. ^[6].

- The Food Biotechnology Laboratory of the University of Massachusetts investigated the ability of eggplant phenolic compounds to improve the condition of patients with hypertension and type 2 diabetes. Based on test-tube experiments, researchers have recommended an eggplant diet as a treatment for type 2 diabetes, finding that phenol-enriched eggplant extracts with moderate antioxidant activity are able to inhibit and block alpha-glucosides, reduce associated high blood pressure, and as a result , improve the condition of patients ^[7].
- Australian scientists in 2011 presented extensive clinical trials of a then-new class of anticancer drugs based on eggplant-derived compounds (Solasodine Rhamnosyl Glycosides SRG; they are BEC drugs). The agents used have shown high efficacy in intravenous and intraperitoneal administration, as well as when applied topically as part of a cream (Curaderm) in the treatment of non- melanoma skin cancer. The cream has been shown to be more effective than a number of other anti-cancer drugs, with impressive cosmetic results^[8].

Weight regulation

A special role in the processes of losing weight with the help of eggplant is played by chlorogenic acid, which is found in even greater quantities in the peel of green coffee beans. The mechanism of action of chlorogenic acid, due to which subcutaneous fat is primarily consumed during physical exertion, is described as follows.

Once in the body, the substance binds glycogen (polysaccharide), which is formed by glucose residues and is considered its main form of storage. With an increase in physical activity, free glycogen begins to be consumed from reserves, providing the body with energy. But if the polysaccharide is retained by acid, then in the same situation the body is forced to turn to other sources of energy - to subcutaneous fat deposits.

The effectiveness of weight loss with the participation of chlorogenic acid is estimated at about 10%. At the same time, no extensive independent studies were conducted to test the operation of the described mechanism, and the sponsors of those experiments that are sometimes referred to on the Web are green coffee sellers who are materially interested in the results obtained. Thus, only new studies will be able to add up a complete picture of the dietary impact of acid on the body.

Fortunately, in the matter of weight loss, eggplant has another, already undeniable, advantage - in its raw form it contains very few calories (only 24-25 kcal / 100g), and although the baked version has twice as many calories, it's still comparatively few. Unfortunately, eggplant fried in oil increases the calorie content tenfold, ceasing to be a dietary product. To remove excess oil, fried vegetables are placed on a paper towel or steamed for 10-15 minutes, but the calorie content of such a dish is still high.

In cooking

On the European continent, people were able to recognize the culinary virtues of eggplant rather late only in the 19th century, but since then, for two hundred years, various national cuisines have managed to include this vegetable in traditional dishes. The reason for this is the good compatibility of eggplant with cereals, meat, and other vegetables. Moreover, the vegetable does not just bring its taste to the dishes. It gives them volume and is involved in creating a shape, while maintaining a delicate texture, which other vegetables cannot.

Different peoples of the world have their own unique eggplant dishes:

• Hit of the Caucasian summer - ajapsandal .

It is based on eggplant, sweet and hot peppers, tomatoes, onions, garlic, herbs (dill, basil, cilantro, parsley) with the possible addition of potatoes. According to the recipe, fried onions, peeled tomatoes, peppers, garlic, herbs are gradually added to the pan. The dish is stewed for about 10 minutes, after which the stew is mixed with eggplant fried in sunflower oil and kept in the refrigerator for several hours . not to be at all, but in ajapsandal it is the basic ingredient. It is significant that eggplant is also often found in modern versions of ratatouille .

• Oriental appetizer baba ganush (or baba ganuj). Some call baba ganoush porridge, others call it pate, and still others call it sauce. But this appetizer fell in love with a lot of people, and in Israel (where the dish is more often called "hatsilim salad") not a single large and festive feast can do without it. To prepare baba ganush , the whole eggplant is placed on fire (usually on the grill, but you can even on the fire of a home gas stove or in the oven), so that the flame chars the peel on the outside. Then the fruit is cut lengthwise, and the tender flesh is scraped out so that the burnt peel does not get into the dish, but all the most delicious after such an extreme fire treatment is preserved. Next, the pulp is crushed into a homogeneous mass, spices, oil and, as a rule, sesame paste are added.

• Turkish "boats", or Imam Bayaldy.

From the Turkic language, the name of the dish is translated as "The Imam lost consciousness (fainted)". One of several popular versions attributes this to the excellent taste of stuffed eggplant. To prepare the "boats", a deep longitudinal incision is made in the eggplant and through it all the seeds and 2/3 of the pulp are first selected, and then prepared rice, thick tomato filling, vegetables (onion, garlic, sweet pepper, dried or fresh tomato) are placed in it.), spices (nutmeg, coriander, lemon juice, sugar, salt, pepper), herbs. The set of products and the form of Imam Bayalda in different cooking options may differ. In the same Turkey, it is sometimes served, for example, in the form of a casserole (and in general, only in Turkey there are about 600 recipes with the inclusion of this vegetable). But the essence of Imam Bayalda remains the same - eggplant absorbs the aromas and juices of all other ingredients, adding its own taste to them.

In addition to those listed above, there are other famous eggplant dishes in the world: Sicilian caponata , Moroccan zaaluk , Greek moussaka, etc.

Thanks to the writer Valentin Kataev, one Odessa tradition has become widely known - cutting eggplant with a wooden knife. Arriving from Odessa to Moscow, Kataev tried to cook homemade eggplant caviar "in Odessa style", but he failed to do this without a wooden knife, which was supposed to chop the baked pulp of the fruit.

It makes sense to use a wooden or ceramic (but not metal) knife when slicing eggplant. The antioxidants (polyphenols) contained in the vegetable, thanks to iron ions, are oxidized more easily and faster than simply by contact with oxygen. Therefore, if you cut the pulp with an iron knife or pass it through the metal screw of the meat grinder, it will darken (oxidize) more. The reaction rate is also affected by high-temperature exposure, which disrupts the structure of enzymes, which means that when whole eggplant is baked and then cut, it will darken less than if it is first cut and then baked.

In cosmetology
The cosmetological advantages of eggplant were appreciated both by manufacturers of mass cosmetics and appreciated by home care for the skin of the face and hands. South Korean companies especially liked eggplant extract, some of which promise that this ingredient in the mask will help rid the skin of keratinized plates, smooth the epidermis and narrow pores, others that it will even out skin tone and brighten it, and still others that it will prevent aging cells and activates self-protection mechanisms.

Approximately the same is expected from the eggplant and manufacturers of home cosmetics, hoping that the mask prepared from it:

- lightens age spots;
- smooth wrinkles and restore tone;
- moisturize the skin;
- cure acne breakouts.

Here are the recipes for several popular cosmetic formulations:

- **Mask for problem skin.** 10 g of grated eggplant are mixed with the same amount of clay and 15 drops of linseed oil. The composition is applied to the face in a dense layer for 15-20 minutes. This procedure eliminates sebaceous blockages of the mouth of the hair follicle, narrows the pores and stimulates microcirculation in the vessels.
- Mask for age spots and freckles. 15 ml of eggplant juice squeezed using a press are mixed with grapefruit juice (in a ratio of 3/1), 10 g of oatmeal powder (flour), and a gram pinch of ginger. The composition is placed on pre-cleansed skin for 15 minutes, after which it is removed with damp cotton or sponge.
- **Toning mask.** 15 ml of squeezed eggplant juice are mixed with 10 g of honey and one tablet of ascorbic acid crushed into powder. As in previous procedures, the composition is applied to cleansed skin for about a quarter of an hour.

From the above examples, it can be seen that although eggplant is considered the main component in recipes, auxiliary components give the target orientation in the use of a cosmetic product. To cleanse the skin, add sea salt (5 g) and activated charcoal (tablet) to eggplant juice, soda (5 g) and lemon juice (5 ml) for bleaching, cottage cheese (10 g) and cream (15 ml) for moisturizing .

Dangerous properties of eggplant and contraindications

Like other nightshades (potatoes, tomatoes, etc.), eggplant, among other organic compounds, contains solanine, a poisonous glycoside (alkaloid), which is produced by various parts of the plant for protective purposes, acting as a fungicide and insecticide. The Latin name for eggplant is Solanum . melongena - indirectly indicates a significant amount of poisonous alkaloid in this vegetable crop, which gives it a bitter taste. However, unlike, for example, tomatoes, in which the poisonous compound accumulates in green, unripe fruits, solanine in eggplant reaches its maximum concentration when ripe. Moreover, berries of dark varieties are collected mainly in the skin.

Solanine is toxic even in small doses. First, it causes some excitation of the nervous system, after which it is oppressed. In parallel, the decomposition of erythrocytes occurs. Poisoning manifests itself in the form of nausea, abdominal pain, diarrhea and vomiting. Headaches, disorientation in space may occur. Patients have dilated pupils. In severe cases, it can lead to convulsions and coma.

Of course, for serious eggplant poisoning, you need to eat a lot of overripe raw fruits of dark varieties. However, in order not to experiment on yourself, you can simply take a number of preventive measures:

- Harvest fruits in the "technical maturity" stage, without waiting for them to accumulate a poisonous compound.
- Get rid of especially toxic skins in old dark varieties.
- Buy modern hybrids, riddled by breeders from high concentrations of solanine, and, therefore, from the characteristic bitterness.
- Carry out pre-treatment of the pulp (for example, soaking in brackish water).
- Thermally process the product, which will largely remove the alkaloid from it (although it will also "save" the dish from some useful substances).

The most progressive way is scientific. Breeders, breeding new modern hybrids, rid eggplant of conditionally poisonous solanine, so that fruits with light flesh can be eaten even without soaking and raw.

However, in addition to solanine, eggplant also contains oxalic acid, which contributes to the formation of oxalate kidney stones, which is dangerous for people with urolithiasis. This is considered the most serious contraindication.

In addition, the consumption of eggplant should be limited to people with gastrointestinal problems (gastritis, ulcers, disorders), as well as insulin-dependent patients in whom eggplant in the diet can cause a pathological decrease in glucose concentration.

Selection and storage

The choice of quality eggplants is carried out, focusing on external signs. The fruit should have a smooth skin without cuts, dents, mold marks and dark rotten spots. At the same time, the list of buyer's tasks includes the acquisition of not only intact, but also slightly unripe fruits (which are at the stage of technical maturity). To do this, assess the condition of the stalk, which in overripe vegetables will look stale and brown. The young fruit should feel firm to the touch. If the seller shows his product "in a section", then you can also estimate the number of seeds (old eggplants have a lot of them).

To assess the concentration of solanine in a variety, they are usually guided by the color of the pulp. The greener it is, the more poisonous compound in the variety and, accordingly, bitterness, and the lighter (whiter) - the less. Without breaking the fruit, the color of the pulp inside can be determined by the color of the speck on the "crown" of the eggplant. "White spot" indicates that the flesh inside the eggplant is the same.

Eggplants are stored at room temperature for about 2-3 days. But for longer storage, you need to move them to the refrigerator. Eggplant can lie in the vegetable compartment for about 3-4 weeks. And with deep freezing - at least six months. Solanine-containing varieties are sometimes peeled and kept in salt water for several hours before being placed in the refrigerator.

Varieties and cultivation

Gardeners in our country have recently increasingly paid attention to exotic varieties of this vegetable crop. The oblong purple eggplant fruit we are used to is just one of the options in an extremely wide varietal variety. Thanks to breeding work, the fruits of different eggplant varieties differ from each other in many ways:

- **in size:** there are both tiny 30-gram berries and 2-kilogram giants;
- **by color:** eggplants are white, yellow, pink, red, green, black, striped;
- **in shape:** some resemble chicken eggs, others are balls and balls, and still others are more like pears.

