

Journal of Healthy Nutrition and Dietetics



In issue:



Cherry



Peas



Sweet cherry



Strawberry



Beet



Raspberry

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



B vitamins

Top foods rich in B vitamins, why the body needs them, daily requirement, signs of deficiency and excess

Table of contents

<i>Tarantul A., Eliseeva T. Vishnia (Prúnus subg. Cérasus)</i>	2
<i>Tarantul A., Eliseeva T. Gorokh (Pisum)</i>	14
<i>Yampolsky A., Eliseeva T. Chereshnya (Prúnus ávium)</i>	26
<i>Tarantul A., Eliseeva T. Klubnika (Fragária)</i>	38
<i>Tkacheva N., Eliseeva T. Svekla (Beta vulgaris)</i>	51
<i>Yampolsky A., Eliseeva T. M alina (Rúbus idáeus)</i>	61
<i>Mironenko A., Eliseeva T. B group vitamins B - description, benefits, effects on the body and the best sources</i>	74



Cherry (lat. *Prúnus subg . Cerasus*)

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

Keywords: cherry, useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

100 g of fresh cherries contain [1]:					
Main substances:	G	Minerals:	mg	Vitamins:	mg
Water	86.13	Potassium	173	Vitamin C	ten
Carbohydrates	12.18	Calcium	16	Vitamin PP	0.400
Sugar	8.49	Phosphorus	fifteen	Vitamin A	0.385
Alimentary fiber	1.6	Magnesium	9	Vitamin E	0.07
Squirrels	1.00	Sodium	3	Vitamin B6	0.044
Fats	0.30	Iron	0.32	Vitamin B2	0.040
calories	50kcal	Zinc	0.10	Vitamin B1	0.030

The chemical composition of cherries largely depends on the variety, the composition of the soil and the climate in which it grows. However, in any case, fresh and dried fruits bring the greatest benefit to the body . Despite the fact that they cannot be defined as champions in terms of the content of one or another useful element, they more or less evenly present a wide range of vitamins and minerals.

Interestingly, when drying cherries, nutrients are not only not lost, but their amount is increased. Berries do not tolerate freezing so well - some of the nutrients are still destroyed.

It is better to dry cherries without adding sugar, otherwise their calorie content increases. Berries canned in syrup and cherry jams are also distinguished by a high sugar content and high calorie content. In addition, they contain noticeably fewer vitamins and microelements, so the harm and health benefits of cherries are determined by the way they are prepared or harvested.

Medicinal properties

Looking at the above tables, we can conclude that cherries are rich in vitamins A and C (100 g of these berries will provide 20% of the daily requirement of retinol and 12% of ascorbic acid). In addition, they contain B vitamins, as well as vitamin E and PP. Cherry is also a source of the essential amino acid tryptophan, folic acid and pectin ^[6]. Moreover, berries contain potassium, phosphorus, calcium, magnesium, iron, zinc, copper, etc. But their main trump card is the content of antioxidants.

Eating cherries can have a positive effect on the functioning of the cardiovascular system. Vitamin PP, especially in combination with ascorbic acid, reduces capillary permeability and promotes the establishment of metabolic processes in the walls of blood vessels ^[7]. In addition, coumarins (mainly oxycoumarins) are present in the chemical composition of cherries, which are involved in regulating the blood coagulation process. Their effect can be compared with the effect of anticoagulants, which prevent the formation of blood clots.

It is impossible to ignore the fact that cherries contain vitamin B9 or folic acid. More importantly, along with it, iron and vitamin C enter the body from berries. This whole complex is extremely useful for anemia.

Due to the presence in its composition of a set of organic acids, namely ascorbic, citric, malic, cherries contribute to an increase in the acidity of the stomach and are recommended for gastritis (with low acidity). And the presence of salicylic, formic and succinic acids, in turn, determine the bactericidal properties of berries.

Cherry fruits are rich in antioxidants, in particular, anthocyanins - glycosides that determine the color of the berry. This plant pigment helps the body fight inflammation and oxidative stress that damages healthy cells ^[8]. In addition, anthocyanins remove uric acid from the body and prevent its crystallization and subsequent deposition on the joints. Thus, cherries can be an assistant in the treatment of gout, or at least help ease its attacks.

The pectin substances contained in cherries, which are considered excellent natural enterosorbents, help cleanse the body, removing toxic elements from it. They also help maintain normal cholesterol levels.

The presence of potassium and magnesium in the composition of the berry ensures the removal of excess fluid from the body. Eating cherries alone, of course, will not help solve the problem of edema, but in combination with reduced salt intake and active movement, you can count on a noticeable effect.

A significant amount of copper in the composition of the fruit suggests that it has sedative properties and contributes to calming the nervous system. However, this effect is not so pronounced as to count on qualitative changes in the condition of people with serious nervous disorders.

Note that together with the fruits of cherries, one of the essential amino acids enters the body - tryptophan, from which the hormones serotonin and melatonin are synthesized. The latter is actively

involved in the regulation of circadian rhythms and has a positive effect on the duration and quality of sleep. Experiments have shown that drinking 240 ml of cherry juice daily for five days helps to eliminate sleep problems and helps people with insomnia to fall asleep ^[9].

The anti-inflammatory and antioxidant properties of flavonoids, which are part of the berry, provide rapid muscle recovery after active physical exertion ^[10]. Cherry juice helps to cope with pain and minor muscle inflammation and will be useful with regular exercise.

The use of cherries in medicine

To date, cherry fruits are not very actively used in conventional medicine, although the benefits and harms of this fruit are being studied by many scientists. But in pharmacology, **cherry gum is already being used** (a sticky mass protruding from a tree trunk in places where the bark is damaged). Due to its properties, it usually becomes a vaccine adjuvant - a substance designed to enhance the body's immune response to the introduced antigen.

In addition, it is used in drug delivery systems - to transport the drug directly to the desired organ or cells. Sometimes gum also performs a purely technical function of an emulsifier, preventing the various components of drugs from mixing. Finally, "cherry glue", which has enveloping properties, is sometimes used in the manufacture of drugs aimed at treating gastrointestinal diseases.

It is also worth noting that recently herbal diuretics are gaining popularity. Unlike chemical medicines, they help get rid of excess fluid with less loss of useful elements. Among them is **a decoction of cherry stalks**. It is available in the form of biologically active food supplements and has a mild effect on the body. Pharmaceutical companies involved in the development of such drugs claim that, due to the presence of potassium and flavonoids in the composition of cherries, the supplement helps fight inflammation of the urinary tract.

Finally, given that cherries have a strong pleasant smell, natural flavoring is widely used to improve the taste and smell of medicines (lozenges, tablets, potions, syrups, powders, etc.)

Cherry in folk medicine

Since cherry is a very common and affordable product with a lot of useful substances, it is often used in traditional medicine recipes. From the fruits and other parts of the plant (gum, leaves, stalks, twigs) prepare infusions, decoctions, potions, make compresses and baths. However, you should not get involved in self-medication and if you have health problems, you should definitely consult a doctor. With the approval of a doctor, cherries can be a good addition to medical treatment, but not a replacement.

By themselves, fresh berries are considered a mild laxative. They help to solve the problem of constipation that occurs with a person's low mobility. Cherry is also an effective assistant in the fight against bad breath. It should be clarified that the fruit will not solve the health problems that result in bad breath. But in cases where you have eaten a product that releases sulfur compounds when digested (for example, garlic), cherries will help neutralize the "aroma".

There are many folk recipes that contribute to the fight against hypertension. So, according to one of them, it is necessary to grind in a blender or mince 200 g of fresh pitted cherries, 2 cloves of garlic and 1 tablespoon of honey. Take this mixture one tablespoon daily before breakfast.

As for fresh cherry juice, folk healers recommend using it for epilepsy and some mental illnesses. The drink has a sedative effect due to the copper it contains. It also has a positive effect on the digestive

system, improving appetite. Moreover, it is believed that the juice is able to fight dysentery pathogens and will be effective in fever and bronchitis (as an expectorant). Finally, the combination of cherry and watermelon juice prevents the formation of kidney stones. Usually drink one glass after each meal.

Cherry gum, or simply wood "glue", wraps well and is therefore recommended for the treatment of inflammation of the mucous membranes of the intestines and stomach. Traditional healers claim that its regular use reduces and normalizes the acidity of the stomach, thereby helping to get rid of heartburn and pain attacks in the right side. In addition, gum promotes the rapid healing of unexploded calluses. After a warm bath, rinse your feet with cool water, apply fresh "glue" to the sore spot and secure with a band-aid.

Finally, cherry tree leaves are considered a good remedy for stopping nosebleeds and speeding up wound healing. Traditional healers recommend dipping cotton swabs or dressings in gruel from crushed fresh leaves.

Decoctions

For colds accompanied by a sore throat, folk healers advise putting 500 g of fresh cherries in 500 ml of dry red wine and boil for 10 minutes. At the end, add some sugar. You need to take a drink for half a glass 3-4 times during the day. Also, cherries can be used as an antipyretic for colds in children. You should take 100 g of dried fruits, pour them with 500 ml of water and keep on low heat until about a third of the volume of liquid has evaporated. When drinking, the drink should be warm.