In the review below, we have collected the top 5 multi-colored varieties, demonstrating how the fruits of the same plant species can differ from each other.

- "White Egg". In addition to the fact that the fruits of this hybrid look like a chicken egg, they have a pronounced mushroom (champignon) taste with no bitterness, which is characteristic of many purple berries. Sometimes the tender flesh of white varieties is also compared with chicken meat. The most famous include "Iceberg", "Swan", " Pin-Pong ", Bibo , "Pelican", with a recognizable saber-shaped fruit, etc.
- "Thai green". It represents a group of green eggplants, but even in this group, the hybrid stands out for its exotic shape (curved cylindrical fruits vaguely resemble unripe bananas) and surprisingly tender, sweet and fragrant pulp, which is appreciated by culinary experts all over the world. The "Yoga" light green hybrid looks like "Thai Green", but in taste it is inferior to its Thai "relative". Other varieties of green eggplants can be tear-shaped (as, for example, "Alenka"), and spherical ("Green Galaxy F1", "Green"), and flattened cylindrical ("Green F1").
- "Golden Boy". The fruits of the hybrid have a bright yellow color, and although they can be eaten when harvested during the period of technical maturity, yellow eggplant is more often grown as an ornamental plant. In particular, the height of the "Golden Boy" rarely exceeds half a meter, which makes it an excellent "windowsill culture".
- "Red Ruffled ". Despite the "talking" name, this decorative hybrid, like the previous one, belongs to the group of yellow eggplants. Its reddish-orange skin acquires its characteristic color at the stage of incomplete ripening, when the fruit should be harvested. Ripe eggplants are bitter and contain many hard seeds. Due to its color, rounded shape with flattened "poles", ribbed fruit and size (3-4 cm in diameter), Red Ruffled looks like a tomato.
- "Matrosik". The name of the eggplant directly indicates its striping the pink-lilac uneven color is located on the white background of the fruit. Despite this coloring, there is no bitter and poisonous solanine in this variety, thanks to which the Matrosik eggplant can be used raw in salads, and when cooking, you can not remove its thin skin.

Eggplant is a capricious crop to grow. She is thermophilic, photophilous, sensitive to transplantation and sudden temperature changes. Even at low positive temperatures, holding long enough, the plant dies. With the development of new hybrids, breeders have achieved greater resistance to temperature extremes, which greatly simplified the task of gardeners, farmers and gardeners.

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Eggplant - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of eggplant 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 eggplant in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of eggplant on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application.



Watermelon (lat. Citrúllus lanatus)

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Abstract. The article discusses the main properties of watermelon 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 watermelon is considered in various types of medicine and the effectiveness of its use in various diseases. Potentially adverse effects of watermelon analyzed separately on the human body under certain medical conditions and diseases. The scientific foundations of diets with its use are considered.

Keywords: watermelon, benefit, harm, beneficial properties, contraindications

Beneficial features

Main			
substances (g/100 g):	Fresh watermelon [1]	Dried watermelon seeds [2]	
Water	91.45	5,05	
Carbohydrates	7.55	15.31	
Sugar	6.2		
Squirrels	0.61	28.33	
Alimentary fiber	0.4		
Fats	0.15	47.37	
Calories (kcal)	thirty	557	
Minerals (mg/100 g):			
Potassium	112	648	
Phosphorus	eleven	755	
Magnesium	ten	515	
Calcium	7	54	
Sodium	one	99	
Iron	0.24	7.28	
Zinc	0.10	10.24	
Vitamins (mg/100 g):			
Vitamin C	8.1	0.0	
Vitamin PP	0.178	3,550	
Vitamin A	0.17 1	0.0	
Vitamin B6	0.045	0.089	
Vitamin B1	0.033	0.190	
Vitamin B2	0.021	0.145	
Vitamin E	0.05	0.0	

As can be seen from the table, watermelon is a low-calorie berry, consisting mainly of water. However, you should not abuse it and try to lose weight with it, because it contains a large amount of carbohydrates and sugars and has a very high glycemic index. Nevertheless, it is also impossible to underestimate the benefits of watermelon for the body, because it contains useful trace elements and vitamins. And its seeds, although they have an excessively high energy value, are the richest source of phosphorus, magnesium, zinc and vitamin PP.

Medicinal properties

At first glance, it may seem that watermelon, which is 90% liquid, does not particularly enrich the body with useful elements, but in fact, together with it, a person receives a significant dose of vitamin C, which protects cells from damage and gives skin and blood vessels elasticity, as well as vitamin A, which is directly involved in the process of visual perception. Despite the fact that the pulp of watermelon does not have a high content of B vitamins, including the extremely important folic acid,

as well as vitamin PP, which regulates the release of energy from food, they are present in abundance in watermelon seeds.

As for minerals, watermelon provides the body with a large amount of magnesium, which has a beneficial effect on muscle contractility. In addition, it is essential for the normal absorption of calcium. Without magnesium, the process of bone tissue renewal is impossible. Especially a lot of this trace element in the seeds of watermelon (130% of the daily requirement in 100 g). Also, watermelon (to a lesser extent the pulp and to a greater extent the seeds) are rich in phosphorus, which gives strength to bones and teeth. By the way, contrary to popular myth, eating seeds does not lead to appendicitis.

American scientists have proven that watermelon is the richest natural source of L - citrulline , an amino acid from which nitric oxide is synthesized in the body, which, in turn, promotes vasodilation and maintains their tone. In one experiment, subjects after drinking citrulline was transferred to a room with a low temperature in order to provoke vasoconstriction. Then they measured the pressure, and it turned out that after the amino acid entered the body, the indicators were lower and the vessels narrowed less. Moreover, L - citrulline is able to remove lactic acid from the muscles ^[3].

The red color of watermelon pulp is largely due to the presence of carotenoids in its composition , which are converted into vitamin A in the body. However, one of them, lycopene , does not undergo this transformation. Instead, it exhibits high antioxidant activity. Some scientists attribute its effect to a reduced risk of developing cancers of the digestive system and prostate. In addition, its beneficial effect on blood vessels (lowers cholesterol and prevents the formation of plaques) and the functioning of the heart are noted. Like other carotenoids , lycopene is good for vision and contributes to the prevention of age -related macular degeneration (impaired central vision).

Watermelon is considered a functional food and is very beneficial for people who get a lot of exercise in their workouts. This berry simultaneously provides the body with fast carbohydrates, antioxidants, amino acids. Studies show that watermelon puree and juice (500 ml after training) affect the body in the same way as sports drinks. They reduce muscle soreness and aid recovery ^[18].

Finally, it should be noted that, contrary to popular belief, watermelon cannot be considered a magical remedy that flushes and cleanses the body of all toxins. Together with the pulp, we consume not only a large amount of liquid, but also an excess amount of sugar. To remove it, the kidneys are actively involved in the work, and the more sugar they need to remove, the more fluid they draw from the body. Thus, small portions can, in a good way, activate the work of these organs, but you do not need to lean on watermelons and create a heavy load on them.

In medicine

In scientific medicine, watermelon is still practically not used. But given that some of its components have a high therapeutic potential, it is possible that in the future scientists will use them to develop various medicines (for example, vasodilators).

To date, watermelon juice extract is used in a Korean remedy called "*Mighty Khan*" or "*Super Khan*". Its action is aimed at enhancing potency, and watermelon juice is responsible for cleansing and expanding the vessels through which blood flows to the penis. True, let us pay attention to the fact that this remedy is not classified as a drug, but as a food supplement. Yes, and it is quite difficult to draw an unambiguous conclusion about its effectiveness. The degree of exposure depends on the causes of erectile dysfunction, so it is better to consult a doctor about the advisability of taking these capsules.

Also on the shelves of pharmacies, watermelon is presented in the form of an oil extract of its seeds, which is recommended for use in kidney diseases. This tool helps to remove sand and small stones. It improves the structure of the kidney tissue. In addition, the oil produces a slight diuretic effect, enhances the excretion of uric acid and is involved in maintaining the acid-base balance.

In folk medicine

In folk medicine, watermelon is used mainly in the treatment of diseases of the kidneys and urinary tract, but some recipes promise a solution to problems with the cardiovascular and digestive systems. Watermelon is also used externally to accelerate the healing of wounds and burns. Note that in the preparation of folk remedies, the peels and seeds of the watermelon fruit are used more often than the pulp.

Decoctions

A decoction of watermelon peels is advised to use when sand or small stones appear in the kidneys and gallbladder, as well as for colitis and dysbacteriosis. This remedy can be prepared both from fresh peel and from dried. If we are talking about fresh raw materials, then the first thing to do is to separate the crust from the pulp and clean it from the outer bright green film. Then grind and pour water at the rate of 100 g of raw materials per 1 liter of water. This mixture should be left on low heat for 30 minutes, then let it brew for about an hour and strain.

If there is a need to prepare such a decoction throughout the year, then you can make stocks for the winter. Peeled and cut into small pieces of crust should be laid out in one layer on a baking sheet and put in an oven preheated to 50 $^{\circ}$ C. When the moisture evaporates, the temperature is raised to 70 $^{\circ}$ C. You can also leave the baking sheet in the sun or use an electric dryer. The resulting raw materials are usually stored in paper bags or ground into powder and transferred to glassware.

To prepare a decoction of 150 g of dry peel, pour 1 liter of boiling water (when using powder, take 1 tablespoon per 1.5 cups of water) and let it brew for an hour. Take this remedy one glass 3-4 times a day 20-30 minutes before meals. By the way, with diarrhea, healers advise taking one teaspoon of the powder with water every two hours until digestion improves.

There are also recipes for decoctions from the seeds of a watermelon fruit. To prepare such a drug, 40 g of seeds are kneaded in a mortar and pour 1 liter of hot water, leaving it on low heat for 30 minutes. Then you need to let the liquid brew for about an hour and strain. Next, add 150 g of mashed watermelon pulp, mix and send for storage in the refrigerator. Use this remedy for inflammation of the urinary tract and kidney disease 2 days a week according to the following scheme: 1 glass on an empty stomach, and then another glass 30 minutes after each meal.

Outdoor use

Traditional healers claim that both watermelon pulp and watermelon rinds are effective in treating minor wounds and sunburn. To do this, it is necessary to grind fresh raw materials with a blender to a puree mass, and then apply to the affected area of the skin and fix with a bandage. Wash off with cool water after an hour. To speed up the healing of wounds, you can make a compress from a decoction of watermelon peels.

In addition, traditional healers claim that applying fresh crusts to the temples for headaches and to the joints for arthrosis helps to reduce pain. However, the usefulness of such procedures is highly questionable.

Juice

In folk medicine, watermelon juice is considered an effective remedy for fever, hematological diseases and infectious inflammation of the genitourinary system. Usually it is taken one glass 4-5 times a day. In addition, watermelon fruit juice is often mixed with freshly squeezed juices from other vegetables and fruits. Among the most popular mixtures are the following:

- Watermelon- orange (mix in equal proportions and take 0.5 cup 3 times a day 30 minutes before meals). Reduces cholesterol levels, activates intestinal motility, helps with mild constipation, relieves symptoms of overwork.
- Watermelon- birch (mix in equal proportions and take 1 glass 3 times a day 30 minutes before meals). Reduces blood pressure, helps to relieve symptoms of arrhythmias, has choleretic, diuretic and antipyretic effects. She is recommended to rinse the mouth and throat with inflammatory processes.
- Watermelon- cherry (mix in equal proportions and take 1 glass 3-4 times a day). It helps with colds, has an anticonvulsant effect, normalizes the functioning of the gastrointestinal tract and improves appetite.
- Watermelon- apple (mix in equal proportions and drink throughout the day). It helps to restore or maintain the tone of the body, helps with mental and physical overwork, dizziness. It has a mild laxative effect.
- Watermelon- potato (mix in a ratio of 2 to 1 and take 1 glass 2 times a day). A mixture of these juices is useful for problems with the digestive system (gastritis with high acidity, enterocolitis, peptic ulcer of the intestine and stomach, dysbacteriosis, heartburn, constipation). It is also used as a lotion for sunburn.

By the way, with inflammation of the urinary tract and fevers, it is recommended to use "watermelon milk". To prepare it, 50 g of seeds are thoroughly kneaded in a mortar, and then 500 ml of water are added and continue to be crushed until a milky liquid appears. The resulting mixture is filtered and drunk 1 teaspoon 6 times a day.

in oriental medicine

In the folk medicine of the eastern countries, watermelon has long been given close attention. For example, in China, it was classified as a cooling food and believed to have an effect on the heart, stomach, and bladder. It was believed that it produces a cleansing effect and is able to remove diseases from the body if it is regularly taken before meals. In addition, this berry calms the spirit and helps to get rid of anxiety and frustration ^[16].

Until now, Chinese traditional healers use watermelon to relieve diseases such as nephritis and hypertension ^[15]. Moreover, they believe that it has an antipyretic, diuretic and mild laxative effect. Special attention is paid to the seeds, which, when dried, are brewed like tea. Such a drink has a beneficial effect on the kidneys and helps to reduce pressure. **However, Chinese healers warn against eating watermelons those who have acute problems with the gastrointestinal tract.**

In Indian folk medicine, watermelon is considered primarily a cold and moist product that stimulates the appetite and improves the digestion process. In addition, it is recommended to use it for eye diseases, as well as use it externally for skin inflammations.

In scientific research

Watermelon gets into scientific research mainly due to the fact that it contains a high concentration of the carotenoid pigment lycopene . It was previously believed that the richest source of this antioxidant

is tomato. However, later scientists found that watermelon with red pulp is not only not inferior, but even surpasses the tomato in this indicator by about 40% ^[4]. Moreover, in order to obtain a high dose of lycopene from a tomato, it must first be subjected to heat treatment, and from a watermelon, lycopene is absorbed by the body in full and directly ^[5].

Researchers believe that this pigment has the necessary properties to prevent chronic diseases such as dyslipidemia (abnormal cholesterol levels), diabetes, osteoporosis and even cancer. In addition, it contributes to the fight against free radicals, oxidative stress (the process that leads to diseases of the cardiovascular and nervous systems) and neurodegenerative diseases ^[6].

For example, in one experiment, scientists introduced lycopene into the diet of healthy male smokers with a low intake of fruits and vegetables and found that the levels of oxidative stress in their bodies were significantly reduced. Moreover, improvements in the functioning of the endothelium (the innermost layer of blood vessels) have been documented ^[7].

According to the results of one study conducted at Harvard University, scientists found that men who regularly receive lycopene are less at risk of developing cancer, especially prostate cancer^[8]. There is also evidence that among those who did develop the disease, there were 25% more people with a lack of this carotenoid pigment in the diet^[9].

As for women, scientists believe that a sufficient amount of lycopene in the body helps to reduce the risk of developing cervical cancer by 5 times ^[10]. And if we take statistics that include other types of cancer, then among patients there were 44% more people who received an insufficient amount of carotenoid pigment ^[9].

Lycopene has also proven effective in hyperglycemia. Chinese scientists divided rats into groups, each of which was given this pigment at various doses (0, 250, 500 and 2000 mg/kg of body weight) for 28 days. At the end of the experiment, no abnormalities were found in the readings of blood and urine, except that the glucose level decreased markedly. Moreover, the higher the dose of lycopene, the more glucose fell ^[11]. In another similar study, not only a decrease in sugar was recorded, but also an increase in insulin levels ^[12].

In addition, from 1992 to 2003 large-scale work was carried out to monitor diabetic women of the middle age category. During this period, they followed a diet that was high in lycopene -containing foods. Scientists continued to monitor the condition of these women until 2013 and, as a result, concluded that, on average, their insulin levels increased by 37-45% ^[13].

Finally, in one of the most recent studies, scientists analyzed the effects, not only of lycopene, but of all the components of watermelon, on the body of rats that were kept on an atherogenic diet (which contributes to the development of atherosclerosis). In particular, special attention was paid to the antioxidant and anti-inflammatory properties of watermelon, as well as its effect on the lipid profile.

It turned out that in comparison with the control group, in rats that regularly received watermelon extract, the level of oxidative stress, cholesterol and triglycerides decreased, and the antioxidant capacity of the body increased, which, in turn, causes a decrease in the risk of developing cardiovascular diseases.^[14].

Weight regulation

Usually, watermelon is added to the top of fruits and vegetables, which help to lose weight quickly. Often, a mono-diet is even based on it. On the one hand, such an attitude towards this giant berry seems justified, because it contains a lot of liquid and very few calories (100 g of pulp contains only 30 kcal). However, on the other hand, watermelon has a too high glycemic index, it is high in sugar and in large quantities it puts a huge burden on the kidneys.

So, the use of watermelon in diets for weight loss is possible, but its portions should not exceed 200-300 g per day. Despite the fact that this berry has fiber, which should provide a long-lasting feeling of satiety, after a watermelon, the appetite returns quite quickly. The thing is that its glycemic index is 80 units. This means that after eating the pulp in the blood, the level of sugar rises sharply, and then the level of sugar falls just as sharply, and the feeling of hunger quickly resumes. In addition, although the sugars in watermelon are simple, their excess does not bring benefits to the body.

If in diets with a varied diet, watermelon in moderation is quite acceptable and even useful because of its low calorie content and ability to remove excess fluid from the body, then it is better to refuse a watermelon mono-diet. Eating the same product, the body loses a huge amount of nutrients. In addition, along the way, watermelon washes out useful minerals that were already in the body.

Finally, a huge burden falls on the kidneys, so such a diet is not only undesirable, but contraindicated for people who already have problems with these organs or who suffer from inflammation of the genitourinary system. Dangerous consequences can also await those who have diseases of the cardiovascular and digestive systems or diabetes.

In cooking

The traditional way to consume watermelon is fresh and often separate from other foods. However, everything is not limited to this, in many cuisines of the world, watermelon is dried, salted, fried. It is used to make jam, honey (traditional Astrakhan nardek), it is added to desserts, oysters, salads and even soups (for example, one of the options for summer gazpacho). In addition, the inhabitants of the Mediterranean prefer to spread cream cheese on watermelon, and the Thais have a habit of sprinkling salt on the pulp. By the way, in China, watermelon with salt is also quite common, so they even released the popular Fanta drink with the appropriate flavor.

According to its taste qualities, watermelon goes well with both sweet and salty foods. However, it is worth paying attention to the fact that salt retains water, and watermelon just supplies it to the body in large quantities. This combination can lead to fluid retention and swelling. It is useful to combine this berry with fat-containing foods, because lycopene and carotenoids are fat-soluble pigments. In this sense, a salad of watermelon, feta cheese and mint, seasoned with olive oil, is well suited.

If you want to experiment and bring a little exotic to your daily diet, then you can try frying watermelon slices. First of all, they need to be peeled and seeds, and then cut into small pieces. For batter, mix 2 egg whites and 4 tablespoons of potato starch (previously diluted in a small amount of water). Dip slices of watermelon in flour, then in batter and fry in deep fat or in a pan. After that, sprinkle with powdered sugar.

Another interesting summer dessert is watermelon cake. To prepare it, peel the watermelon from the peel and use a knife to give it any shape (it will serve as the basis for the dessert). Then grind the pieces of coconut to a puree state, heat this mass and add gelatin to it, stirring until completely dissolved, pour in cold whipped cream and put it in the refrigerator for an hour. Then coat the watermelon pulp with this cream and sprinkle with almond flakes.

By the way, not only the pulp can come in handy in cooking, but also the peel, from which jam is made. The recipe is extremely simple, but it will take time. Washed and cut into small pieces of peel put in sugar syrup and boil for 15 minutes, then left in the refrigerator for 12 hours. During this time, the skins become translucent and acquire an amber hue. After that, they must again be put on fire and

boiled for 15 minutes, and then hidden in the refrigerator for 12 hours. For the third time, while boiling in the jam, you need to add orange zest and spices to taste.

Finally, watermelon makes for some very spectacular summer cocktails. To prepare such a "drink in a barrel", you need to cut a small hole for a blender in the upper part of the fruit, immerse it inside and beat the pulp. Then add rum or any other kind of alcohol, mint and lime and insert straws.

Whatever way you are going to cook the watermelon, it is important to remember that it must be washed first, otherwise when the peel is cut, the bacteria from the surface will get inside to the edible part.

In cosmetology

Unlike official medicine, in cosmetology, watermelon has long received well-deserved recognition. Pulp extract, as well as watermelon seed oil, are used in beauty products for various purposes. For example, due to its high liquid content, the berry is especially valuable for moisturizing products, and the presence of simple sugars (sucrose, glucose and fructose), which contain glycolic acid, justifies its appearance in gentle peeling products. This acid helps to remove the layer of dead cells without damaging the skin underneath.

In addition, watermelon introduces pectins into the chemical composition of cosmetic products, which activate the protective function of the skin and soften the aggressive effects of the environment. Vitamin C and antioxidants give the epidermis elasticity and firmness, thus protecting it from premature aging. Finally, B vitamins stimulate the process of filling cells with oxygen and thus maintain skin tone. Note that watermelon also provides a slight whitening effect, which can be useful for owners of pigmented and freckled skin.

As for watermelon seed oil, then, according to cosmetologists, it has a beneficial effect on hair. Stearic, oleic, linoleic and palmitic acids nourish the curls, and L-arginine affects the blood supply to the hair follicles, stimulating the growth process and, if necessary, starting the recovery process. Due to the content of copper and zinc, products with watermelon seed oil will be especially useful for hair prone to oiliness and active pigment loss (graying). Finally, we note that due to its fresh and slightly sweet aroma, watermelon is often used in both women's and men's perfumes, especially when creating summer scents.

As for the preparation of cosmetics at home, among the most popular recipes, the following can be distinguished:

- To provide a refreshing and tonic effect, it is recommended to freeze watermelon juice in an ice mold and then wipe the skin of the face with it. Wash off the remaining liquid after 15 minutes.
- When acne appears, place 10 g of watermelon seeds in a mortar and grind them well, gradually adding 100 ml of water. Apply to the skin, leave for 20 minutes and then rinse with cool water.
- With roughness and dryness of the skin of the hands, you should cut off the upper part of the watermelon fruit, beat the pulp inside a little with a blender, add a glass of warm milk there and dip your palms into this mixture for a few minutes. Then apply the fatty fraction (any vegetable oil) to the skin.