In addition to the berries themselves, leaves are often used to make decoctions. For example, in case of liver diseases, it is recommended to take 10 g of crushed leaves, add 1 glass of milk and boil over low heat for 30 minutes. Then the broth is filtered and taken 100 ml three times a day. Note that before cooking, the leaves must be thoroughly washed.

Cherry twigs are considered very useful in folk medicine. They should also be thoroughly washed, pour hot water, bring to a boil and boil for 5 minutes. The resulting liquid must be filtered through cheesecloth and allowed to cool. Such a decoction is usually drunk for indigestion and colic in a glass 3-4 times a day. You can also add a little milk to it and wipe your feet with it every morning and evening. According to folk doctors, such a procedure will help relieve fatigue and make the skin of the legs soft.

Another ingredient often used in folk medicine is cherry stalks. They are offered to treat inflamed joints (arthritis, gout, rheumatism), as well as use them for urolithiasis and edema as a diuretic. As a rule, a decoction is prepared at the rate of 40 g of stalks per 1 liter of water. Washed cherry "tails" are poured with water and boiled over low heat for 10 minutes. Then the broth is filtered and cooled. It should be taken half a glass 3 times a day before meals. Also, this drug can rub the joints at night.

infusions

Infusions from fruits, leaves, stalks and twigs of cherries are recommended for use in colic, indigestion, high fever, bronchitis and heart disease. In case of problems with the gastrointestinal tract, they usually take about 10 leaves, wash them and pour 500 ml of boiling water. Liquids are allowed to brew under the lid for about 30 minutes. After straining through gauze and cooling, the infusions are drunk half a cup 4 times a day.

In order to bring down the temperature, it is proposed to pour 300 g of fresh pitted berries with boiling water, let them brew under the lid for 30 minutes and drink the antipyretic drug while warm. In chronic bronchitis, 1 teaspoon of chopped stalks is poured with one glass of boiling water and allowed to brew

a little. You need to drink 3-4 times a day. You can also take about 10 cherry branches up to 10 cm long, pour 1 liter of water over them, boil for 5 minutes and let it brew for about half an hour. Drink several times a day, adding honey.

To prepare an infusion for pain in the heart, you should take dried cherries, add dried hawthorn or wild rose fruits to them, pour boiling water and leave to infuse under the lid for 40 minutes. Take half a glass three times a day before meals.

Cherry in oriental medicine

Already in ancient times, cherries in the east were used not only as a food product, but also as a remedy. For example, it was believed that it lowers blood pressure, treats nausea, calms the boil of bile, strengthens the liver and stomach. The crushed bones, together with the wick, were inserted into the opening of the penis to heal the urinary tract. And the monks used cherries to crush stones in the bladder. Cherry juice mixed with wine was considered a good helper in the fight against cough.

Cherry was also used as a cosmetic product. For example, it was believed that applying cherry juice to the face would help whiten the skin and smooth out wrinkles. In addition, the berries were used to treat various women's problems, improve lactation and with heavy menstruation.

In Chinese folk medicine, this berry is still considered a means of storing internal energy " qi ". In addition, it is used externally in the treatment of skin diseases and wounds. It is also used for rheumatic inflammations.

In order to cleanse the body, warm the stomach and stop bleeding, Chinese folk healers use the leaves, twigs and even the roots of the plant. However, they warn against excessive consumption of this fruit, as it can lead to an imbalance in the yin and yang energies in the body.

Cherry in scientific research

It has long been noted that, due to its chemical composition (a rich and varied set of vitamins and a large number of trace elements), cherry fruits and other parts of this plant have a beneficial effect on various human systems and organs. However, researchers are seeking to obtain more detailed information about the properties of this berry and its ability to fight certain diseases.

So, American scientists confirmed the assumption that cherry juice improves the quality and duration of sleep. According to their experience, people suffering from insomnia can get rid of this problem by making it a habit to drink 2 glasses of fresh cherry juice a few hours before bedtime. According to them, the duration of sleep increases by an average of 90 minutes. The mechanism of action is explained by the presence in the composition of cherries of chemical compounds of proanthocyanidins, which slow down the breakdown of tryptophan, which, in turn, is involved in the synthesis of melatonin, the sleep hormone ^[11].

Cherry juice has also been found to affect blood pressure. In one study on this topic, two hours after drinking a 300 ml fruit drink, subjects with a tendency to hypertension markedly reduced both their systolic (upper) and diastolic (lower) pressure readings. After 6 hours, the condition completely returned to normal ^[12].