Dangerous properties of watermelon and contraindications

Moderate consumption of watermelon has a beneficial effect on the body, however, abuse can lead to negative consequences:

- More than 30 mg of that very useful antioxidant lycopene can cause digestive disorders (especially in older people), cause nausea and diarrhea.
- In people with hyperkalemia , large amounts of watermelon can cause muscle spasm and arrhythmias.
- An excess of potassium can also lead to a sharp decrease in pressure.
- A large amount of sugar is a strong glycemic load on the body, especially those suffering from diabetes. It is better to combine eating watermelon with plant foods rich in fiber. This will make the jump in glucose not so sharp.
- With kidney problems, large portions of watermelon can provoke severe edema, since the liquid simply cannot quickly leave the body.
- Watermelon seeds contain so-called antinutrients (phytins , tannins, trypsin inhibitors an enzyme that breaks down proteins), so it is better to use them not raw, but dried or fried.

Selection and storage

Determining the period from which it becomes safe to buy watermelons and choosing a good ripe berry is not difficult, although surrounded by many myths. It is best to start eating watermelons with the beginning of the season, that is, in August. Of course, there are also early ripening varieties that ripen earlier, but there are relatively few of them on the market, but the probability of running into a fruit whose growth was forced by fertilizers is quite high.

It should be noted that almost all melon growers use nitrogen fertilizers when growing watermelons, but the main thing is not to exceed the permissible norms. With an excess of nitrogen, the fruit ripens quickly, but it contains a large amount of nitrates. In the same way, unripe berries are dangerous. Nitrates from fertilizers must go through a period of bound form and excretion, and in the case of an early harvest, harmful substances do not have time to do this and remain inside.

Despite the fact that there can be an excess of nitrates in watermelon and this is not very beneficial for the body, it is almost impossible to get poisoned by them. The allowable intake of nitrates by a person weighing 60 kg is 300 mg. Even in the most "contaminated" watermelon fruit, there are approximately 270-280 mg of harmful substances per 1 kg of pulp. For comparison, up to 1000 mg of nitrates / 1 kg are sometimes found in meat, and up to 2500 mg / 1 kg in greenhouse spinach and arugula .

Poisoning, which is usually associated with the use of watermelon, does happen, but not at all due to nitrates, but rather due to poor hygiene. Nausea, abdominal pain, and diarrhea are symptoms that accompany intestinal infections that are caused by the ingestion of bacteria living on the surface of unwashed vegetables and fruits. When cut, they fall on the pulp, and then into the gastrointestinal tract. So you should wash the watermelon well and thoroughly before use.

When choosing a fruit, you should pay attention to the peel: it should not be damaged or dented. The surface of a ripe watermelon is usually shiny and bright green, but on one side there should be a yellow-brown (earthy) spot - the place on which the watermelon lay when ripening. It is quite normal when there is a bee cobweb on the peel of a watermelon - thin ornate gray-brown stripes . It is believed that this is a sign of the special sweetness of the fruit. The tail or the place where it is attached must be dry, and the sound when tapped must be sonorous.

As for the storage of watermelon, after cutting it can be kept in the refrigerator for no more than 3-4 days. By the way, inventive lovers of this berry came up with a useful life hack - cover the remaining half of the watermelon with a shower cap. Due to the gum, it holds well and protects the flesh from chapping.

At room temperature, a whole watermelon can lie on average for about 2 weeks, but the timing depends on the degree of its maturity. Interestingly, this fruit can be preserved even until the New Year. To do this, it must either be placed in a net and hung, or placed on shelves, wrapped in straw, in a dark and cool (4-5 ° C) room. True, as scientists have found out, under conditions with a low temperature in watermelons, the content of lycopene decreases (from 8.1-12.7 mg/100 g to 7.8-8.1 mg/100 g)^[17].

Varieties and cultivation

Previously, it was believed that watermelon can grow only in a hot southern climate. However, the work of breeders made it possible to grow this berry in less favorable conditions, the main thing is to choose the right variety for your region. The melon should be located on the south side of the site and protected from strong winds. Note that the proximity of groundwater is unacceptable, and for a better outflow of fluid and warming up the earth, you can even make beds 15 cm high. Sandy or sandy soil is best suited for the structure.

You can sow watermelon directly into the ground when the temperature has reached 15-16 ° C, and the earth has warmed up about 10 cm deep. Watering the plant may occur infrequently, but should be plentiful (about 3 buckets per 1 square meter). During the flowering period, moisturizing should be carried out 2 times a week, and during ripening, watering is no longer required.

The varietal variety of watermelons is amazing: you can choose a berry for almost any climatic conditions. They will differ in terms of vegetation, frost and drought resistance, but taste characteristics and appearance remain basically unchanged. Although there are some exceptions.

For example, breeders managed to bring out "moon" watermelons with yellow flesh. And on the Japanese island of Hokkaido, watermelons of the Densuke variety grow . Their peel is dark green without stripes, which is why they are also called black. In one season, a very small amount of fruits are harvested there, but it is believed that they have a special sweetness. This explains their average price of \$ 250 for a 6-7 kg berry, and the largest black watermelon was sold at auction for \$ 6,100. Usually sold in stylish black boxes, they are considered a very valuable gift.

In addition, there are varieties in which seeds are completely absent (we are not very common, but in Europe they make up 80% of the market). In some countries, tiny portioned berries (about 10 cm in diameter) have gained popularity. Also, Japanese melon growers are actively experimenting with the form, growing pyramidal and cubic fruits. By the way, if pyramid watermelons were created, rather, for marketing purposes, then the appearance of cube watermelons is explained by quite practical considerations. Such berries take up much less space and are more convenient to transport.

You can grow a cubic fruit in your garden. At the moment when the ovary reaches the size of an apple or a tennis ball, it is covered on top with a plastic cube (designed for 4-5 kg) with transparent walls and holes for air to penetrate. When the berry fills the entire space, the cube is removed and the fruit is left to ripen.

In general, watermelon is not just a refreshing water, but a source of essential amino acids, antioxidants, vitamins and minerals. It is low in calories and fat, but has fiber. These berries have long been used in cosmetology, and now their properties are being actively studied by doctors. When consumed in moderation, watermelon contributes to the normal functioning of the cardiovascular and digestive systems, it also contributes to the antioxidant defense of the body and helps prevent the development of many chronic diseases.

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An extended HTML version of the article is available on the edaplus.info website.

Watermelon - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of watermelon 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 watermelon is considered in various types of medicine and the effectiveness of its use in various diseases. Potentially adverse effects of watermelon analyzed separately on the human body under certain medical conditions and diseases. Considered scientific basics diets With his application.



Pear (lat. Pýrus)

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Abstract. The article discusses the main properties of the pear 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 pear in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of pear on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its application are considered.

Keywords: pear, benefit, harm, beneficial properties, contraindications

Beneficial features

Main Pear canned in light Fresh pear [1] Dried pear [2] syrup [3] substances (g/100 g): 83.96 Water 26,69 84.46 15.23 69.70 15.17 Carbohydrates 9.75 62.20 12.10 Sugar

Table 1. The chemical composition of the pear (according to <u>Food+</u>).

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Squirrels	0.36	1.87	0.19
Alimentary fiber	3.1	7.5	1.6
Fats	0.14	0.63	0.03
Calories (kcal)	57	262	57
Minerals (mg/100 g):			
Potassium	116	533	66
Phosphorus	12	59	7
Calcium	9	34	5
Magnesium	7	33	four
Sodium	one	6	5
Iron	0.18	2.10	0.28
Zinc	0.10	0.39	0.08
Vitamins (mg/100 g):			
Vitamin C	4.3	7	0.7
Vitamin PP	0.161	1.372	0.154
Vitamin E	0.12	0.06	0.08
Vitamin B6	0.029	0.072	0.014
Vitamin B2	0.026	0.145	0.016
Vitamin B1	0.012	0.008	0.010
Vitamin A	0.008	0.001	0

It should be borne in mind that the concentration of all minerals and some vitamins increases (often 4-5 times) in dried pear fruits. However, at the same time, the calorie content of the fruit also increases by the same 4-5 times due to a noticeable increase in the amount of sugar, so people who build their diet should take into account that fresh and dried pears in the diet cannot be considered interchangeable products.

Medicinal properties

The medicinal properties of pear pulp are not due to the vitamin composition (there are relatively few vitamins in this fruit), but, first of all, the presence of:

- **dietary fiber** (pectin), which improves bowel function, is responsible for the elimination of harmful substances and toxins, lowers cholesterol;
- **potassium**, a heart-healthy mineral, thanks to which the pear demonstrates a slight diuretic effect;
- **folic acid** (up to 0.2 mg / 100 g, which is more than in apples and plums) and cobalt hematopoietic elements involved in the formation of new cells;
- **arbutin** (up to 60 mg / 100 g in some varieties), which can prevent the development of pathologies of the kidneys and bladder.

One fruit of a moderately ripe pear contains up to 15-18% of the daily fiber requirement. These coarse indigestible fibers are necessary for the life of beneficial bacteria in the stomach, the activity of which largely determines the state of the body as a whole. Also, coarse fiber in the intestines acts as a cleansing sponge, stimulates the contraction of the intestinal walls, lowers cholesterol levels by binding its precursors (fatty acids), and can reduce the activity of sugar absorption. However, the riper (and, accordingly, softer) the fruit, the less coarse fibers remain in it.

Pear skin contains bioflavonoids, tannins, and arbutin, which has antiseptic properties. They provoke protein coagulation of bacterial cells, promote healing of damage to the mucous membrane of the alimentary tract. Since the fruits exhibit both antimicrobial and diuretic effects at the same time, the pear is useful in case of urinary tract infections.

In terms of quantity and quality of sugars, a pear is generally similar to an apple. However, in terms of the content of sorbitol (sweet glucite that replaces sugar), the pear is noticeably superior to its fruit competitor. There is especially a lot of sorbitol in the juice of unripe pear fruits, which is important for diabetics who use this food product as a sweetener. The pear is also ahead of the apple in terms of the content of chlorogenic acid (30-80 mg / 100 g), which gives the fruits diuretic and capillary - strengthening properties.

The controversial ability of pears to cause both a laxative and a fastening effect is widely discussed on the Internet. The reason for this is called different methods of processing the fetus - it is believed that fresh pear in large quantities provokes diarrhea, and pear broth, on the contrary, normalizes emptying. Representatives of the Clinic of the Research Center for Nutrition and Biotechnology explain this paradox by the different composition (and, accordingly, action) of the fruit pulp and its peel.

Pear pulp really has a laxative effect, so it can be eaten with constipation. But the skin of the fruit, which contains tannins, on the contrary, demonstrates a fastening function and is able to stop diarrhea and diarrhea. But since tannins manifest themselves more brightly in decoctions, such a "medicine" from the skin of a pear will act more efficiently than a raw fruit. At the same time, the pulp from a decoction or compote with diarrhea should still not be eaten - it can provoke the opposite effect.

In medicine

In pharmacology, components obtained from various parts of fruits and plants are used. So, the peel of this fruit is rich in biologically active substances that have antiseptic properties, contains tannins, bioflavonoids. Arbutin (a glycoside found in the skin of the pear and even more in the leaves of the tree) is part of the medical preparations used to treat the urinary tract and kidneys.

Numerous nutritional supplements are produced based on pear components. And the Ukrainian manufacturer uses a concentrate of *Pyrus* tree shoots as a base element for his Forest Pear balm. *pyraster* - wild pear, popularly called " soletrus ". The balm is declared as a powerful antitumor, wound healing, antirheumatic, antifungal and bactericidal agent. One bottle (20 ml) is enough for a course of treatment with the recommended intake 3-4 times a day, 1-2 drops of balm per glass of water.

In folk medicine

Even the ancient Greeks, creating the traditions of European folk medicine, actively used pear fruits for the prevention and treatment of various diseases and conditions. They even saved themselves from seasickness by continuously sucking pieces of these fruits, due to which the characteristic signs of motion sickness disappeared - nausea and dizziness. The pear was also used as a medicine for mushroom poisoning. And pear seeds were used as an antihelminthic.

Modern adherents of naturopathy actively use both the fruits themselves and pear juice:

- treatment of urolithiasis and removal of inflammatory processes in the bladder;
- therapy for inflammatory lesions of the prostate;
- restoration of pancreatic function;
- normalization of the action of the heart muscle;

- activation of hematopoietic processes;
- stimulation of the kidneys and liver.

Some of these diseases and conditions are manifested by symptoms that may be the basis for the appointment of folk pear therapy. So, for example, fatigue, muscle pain, palpitations, sensitivity to cold, dizziness and loss of appetite may be signs of pathology of blood formation, problems with blood vessels and capillaries, or disorders of the heart, which becomes indications for treatment using decoctions and infusions of pears in as a therapeutic agent.

Pear, as one of the main medicinal ingredients, is also used by traditional healers in diagnosing urological inflammation and intestinal disorders. In addition to the fact that dietary fiber activates intestinal motility, tannins deprive pathogenic bacteria of mobility. In general, we must remember that the pulp in large quantities will help to relax the digestive system, and the peel and decoction of the leaves, on the contrary, will strengthen it.

Decoctions

For decoctions, a "wild pear" is more often used, the fruits of which are rarely eaten, but often, together with the plant part of the tree, are used in various folk medicinal practices.

- Escape from osteochondrosis. 1-2 young pear branches should be cut into pieces (5-10 cm long) and boiled in a liter of water (if necessary, the amount of raw materials increases proportionally). After boiling, the shoots are kept for another 20-30 minutes on low heat, after which the broth should cool and infuse for two hours. Then the raw material is removed, the liquid is filtered and taken daily for a month. Before a second course, take a two-week break.
- Dried pears for prostatitis. Dried pear fruits in the recipe are taken at the rate of 100 g per half liter of water. Dried fruits are first filled with water (about 30 C), infused for about half a day and only then sent to the fire until boiling. After cooling, the decoction is taken half a glass three times a day until symptoms are relieved.
- Dried pear skin for gastrointestinal upset. Half a glass of chopped dry skin is mixed with 3 tablespoons of oatmeal and poured with 0.5 liters of boiling water. The mixture is boiled for 15-20 minutes, and then cooled and infused for about an hour. The filtered liquid is taken half a glass before meals until the normal functioning of the gastrointestinal tract is restored.

Similarly, using dried pears with pulp and oatmeal, decoctions are prepared, which traditional healers recommend taking for allergies. Only in this case, usually porridge in a larger volume (100 g / 1.5 l) is boiled separately and mixed with pear broth (100 g / 1 l) after cooling. Drink one glass twice a day.

infusions

In folk medicine, infusions from the pulp of fresh and dried pears, leaves and flowers of the plant are used by healers to treat a wide range of diseases from prostatitis to adenoma.

- Infusion of dried fruits from adenoma. For the treatment of benign tumors of the glands, modern healers recommend pouring 250 grams of dried fruit with a liter of boiling water and leaving it in a thermos for 8-9 hours. After aging in hot water, the fruits are ground and filtered. Take the remedy should be 4 times a day for a quarter cup.
- Leaf infusion for rheumatism. 2 tablespoons of dried leaves are poured into a glass of hot water and aged for 2 hours. "Medicine" is taken three times a day, 2 tablespoons.
- Infusion of leaves for dermatitis and rashes. An agent for external use is recommended as an anti-inflammatory in the treatment of oily facial skin with seborrhea, as well as with dermatitis. The astringent properties of the infusion help to reduce the treatment time for teenage acne. To

prepare the infusion, dried leaves collected during the flowering period of the plant are usually used. They are poured with boiling water at the rate of 25-30 g per 100 ml and allowed to brew for 5-8 hours.

- Infusion of leaves from prostatitis. For infusion, you will need about 1/3 cup of dry leaves, which are poured with boiled water for 5 hours. After straining, the infusion is recommended to be taken daily until cured.
- Infusion of flowers from prostatitis. Flowers are taken at the rate of 30 g per 250 ml glass of boiling water. The flowers filled with hot water are infused for 10 minutes. Then the infusion is divided into 3 servings and drunk throughout the day.

in oriental medicine

Pear fruits came to the attention of ancient Chinese healers at least 2 thousand years ago. However, in those days, all medical treatises spoke, first of all, about the possible harm of pears. In particular, a 3rd-century collection entitled " Herbalism Wu Pu " warns that pears should not be eaten by pregnant women, women after childbirth, the sick, and all people with stab and cut wounds. Even healthy people, according to the author, with excessive use of pears risked getting sick. A 12th-century book, The Expanded Meaning of Herbalism , clarified that if these fruits were consumed in excess, damage to the spleen would occur. And only drunkards can love pears, because these fruits quench their thirst.

This attitude is largely provoked by the place of the pear on the famous Yin-Yang scale. The closer the food product is to the value of the equality of the two principles - to zero on a scale from -3 (Yin) to +3 (Yang), - the more useful it is. However, the pear has a value of -3, concentrating the maximum Yin (feminine), so this fruit is contraindicated for people with a good balance.

In the later medical writings of Chinese healers, the attitude towards the pear begins to be gradually revised. Progressive specialists for their time, one after another, begin to admit the possibility of using a pear in certain conditions in the treatment of specific diseases. In the book of 1409, "Recipes for all kinds of help," there is such a recipe for "Drink for the treatment of diabetes": from the fruits of one of the three varieties (e-li, yang - shui -li or jiang - nan - xue - li), juice is squeezed out, boiled with honey, bottled and sometimes taken after dissolving in cold or hot water. After recovery, the drug should be stopped.

A detailed description of the use of pears was left in his herbalist of 1590 by the famous healer Li Shizhen . He collected several cases of almost magical cures for diabetes described in various sources, after which he reasonably doubted that the influence of pears was as harmful as it was claimed in ancient medical treatises. In particular, the stories cited tell of people who were considered hopelessly ill, but healed either by a horse veterinarian, or by a monk, or by a doctor. In these stories, patients were advised to eat fresh pears if possible, but if it doesn't work out, then at least drink pear juice or soak dried fruits in boiling water.

The cumulative experience of using pear in traditional Chinese medicine can be summarized in the following recommendations:

- Pears can and should be eaten with a syndrome that is called "heat syndrome" in Chinese and Tibetan medicine. This syndrome can also include manifestations of diabetes, and in addition to them, such signs as the desire for coolness, dry mouth (which you want to relieve with cold water), redness of the face and tongue (up to raspberry color).
- Pears are acceptable (but in moderation) to get rid of a hangover and thirst in the summer heat.
- These fruits are contraindicated in the "cold syndrome", which is manifested by chills, freezing of hands and feet, a pale tongue, and a desire to warm up with hot drinks.

• It is undesirable to include pear fruits in the diet after childbirth and with significant blood loss, accompanied by pallor, dry skin, dizziness, and tinnitus.

Cough syrup made from pears is still very popular in China. But its use also depends on the nature of the cough and the underlying syndrome. So, with the "heat syndrome", which is characterized by a cough with viscous and difficult to separate dark yellow sputum, the syrup is indicated. And with the "cold syndrome" with a cough, accompanied by copious secretions of rare pale sputum, it is forbidden to drink such a syrup.

Ancient Arab healers also used a boiled or baked pear for lung diseases to relieve the cough reflex. Pear tree resin was also used for this, washing down a few grams of gum with water.

In scientific research

In recent years, in scientific research on pears, scientists were mainly interested in the effect of the fruit on the cardiovascular system, antidiabetic, anti-inflammatory, antioxidant properties, as well as the ability of the fruit to reduce the risk of developing certain cancers.

- A large-scale statistical study conducted by members of the European Prospective investment into Cancer and Nutrition (EPIC) for 8 years, studying the eating habits of almost half a million people, has revealed some of the relationship between diet and the occurrence of lung cancer. So it was found that in the group of non-smokers, the consumption of fruits (and especially pears and apples) reduced the risk of this disease, despite the fact that no such dependence was found for vegetables. (In the group of smokers, however, the incidence of lung cancer was lower in people who actively included vegetables in the diet)^[4].
- More recently, in 2019, American scientists studied the effect of daily consumption of fresh pears on the heart condition of middle-aged and older people. In a placebo-controlled clinical trial over 3 months, there was a trend towards a slight decrease in blood pressure at the time of contraction of the heart muscle, and a significant decrease in pulse pressure (this is the difference between the pressure at the time of contraction and relaxation of the heart muscle). In addition, a qualitative decrease in waist circumference was recorded in the group of subjects who daily received two fresh medium-sized pears for meals. ^[5].
- The ability of biologically active components derived from pears to exhibit anti-diabetic properties was tested on laboratory mice. During the experiment, the ability of pear extracts to stabilize the development of type 2 diabetes was established. Moreover, when comparing the concentration of active components in the pulp and peel of a pear, a significant predominance of these components in the peel was recorded (2-18 times, depending on the variety) ^[6].
- An in vitro laboratory study conducted by Chinese scientists revealed which popular varieties in this country show the highest antioxidant activity, and which show the most pronounced anti-inflammatory effect. Experts have established a direct correlation between the high concentration of triterpenoids in the Dangshansu variety and the anti-inflammatory abilities of the fruit. Also, a very high content of phenols, flavonoids and various anthocyanins was noted in the Xuehua and Nanguo varieties , which determined their special antioxidant capabilities ^[7]

Scientists are generally quite often interested in the antioxidant capabilities of pears and products based on them (for example, chips), which indirectly indicates the high potential of this fruit in the fight against free radicals that provoke lipid oxidation that is dangerous for health, damage to membranes (at the cellular level) and vessel walls.

Weight regulation

The pear seems too sweet to be considered an effective weight loss aid with so many sugars. Meanwhile, fresh pear fruits have only 40-60 kcal (depending on the variety), and no more sugar than apples, which simply seem less sweet due to the acids they contain.

There is a popular 7 day diet that uses pears as one of the main ingredients. It is believed that with its help, without harm to health, you can "lose" up to 5 kg.

1-2 day:

- Breakfast: 250 ml of yogurt with rye bread, 2 pears.
- Lunch: boiled chicken breast (100 g), 3 tablespoons of boiled rice.
- Dinner: 2 pears.
- A cup of green tea without sugar before bed.

3-4 day:

- Breakfast: 2-3 rice cakes, 1 pear.
- Lunch: 50 grams of hard cheese with rye bread.
- Dinner: 2 pears.
- Before going to bed 150 g of cottage cheese.

5-7 day:

- Breakfast: 150 grams of boiled beef with 50 grams of buckwheat porridge.
- Lunch: salad of 2 pears and grated carrots.
- Dinner: 2 pears.
- Before going to bed, a salad of 2 eggs with vegetables, seasoned with olive oil.

Brazilian researchers in an experiment tried to evaluate how much a low-energy diet with the addition of pears helps women in their 30s-50s lose weight. In a practical study for 2.5 months, the diet of the three groups was added to the same number of calories servings of pear, apple and oatmeal cookies. Despite the equality of calories, fruit supplements helped to lose weight more effectively ^[8].