Scientists place special emphasis on the fact that in order to achieve the desired effect, it is necessary to strictly observe the dose and time. So, if the participants in the experiment took the same 300 ml of juice, but in portions of 100 ml for three hours, then there were no significant changes in their blood

pressure. Thus, we can conclude that the necessary processes are launched in the body only after the simultaneous assimilation of a certain dose of juice ^[12].

If we are not talking about a local way to deal with pressure surges, but about the treatment of hypertension, then in another experiment, the researchers managed to achieve a long-term normalization of the test subjects' pressure indicators after drinking 480 ml of cherry juice daily for 12 weeks. Moreover, they had a decrease in cholesterol levels ^[15].

Recent studies by Russian scientists have shown another possible use for cherry gum. In addition to being used as a vaccine adjuvant and emulsifier, it can also be used as an independent wound healing drug. So, it was found that, thanks to the polymer of galactose and arabinose in its composition, cherry "glue" provides an antibacterial effect. After conducting an experiment on mice, the scientists concluded that gum powder is most effective at the initial stage of the wound process. It eliminates microbes from cells, does not irritate neighboring tissues, and speeds up the healing process ^[13].

According to recent research by scientists from the United States, the fruits themselves are high in antioxidants, which makes it possible to combat oxidative stress, reducing the risk of destruction of healthy cells in the body. It also helps to regulate the level of triglycerides (substances that accumulate in adipose tissue cells) in the blood. It is known that these lipids are the energy resource of the body, but uncontrolled consumption of fatty foods, in particular fast food, leads to their excessive accumulation in the vessels and, as a result, the development of atherosclerosis and other cardiovascular diseases ^[14].

A study showed that eating cherries in combination with a 30-minute exercise shortly before eating a fatty meal reduces the risk of excessive accumulation of triglycerides, due to the increase in antioxidant activity of the body ^[14].

In addition, the beneficial properties of cherries are attracting the attention of scientists looking for an alternative to remedies that prevent bone damage in rheumatoid arthritis. Existing drugs have serious side effects and cannot be used on a permanent basis. Studies in mice have shown that cherry-based preparations may be of benefit as a prophylactic in chronic rheumatoid inflammation ^[16].

Finally, several recent studies have demonstrated the benefits of cherries for athletes. The anti-inflammatory and antioxidant properties allow athletes to train longer and harder, as well as speed up the recovery process. In one experiment, professional runners consumed 710 ml of cherry juice daily a week before and a few days after participating in a marathon. It was noted that they experienced less muscle pain and their recovery was faster compared to the placebo group of runners ^[17].

Cherry Weight regulation

Cherry is considered a product that promotes weight loss. This is partly true, because fresh fruits contain a low amount of calories - only 50 kcal per 100 g. Although you should be aware that eating cherries alone will not lead to magical results. To get the effect, you must also introduce other healthy foods into the diet and play sports.

However, cherries can be a good weight loss aid because they are not only low in calories but also rich in dietary fiber. They slow down digestion and saturate a person for a longer time. Thus, berries can be a good alternative to a snack consisting of sandwiches or sweets.

In addition, cherries have a low glycemic index and do not provoke a sharp increase in sugar levels in the body. By the way, according to a study conducted by American scientists in 2014, diets that

include foods with a low glycemic index lead to greater weight loss than diets that include foods that are low in fat ^[19].

By the way, nutritionists especially recommend eating cherries if you often eat fast food or any other fatty foods. Berries help to reduce the rate of accumulation of fats, in particular triglycerides, reduce the risk of developing cardiovascular disease and type 2 diabetes ^[18].

Cherry in cooking

Cherry is a common and affordable fruit, so it can be found in almost any cuisine in the world. This berry is especially loved in Ukraine, where dumplings with cherries are considered one of the traditional national dishes. In general, jams, jams, sauces are prepared from cherries, they are added as a filling to cakes and pies, duck is stuffed with them, they are used to make compotes, jelly, smoothies, cocktails, liqueurs (portuguese ginjinha), liqueurs. Interestingly, the leaves of the plant are added to cucumbers during preservation to give them crunchiness.

An unusual use for cherries was found in Japan. Firstly, they sell chips with the taste of this berry, and, secondly, ice cream with an extraordinary combination of tomato and cherry is popular. By the way, if we talk about combining this fruit with other products, then strawberries, raspberries, citrus fruits, bananas, nectarines, chocolate, vanilla, cinnamon, hazelnuts and almonds are well suited. From drinks, cherries are combined with cognac, wine, vermouth. You can add this berry to fermented milk products and cheeses.