In cooking

On the dinner table, the pear goes well with a mass of foods that at first glance seem incompatible with sweet juicy fruit: cheeses, pork, beef, chicken, nuts and seasonings (spices), which are primarily associated with meat dishes.

- Pear and cheese. An old French proverb says: "Never has the Lord entered into a more perfect marriage than the union of a pear and cheese." Particularly harmonious are the combinations of dense meaty Bosc and mature cheddar, as well as Comice with brie cheese. Blue cheeses can outshine a tender pear, but sweet firme d' amber with "milky" undertones and an elusive musty aroma suits the pear very well. The description of the Spanish grazalema cheese (Grazalema) mentions "notes of ripe pears", which in itself indicates the compatibility of this goat cheese with pears. An excellent partner for a pear is the brine livaro Normandy cream cheese with its "smell", which captures strong spicy notes.
- Pear and pork. The culinary experts call pear and prosciutto, Italian salted ham, an ideal pair. They can be combined without additional ingredients, but they are often combined in salads, pizzas, panini (hot sandwiches). Unlike an apple, a pear goes better not with fatty meat, but with well-done small pieces.

• Pear and beef. With beef, pear fruits are combined in at least two popular Asian dishes. Yukhe is made from finely minced raw beef fillets that are marinated in spicy soy sauce and then served with nashi (Asian pear) slices. In bulgogi, before frying, thinly sliced beef is already marinated in grated pear, rice wine, sesame oil and lemon juice with spices.

The brand product for some cantons of Switzerland has become the so-called "pear honey", which is the juice of the pear " Tylers " strongly thickened to a viscous (honey) state. This variety entered the classic recipe because it was very common in the canton of Lucerne and was perfect for brewing. But for the manufacture of honey at home, you can replace this pear with a variety similar in characteristics. The main thing is that the concentrate is sweet and juicy, use still firm, not overripe fruits, which, nevertheless, have already begun to darken and fall off.

After squeezing the pear juice is filtered through a large sieve to separate large pieces of pulp, poured into a copper basin and sent to the basement for the night. During this time, coarse fibers ("noise") manage to rise to the surface, which must be collected, and put the juice cleared of "noise" in a basin on fire for 6 hours, collecting foam before boiling. Such dark brown honey with milk in the middle of the last century during the war was replaced by coffee with milk.

But for lovers of such sweets and pear-flavored lollipops, there is one warning: the isoamyl acetate fruit ester present in sweets is called the "bee attack pheromone", since it is with its help that insects transmit information about the threat and the need to defend themselves. Therefore, bees, catching the smell of pear sweets, can behave aggressively.

In cosmetology

Pear fruit extract often appears as an ingredient in cosmetics in creams and serums of anti-aging series and products for the care of problem skin. There it helps to reduce the size of pores, normalizes the secretion of sebaceous glands, improves metabolic processes, enriches the skin with organic acids.

The ability of the ingredients contained in the pear to fight inflammatory processes is also used in home cosmetology.

- **Healing elixir.** The product is made from pear skin (50 g per liter of water). The skin is cut off from fresh fruits and boiled over a fire for about 30 minutes, after which it is still infused for about 2 hours. Before applying to sores and wounds, the mixture is filtered.
- **Rejuvenating mask.** The pear is peeled, and the pulp is crushed to a mushy state. One teaspoon of orange juice, honey and cream is added to this mass. After mixing, the composition is applied to the face for a quarter of an hour. The mask is washed off with warm tea leaves (usually green tea). To restore tone and open pores, you can additionally wipe the skin with an ice cube.
- **Purifying mask.** The pulp of one ripe pear is mixed with oatmeal. The amount of flour depends on the juiciness of the fruit. The main goal after stirring is to get a thick slurry. After a 15-minute hold on the face, the mask is washed off with cool water.

Dangerous properties of pears and contraindications

The pear has several properties that, to varying degrees, make these fruits undesirable for inclusion in the diet. For example, it is forbidden to eat pear fruits in acute and chronic pancreatitis (inflammation of the pancreas). This is due to the presence in the pulp of even the most ripe fruits of sclereids - stony cells - dead tissues with lignified thick shells. Their walls are sometimes impregnated with lime, an indigestible form of wax (cutin), or silicon dioxide (silica).

Due to their rocky cells, an excess of pears is considered a "heavy" food, even for people with healthy gastrointestinal tracts. People suffering from exacerbations, all the more should refrain from diversifying their diet at the expense of these fruits. Moreover, the ban applies to baked fruits and mashed pear pulp - stony cells are still preserved there.

To aggravate the aggravating effect of a pear (if there are already health problems), its "neighborhood" in a plate with meat products can potentially also. In addition, it is not recommended to drink raw pear pulp with water so as not to provoke diarrhea, do not eat it on an empty stomach and / or immediately after eating.

The abundance of fiber in foods, as a rule, favorably affects the condition of the body. However, the abuse of foods containing a lot of indigestible fibers can provoke intense gas formation, accompanied by painful spasms.

The abundance of sugars in pear pulp is also attributed to the potentially dangerous properties of this fruit. However, it is not entirely correct to compare fruit sugars with sugars in sweets or cakes, since in a pear they are associated with dietary fiber and are absorbed less actively.

Selection and storage

When buying pears in a store or on the market, you should focus on the appearance, smell and density of the fruit. There should be no external damage, dents and wormholes on the skin (worms are found from time to time in homemade pears, although less often than in apples). To assess the quality and ripeness, you need to lightly press on the fruit and smell it. Too hard pulp without aroma indicates that it is an unripe fruit. And excessive looseness may indicate the beginning of the process of decay. However, in the case of a pear, it is better to purchase unripe than overripe fruits.

Hard fruits ripen relatively easily, even if they are simply kept at room temperature for several days (they do not need to be washed first). But this process can be accelerated if you pack pears along with apples and / or bananas in one paper bag. "Neighbors", releasing ethylene (a gas, which is also called the "natural ripening hormone"), will share it with pears.

Soft ripe fruits at room temperature may, on the contrary, begin to rot. In order to slow down this process, fruits are placed in the refrigerator, extending their shelf life by 4-5 days. One more day can be won if the pear that has begun to darken is poured with lemon juice. But in general, pears are stored relatively poorly, and even low temperatures do not save these fruits from loss of quality.

China, which has long been considered the undisputed world leader in the production and export of pears, sponsors numerous studies of this product, aimed, among other things, at better preservation of value characteristics. So, a recent study conducted on frozen pears of one actively exported variety showed a qualitative loss of fruit flavor during prolonged freezing (hexylhexanoate disappeared completely, and the content of another 5 aromatic elements significantly decreased). The same study found an increase in saturated and a decrease in unsaturated fatty acids after prolonged freezing ^[9].

Recently, the efforts of Chinese scientists have led to the discovery of another, more gentle and already chemical, way to extend the life of fruits taken from a tree. If the fruits are treated with 0.1 mM melatonin, then storage at a temperature of +4 °C simultaneously slows down the growth of microorganisms, and increases the overall antioxidant capacity of pears, and inhibits the loss of ascorbic acid ^[10].

If it becomes necessary to keep pears at home for as long as possible (within several months), then you can resort to the following proven methods of experienced gardeners:

- Choose only autumn and winter varieties for bookmarking.
- Remove pears from the tree at the stage of technical maturity still greenish, without waiting until they fall off on their own. When harvested by hand, it is possible to protect the fruits from mechanical shocks and keep the stalk intact.
- Store in well-ventilated dry rooms at a temperature of about 0-2 °C. If the humidity is very high (above 80-85%), a bucket of quicklime left in the storage (basement, cellar) will help get rid of it, as well as excess odors.
- Separate pears from other vegetables and fruits. But the pear fruits themselves should not be in close contact with each other. Therefore, they are placed in boxes or boxes with holes for ventilation, and each layer is sprinkled with sawdust or sand.
- From time to time sort through the folded fruits to reject spoiled pears.

Before putting fruits in boxes, they are often laid out directly on the floor for 0.5-1 week, covering the crop with newspapers. And then each fruit is wiped dry and sent to the box. Sometimes pears are stored on wooden racks, the bottom layer of which is raised from the floor by 15 cm or more. At the same time, they are laid out with their stalks up.

Varieties and cultivation

The pear loves light and warmth. In shaded areas, the tree both grows and bears fruit poorly, so it is often planted in the southern, western or southwestern parts of the garden. The thermophilicity of the pear until recently presented certain problems for its cultivation in the northern regions, but the work of breeders who created hybrids resistant to low temperatures made it possible to grow this plant in Western Siberia, the Urals, and also in the cold northeastern part of China.

Unlike more unpretentious, cold-resistant plants, southern pears have a developed root system capable of penetrating into deep layers of the soil, which causes both large planting pits and the quality of unwetted soil.

To date, breeders have bred about 3,000 pear varieties. Some of them appeared as a side effect of other research activities. So, for example, the French gardener Louis Bosca, bred a variety named after him, by chance, just fighting weeds. There are 69 botanical species of this plant alone, although most cultivars represent only one of them - Pyrus communis . It also includes the following varieties, which made up the top 5 of our "pear" rating:

• "Bartlett ". The pear was bred by the pious and generous English farmer Williams Bon Chretien , who spent the proceeds from the sale of seeds on charitable work and the construction of churches. But overseas, this variety is better known by the name of the merchant Bartlett . This variety is considered the sweetest and juiciest in the world. Since the 19th century, there was a rule of table etiquette, according to which this pear was served to the table only in sliced form, because it was almost impossible to bite off a whole fruit without staining yourself with juice. In restaurants, the Bartlett pear was always served with a large number of napkins.

Over time, it was this variety that became the most popular in North America. The color of its fruits can vary from pale yellow to reddish, depending on the growing conditions. But since most Americans consider only yellow and green fruits to be true pears, the red varieties of the fruit are more common in restaurants, where the "exotic" color can be charged a higher price.

• Starcrimson . _ Also very juicy, sweet and fragrant pear. There are fruits from bright red to dark crimson shades. The variety appeared back in the 50s of the last century, but has not yet received wide distribution, taking the place of an expensive delicacy on the market. It is usually ordered in limited quantities in order to sell for 10-15 dollars for one such organic fruit.

- Williams . _ One of the most famous and popular varieties, the first mention of which dates back to the 1770th year. Then its name was a little different " Williams Christ ." But this pear was made famous by another person with the same surname Richard Williams, who in 1816 presented it to the London Horticultural Organization. A few years later, the variety began to spread throughout Europe and the world, and not without reason: its sweet pulp melts in your mouth, and the taste is distinguished by a shade that is called "Williams-note".
- "Duchess". This word is translated from French as "duchess". In the world, "Duchess" has been known among gardeners since 1845, and in the territory of the post-Soviet space, the name of this variety flaunted on the label of a popular pear-flavored soda and was known to every child. For the sweet juicy pulp, "Duchess" is still in the top of the most popular honeycombs in the world today.
- Forelle . _ Completes the rating, "in contrast", a very tough pear with firm flesh and low sugar content. It is used most often in low-calorie confectionery. And yet, the laws of some states still prohibit the use of the fruits of this variety as projectiles for throwing. Local farmers call it the "combat grenade". " Forelle " has excellent ballistic characteristics: it flies far, and because of its hardness, it can cause serious damage when it hits.

It is difficult to list all the interesting pears. There are, for example, fruits without seeds inside. As a rule, this is the harvest of single-varietal pear plantations of those pears that are prone to seedless fruiting (for example, the Conference variety). In addition, even at the flowering stage, such trees are sprayed with fruit formation biostimulants, which ultimately makes it possible to grow a "shop" pear without a stone. The chemical stimulants involved at this stage completely and completely disappear by the time the fetus ripens.

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Pear - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of the pear 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 pear in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of pear on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With her application.



Vitamin K - description, benefits, effects on the body and the best sources

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Abstract. The article discusses the main properties of vitamin K and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of vitamin K are indicated . The use of vitamin a in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of vitamin K on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: vitamin K, vitamin K , benefit, harm, beneficial properties, contraindications

The international name is 2-methyl-1,4-naphthoquinone, menaquinone, phylloquinone.

Discovery history

Vitamin K was discovered by accident in 1929 during experiments on sterol metabolism, and was immediately associated with blood clotting. In the following decade, the major K vitamins, **phylloquinone** and **menaquinone**, were isolated and fully characterized. In the early 1940s, the first vitamin K antagonists were discovered and crystallized with one of its derivatives, warfarin, which is still widely used in modern clinical settings.

However, significant advances in our understanding of the mechanisms of action of vitamin K occurred in the 1970s with the discovery of γ - carboxyglutamic acid (Gla), a new amino acid common to all vitamin K proteins. This discovery not only served as a basis for understanding early findings about prothrombin, but also led to the discovery of vitamin K-dependent proteins (VCPs) that are not involved in hemostasis. The 1970s also marked an important breakthrough with regard to our understanding of the vitamin K cycle. The 1990s and 2000s were marked by important epidemiological and interventional studies focusing on the translational effects of vitamin K, especially in bone and cardiovascular diseases ^[2].

Product	Vitamin K content (µg/100 g) ^[3]
dried thyme	1714.5
Parsley	1640
Chard	830
Dried marjoram	621.7
Spinach (fresh)	482.9
Basil	414.8
curly cabbage	389.6
goose liver	369
fresh coriander	310
mustard leaves	257.5
Chicory	231
green onion	207
Brussels sprouts	177
lettuce	126.3
Rucola	108.6
beef liver	106
Broccoli (fresh)	101.6
White cabbage	76
Black Eyed Peas	43
Asparagus	41.6
Kiwi	40.3
Chicken meat	35.7
Cashew nuts	34.1
Prunes	26.1
Green pea	24.8
Iceberg lettuce	24.1
Avocado	21
Blueberry	19.8
Blueberry	19.3
Pomegranate	16.4

Foods rich in vitamin K

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Cucumber	16.4
Dried dates	15.6
Grape	14.6
Red currants	eleven

See also <u>Top 100 Natural Sources of Vitamin K.</u>

Daily requirement for a vitamin

To date, there is little data on what the body's daily requirement for vitamin K is. The European Food Committee recommends an intake of 1 μ g of vitamin K per 1 kg of body weight per day. In some European countries - Germany, Austria and Switzerland - it is recommended to take 70 micrograms of vitamin per day for men and 60 kg for women. The American Council on Nutrition in 2001 approved the following requirements for vitamin K: ^[1]

	Recommended amount,	Recommended
Age	men (mcg/day)	amount, women
		(mcg/day)
0-6 months	2.0 µg	2.0 µg
7-12 months	2.5 mcg	2.5 mcg
1-3 years	30 mcg	30 mcg
4-8 years old	55 mcg	55 mcg
9-13 years old	60 mcg	60 mcg
14-18 years old	75 mcg	75 mcg
19 years and older	120 mcg	90 mcg
Pregnancy, 18 years and under		75mcg
Pregnancy, 19 years and older		90 mcg
Lactating, 18 years and under		75 mcg
Lactating, 19 years and older		90 mcg

The need for a vitamin increases:

- **in newborns** : due to poor transfer of vitamin K through the placenta, infants are often born with low levels of vitamin K in the body. This is quite dangerous, as the newborn may bleed, which is sometimes fatal. Therefore, pediatricians recommend administering vitamin K intramuscularly after birth. Strictly according to the recommendation and under the supervision of the attending physician.
- people with gastrointestinal problems and poor digestibility .
- when taking antibiotics : antibiotics can destroy bacteria that help absorb vitamin K^[4].

Chemical and physical properties

Vitamin K is a general name for a whole family of compounds with a common chemical structure of 2methyl-1,4-naphthoquinone. It is a fat-soluble vitamin that is naturally present in some foods and is available as a dietary supplement. These compounds include the phylloquinone (**vitamin K1**) and the menaquinone series (**vitamin K2**). Phylloquinone is present primarily in green leafy vegetables and is the main dietary form of vitamin K. Menaquinones , which are predominantly of bacterial origin, are present in moderate amounts in a variety of animals and fermented foods. Almost all menaquinones , in particular the long chain menaquinones , are also produced by bacteria in the human gut ^[4]. Like other fat-soluble vitamins, vitamin K is soluble in oil and fat, is not completely eliminated from the body with fluids, and is also partially deposited in the fatty tissues of the body. Vitamin K is insoluble in water and slightly soluble in methanol. Less resistant to acids, air and moisture. Sensitive to sunlight. Boiling point - 142.5 ° C. Odorless, has a light yellow color, in the form of an oily liquid or crystals ^[5].

Useful properties and effects on the body

The body needs vitamin K to produce **prothrombin**, a protein and blood clotting factor that is also important for bone metabolism. Vitamin K1, or **phylloquinone**, comes from plants. It is the main form of dietary vitamin K. A lesser source is vitamin K2 or **menaquinone**, which is found in some animal tissues and fermented foods.

Metabolism in the body

Vitamin K functions as a coenzyme for vitamin K-dependent carboxylase, an enzyme essential for the synthesis of proteins involved in blood clotting and bone metabolism, and a variety of other physiological functions. Prothrombin (clotting factor II) is a vitamin K-dependent plasma protein that is directly involved in blood clotting. Like dietary lipids and other fat-soluble vitamins, ingested vitamin K enters micelles through the action of bile and pancreatic enzymes and is taken up by enterocytes in the small intestine. From there, vitamin K is incorporated into complex proteins, secreted into the lymphatic capillaries, and transported to the liver. Vitamin K is present in the liver and other body tissues, including the brain, heart, pancreas, and bones.

In its circulation in the body, vitamin K is carried mainly into lipoproteins. Compared to other fatsoluble vitamins, very little vitamin K circulates in the blood. Vitamin K is rapidly metabolized and excreted from the body. Based on measurements of phylloquinone, the body retains only about 30-40% of the oral physiological dose, while about 20% is excreted in the urine and 40% to 50% in the faeces through the bile. This rapid metabolism explains the relatively low tissue levels of vitamin K compared to other fat-soluble vitamins.

menaquinones are present in the colon . While the amount of vitamin K the body receives in this way is unclear, experts believe that these menaquinones meet at least some of the body's need for vitamin K. $^{[4]}$.

Vitamin K Benefits

- **Bone Health Benefits** : There is evidence of a relationship between low vitamin K intake and the development of osteoporosis. Several studies have shown that vitamin K contributes to the development of strong bones, improves their density and reduces the risk of fractures;
- **maintaining cognitive health** : Elevated blood levels of vitamin K have been associated with improved episodic memory in the elderly. In one study, healthy people over 70 with the highest blood levels of vitamin K1 had the highest verbal episodic memory performance;
- **Heart Aid** : Vitamin K may help lower blood pressure by preventing arterial mineralization. This allows the heart to pump blood freely through the vessels. Mineralization usually occurs with age and is an important risk factor for heart disease. Sufficient intake of vitamin K has also been shown to reduce the risk of stroke.

Healthy Food Combinations with Vitamin K

Vitamin K, like other fat-soluble vitamins, is useful to combine with the "right" fats. Mono- and polyunsaturated fats have significant health benefits and help the body absorb a certain group of vitamins, including vitamin K, which is key to bone formation and blood clotting. Examples of correct combinations in this case would be ^[8]:

- chard or broccoli or kale stewed in olive oil with ginger or garlic butter;
- roasted Brussels sprouts with almonds;
- it is considered correct to add parsley to salads and other dishes, because one handful of parsley is quite capable of providing the body's daily need for vitamin K.

It should be noted that vitamin K is readily available from food, and is also produced in some quantities by the human body. Following a proper diet, which includes a variety of fruits, vegetables, herbs, as well as the correct ratio of proteins, fats and carbohydrates, should provide the body with a sufficient amount of most of the nutrients. Vitamin supplements should be prescribed by a doctor if there are certain medical indications.

Interaction with other elements

Vitamin K interacts extensively with vitamin D. Optimal levels of vitamin K in the body can prevent some of the side effects of excess vitamin D, and normal levels of both vitamins reduce the risk of hip fractures and improve overall health. In addition, the interaction of these vitamins improves insulin levels, blood pressure and reduces the risk of atherosclerosis. Together with vitamin D, calcium is also involved in these processes.

Vitamin A toxicity can impair the synthesis of vitamin K2 by intestinal bacteria in the liver. In addition, high doses of vitamin E and its metabolites can also interfere with vitamin K activity and intestinal absorption^[7].

Application in official medicine

In traditional medicine, vitamin K is considered effective in such cases:

- to prevent bleeding in neonates with low vitamin K levels; for this, the vitamin is administered orally or as an injection.
- treating and preventing bleeding in people who have low levels of a protein called prothrombin; vitamin K is taken orally or intravenously.
- with a genetic disease called insufficiency of blood clotting factors that depend on vitamin K; taking the vitamin orally or intravenously helps prevent bleeding.
- to reverse the effects of taking too much warfarin ; effectiveness is achieved when taking the vitamin simultaneously with the drug, stabilizing the process of blood clotting ^[9].

In pharmacology, vitamin K is found in the form of capsules, drops, and injections. May be available alone or as part of a multivitamin - especially together with vitamin D. For bleeding caused by diseases such as hypothrombinemia , 2.5 - 25 mg of vitamin K1 is usually prescribed. To prevent bleeding when taking too many anticoagulants, take 1 to 5 mg of vitamin K. In Japan, menaquinone-4 (MK-4) is recommended for the prevention of osteoporosis. It should be remembered that these are general recommendations, and when taking any medications, including vitamins, it is necessary to consult your doctor ^[10].

In folk medicine

Traditional medicine considers vitamin K as a remedy for frequent bleeding, hepatitis, cirrhosis of the liver, stomach or duodenal ulcers, as well as bleeding in the uterus. Folk healers consider green leafy vegetables, cabbage, pumpkin, beets, liver, egg yolk, as well as some medicinal plants - rowan berries, shepherd's purse, nettle, yarrow and water pepper to be the main sources of the vitamin.

To strengthen blood vessels, as well as to maintain the overall immunity of the body, it is advised to use a decoction of rose hips and black currants, nettle leaves and lingonberries. Such a decoction is taken in the winter season, for 1 month, before meals.

rich in vitamin K and are often used in folk medicine to stop bleeding, as an analgesic and sedative. Take in the form of decoctions, tinctures, poultices and compresses. Plantain leaf tincture lowers blood pressure, helps with coughs and respiratory diseases. Shepherd's purse has long been considered an astringent and is often used in folk medicine to stop internal and uterine bleeding. The plant is used as a decoction or infusion. Also, to stop uterine and other bleeding, tinctures and decoctions of nettle leaves, which are rich in vitamin K, are used. Sometimes yarrow is added to nettle leaves to increase blood clotting ^[11].

Latest Scientific Research on Vitamin K

• In the largest and most modern study of its kind, researchers at the University of Surrey have found a link between diet and effective osteoarthritis treatment. After reviewing 68 existing studies in this area, the researchers found that a low daily dose of fish oil can reduce pain in patients with osteoarthritis and help improve their cardiovascular health. The essential fatty acids in fish oil reduce inflammation in the joints, helping to relieve pain.

The researchers also found that reducing body weight in obese patients and introducing an exercise regimen also improves osteoarthritis. Obesity not only increases stress on the joints, but can also lead to systemic inflammation in the body. Introducing more vitamin K-containing foods, such as kale, spinach, and parsley, has also been found to have a positive effect on patients with osteoarthritis. Vitamin K is essential for vitamin K-dependent proteins found in bones and cartilage. Insufficient intake of vitamin K negatively affects protein function, slowing down the growth and repair of bones and increasing the risk of developing osteoarthritis [12].

- A study published in the American Journal of High Blood Pressure indicates that high levels of inactive Gla protein (which is normally activated by vitamin K) may indicate an increased risk of cardiovascular disease. This conclusion was made after measuring the level of this protein in people on dialysis. There is growing evidence that vitamin K, traditionally considered essential for bone health, also plays a role in the functioning of the cardiovascular system. Strengthening bones, calcium, in addition, contributes to the contraction and relaxation of blood vessels. If vascular calcification occurs, then calcium from the bones passes into the vessels, as a result of which the bones become weaker and the vessels less elastic. The only natural inhibitor of vascular calcification is the active matrix Gla -protein, which provides the process of calcium attachment to blood cells instead of vessel walls. And this protein is activated precisely with the help of vitamin K. Despite the lack of clinical results, inactive circulating Gla -protein is widely considered an indicator of the risk of developing cardiovascular diseases [13].
- Insufficient vitamin K intake in adolescents is associated with heart disease. In a study of 766 healthy teenagers, those who consumed the least amount of vitamin K1, found in spinach, kale, iceberg lettuce and olive oil, were 3.3 times more likely to have an unhealthy enlargement of the heart's main pumping chamber. Vitamin K1, or phylloquinone, is the most common form of vitamin K in the US diet. "Teens who don't eat green leafy vegetables may face serious future health problems," says Dr. Norman . Pollock , a bone biologist at the Georgia Prevention Institute at Augusta University (Georgia, USA), author of the study. About 10 percent of adolescents already had some degree of left ventricular hypertrophy, Pollock and colleagues report. Usually mild ventricular changes are more common in adults whose hearts are overworked due to

persistent high blood pressure. Unlike other muscles, a larger heart is not considered healthy and can become inefficient.

The scientists believe they have conducted a first-of-its-kind study of the associations between vitamin K and heart structure and function in young adults. Although there is a need to continue to study this problem, the evidence suggests that already at an early age it is necessary to ensure sufficient levels of vitamin K intake in order to avoid the occurrence of further health problems [14].

Use in cosmetology

Traditionally, vitamin K is considered one of the key beauty vitamins, along with vitamins A, C and E. It is often used at a five percent concentration in skin care products for stretch marks, scars, rosacea and rosacea due to its ability to improve blood vessels and stop bleeding. There is an opinion that vitamin K is also able to cope with dark circles under the eyes. Research shows that vitamin K can help fight the signs of aging as well. A 2007 study shows that people with vitamin K malabsorption had pronounced premature wrinkles.

Vitamin K is also useful for use in body care products. Research published in the Journal of Vascular Research shows that vitamin K may help prevent the occurrence of varicose veins. It activates a special protein necessary to prevent calcification of the vein walls - the cause of varicose veins^[15].

In industrial cosmetics, only one form of this vitamin is used - phytonadione . It is a blood coagulation factor, stabilizes the state of blood vessels and capillaries. Vitamin K is also used during the rehabilitation period after plastic surgery, laser procedures, peelings .

There are many recipes for natural face masks that include ingredients that contain vitamin K. Such products are parsley, dill, spinach, pumpkin, berries. Such masks often include other vitamins, such as A, E, C, B6, to achieve the best effect on the skin. Vitamin K, in particular, is able to give the skin a fresher look, smooth out fine wrinkles, get rid of dark circles and reduce the visibility of blood vessels.

- 1. A very effective recipe for puffiness and rejuvenation is a mask with honey, lemon juice, coconut milk and kale. This mask is applied to the face in the morning, several times a week for 8 minutes. In order to prepare the mask, you need to squeeze the juice of a lemon wedge (so that you get one teaspoon), rinse the kale (a handful) and mix all the ingredients (1 teaspoon of honey and a tablespoon of coconut milk). Next, you can grind all the ingredients in a blender, or if you prefer a thicker structure, chop the cabbage in a blender and add all the other ingredients by hand. The finished mask can be placed in a glass jar and stored in the refrigerator for a week ^[16].
- 2. A nourishing, refreshing and softening mask is a mask with banana, honey and avocado. Banana is rich in vitamins and minerals such as vitamin B6, magnesium, vitamin C, potassium, biotin and fiber. Avocados are rich in omega-3s, fiber, vitamin K, copper, folic acid, and vitamin E. They help protect the skin from UV rays. Honey is a natural antibacterial, antifungal and antiseptic agent. Together, these ingredients are a storehouse of beneficial substances for the skin. In order to prepare the mask, you need to mash a banana and avocado, then add 1 teaspoon of honey. Apply to cleansed skin, leave for 10 minutes, rinse with warm water ^[17].
- 3. Famous beautician Ildi Pekar shares his favorite recipe for a homemade mask for redness and inflammation: the composition includes parsley, apple cider vinegar and yogurt. Grind a handful of parsley in a blender, add two teaspoons of organic unfiltered apple cider vinegar and three tablespoons of natural yogurt. Apply the mixture on cleansed skin for 15

minutes, then rinse with warm water. Such a mask will not only reduce redness due to the vitamin K contained in parsley, but will also have a slight whitening effect.

4. For radiant, hydrated and tightened skin, it is advised to use a mask of cucumber and natural yogurt. Cucumber contains vitamins C and K, which are antioxidants, moisturize the skin and fight dark circles. Natural yogurt exfoliates the skin, removes dead cells, moisturizes and gives a natural glow. To prepare the mask, grind the cucumber in a blender and mix with 1 tablespoon of natural yogurt. Leave on the skin for 15 minutes, then rinse with cool water ^[19].

Vitamin K for hair

There is a scientific opinion that a lack of vitamin K2 in the body can lead to hair loss. It helps the regeneration and restoration of hair follicles. In addition, vitamin K, as noted earlier, activates a special protein in the body that regulates the circulation of calcium and prevents the deposition of calcium on the walls of blood vessels. Proper blood circulation in the scalp directly affects the speed and quality of follicle growth. In addition, calcium is responsible for the regulation of the hormone testosterone, which, if not produced, can cause baldness in both men and women. Therefore, it is recommended to include foods rich in vitamin K2 in the diet - fermented soybeans, mature cheese, kefir, sauerkraut, egg yolk, meat ^[20].

Use in animal husbandry

Since its discovery, vitamin K has been known to play an important role in the blood clotting process. More recent studies have shown that vitamin K is also important in calcium metabolism. Vitamin K is an essential nutrient for all animals, although not all sources are safe.

Poultry, especially broilers and turkeys, are more likely to develop signs of vitamin K deficiency than other animal species, which can be explained by their short digestive tract and fast food passage. Ruminants such as cattle and sheep do not appear to require a dietary source of vitamin K due to microbial synthesis of this vitamin in the rumen, one of the stomach compartments of these animals. Because horses are herbivores, their vitamin K requirements can be met from sources present in plants and from microbial synthesis in the gut.

The various sources of vitamin K accepted for use in animal feed are broadly labeled as vitamin K actives. There are two main vitamin K actives , menadione and menadione bransulfite complex . These two compounds are also widely used in other types of pet food, as dietitians often include vitamin K actives in formulas to prevent deficiency. Even though plant sources contain fairly high amounts of vitamin K, very little is known about the actual bioavailability of the vitamin from these sources. According to NRC publication, Vitamin Tolerances of Animals (1987), vitamin K does not result in toxicity when high amounts of phylloquinone , the natural form of vitamin K are consumed. It is also noted that menadione , a synthetic vitamin K commonly used in animal feed, can be added to levels up to 1,000 times the amount , consumed with food, without any adverse effects in animals, with the exception of horses. Injection of these compounds has caused adverse effects in horses, and it is not clear if these effects will also occur when vitamin K actives are added to the diet. Vitamin K and the active substances of vitamin K play an important role in providing essential nutrients to the diet of animals.

In crop production

In recent decades, interest in the physiological function of vitamin K in plant metabolism has grown significantly. In addition to its well-known relevance in photosynthesis, it is increasingly likely that phylloquinone may also play an important role in other parts of the plant. Several studies, for example,

suggest that vitamin K is involved in the transport chain that carries electrons across plasma membranes, and the possibility that this molecule helps maintain the correct oxidation state of some important proteins embedded in the cell membrane. The presence of various types of quinones reductase in the liquid content of the cell may also lead to the suggestion that the vitamin may be associated with other enzymatic pools from the cell membrane. To date , new and deeper research is still being conducted to understand and elucidate all the mechanisms in which phylloquinone is involved. ^[22].

Contraindications and warnings

Vitamin K is more stable during food processing than other vitamins. Some naturally occurring vitamin K can be found in oils that are resistant to heat and moisture during cooking. Vitamin is less stable when exposed to acids, alkalis, light and oxidizing agents. Freezing can reduce vitamin K levels in foods. It is sometimes added to food as a preservative to control fermentation ^[23].

Signs of shortage

Current evidence indicates that vitamin K deficiency is not common in healthy adults, as the vitamin is widely distributed in foods. Those most often at risk of developing a deficiency are those taking anticoagulants, patients with significant liver damage and poor absorption of fat from food, and newborn infants. Vitamin K deficiency leads to bleeding disorders, usually demonstrated by laboratory tests of the rate of clotting.

Symptoms include:

- easy bruising and bleeding;
- bleeding from the nose, gums;
- blood in urine and stool;
- heavy menstrual bleeding;
- severe intracranial bleeding in infants^[1].

For healthy people, there are no known risks associated with high doses of vitamin K1 (phylloquinone) or vitamin K2 (menaquinone).

Interaction with drugs

Vitamin K can have serious and potentially dangerous interactions with anticoagulants such as **warfarin**, as well as **phenprocoumon**, **acenocoumarol**, and **thioclomarol**, which are commonly used in some European countries. These drugs interfere with the activity of vitamin K, leading to the depletion of vitamin K clotting factors.

Antibiotics can destroy vitamin K-producing bacteria in the gut, potentially lowering vitamin K levels.

sequestrants , which are used to lower cholesterol levels by preventing bile acid reabsorption , may also reduce the absorption of vitamin K and other fat-soluble vitamins, although the clinical significance of this effect is not clear. A similar effect may have drugs for weight loss, which inhibit the absorption of fat, respectively, and fat-soluble vitamins ^[4].

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Vitamin K - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of vitamin K and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The

best natural sources of vitamin K are indicated . The use of vitamin a in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of vitamin K on the human body under certain medical conditions and diseases are analyzed separately.