For example, it is very appropriate in a summer cottage cheese jelly cake, which is easy to prepare and does not require baking. To prepare it you will need:

- 500 g cherries;
- 500 g sour cream;
- 500 g of cottage cheese;
- 500 g of sugar;
- 100 g of oil;
- 200 g of ordinary cookies;
- 50 g of gelatin;
- 1 pack of cherry jelly.

Crushed cookies must be mixed with melted butter and, having formed a cake, put it on the bottom of the mold. Then you need to beat cottage cheese, sour cream and sugar, add gelatin and beat everything again until a homogeneous mass is obtained. Half of the cherries should be pitted, ground to a puree and poured into the already prepared cream. Pour the resulting mixture into the cake and put in the refrigerator until it hardens. Put the remaining cherries on the cake and fill the top with cooked jelly. Put the cake back in the fridge until it hardens.

By the way, for quick pitting of cherries, you can use special machines or manual devices. They make the process much easier and faster. If, for cooking or decorating a dish, you need to cut already peeled cherries in half, then you can resort to the life hack used for slicing cherry tomatoes. True, it should be borne in mind that this method will only work if you have large enough and not overripe fruits. So, the berries are laid out tightly on a flat plate or plank, covered with something equally flat on top and, holding the top with a hand, pass between them with a sharp knife, thus cutting them into two halves.

Finally, it should be noted that cherries are among the top ten fruits and vegetables most susceptible to pesticide contamination. In order to clean the fruit, it is recommended to mix 1 tablespoon of lemon

juice, 1 tablespoon of vinegar and 1 glass of water. In this solution, the cherries should lie down for 10 minutes, and then they should be washed with running water.

What kind of drinks do not add cherries. These are hot punch, mulled wine, tea, and cooling smoothies, juices, compotes, and various alcoholic cocktails. In our opinion, the recipe for winter berry tea deserves special attention. To prepare it, you need to knead a handful of thawed cherries with mint and honey, add 500 ml of hibiscus and lemon. Among summer drinks, a refreshing smoothie stands out. To prepare it, you need to grind a glass of mint leaves, 200 g strawberries, 200 g cherries, 2 bananas in a blender and add 1 glass of water.

Cherry in cosmetology

Not so long ago, Chinese scientists conducted an experiment that demonstrated the effectiveness of an extract of cherry blossom petals in the fight against skin inflammations of various etiologies. Probably not far off the appearance of appropriate cosmetics. As for already existing cosmetics, it is worth paying attention to natural cherry seed oil.

It is extracted from crushed raw materials by cold pressing. Heating, refining or any other additional purification deprives the oil of unsaponifiable fractions - biologically active substances that promote skin regeneration. Therefore, you need to carefully read the labels when purchasing the product and pay attention to the method of extraction.

The oil is based on oleic, stearic, linolenic and palmitic acids, as well as antioxidants, tocopherols, vitamins E and A. Due to the presence of rare eleostearic acid, this remedy is considered one of the best natural protectors from ultraviolet rays. It can be used not only on the face, but also for the care of the skin of the whole body, as well as on the lips and around the eyes. Its texture is light and absorbs quickly.

Creating an invisible protective layer on the skin, the oil not only protects it from the sun, but also prevents the evaporation of moisture, balancing the hydrolipidic balance. Also, the product has a light nourishing effect, promotes collagen synthesis and maintains the structure of the skin. With systemic use, it can even be classified as anti-aging cosmetics.

There is also a huge variety of folk recipes for cosmetics based on cherries. Most of them are face masks. Among the most popular are the following:

- cherry-honey (5 ripe berries + 1 teaspoon of liquid honey) - for dry skin type;
- cherry-egg (5 ripe berries + 1 egg yolk) - for oily skin type;
- cherry sour cream (5 ripe berries + 1 teaspoon of sour cream) - for normal skin type.

Dangerous properties of cherries and contraindications

Cherry contains many useful elements and, in general, has a beneficial effect on the body. However, at the same time, this fruit is rich in organic acids, so it should be consumed carefully and not in too large portions (no more than a glass at a time). In this case, only the dosage separates the benefits and harms. Also, it is better to completely refuse the use of cherries when:

- susceptibility to allergies or hay fever (seasonal allergic reaction to plant pollen);
- exacerbation of stomach ulcers;
- gastritis with high acidity;
- cystitis;
- chronic lung diseases.

In addition, it is not recommended to eat cherries on an empty stomach, as this can lead to irritation of the gastric mucosa. You should also rinse your mouth after eating berries and fresh cherry juice, as they can erode tooth enamel. Finally, you should be careful about cherry pits, which, when swallowed, release hydrocyanic acid and can have a toxic effect on the body. True, if you accidentally swallowed one nucleolus, you should not worry, the lethal dose is about 50 seeds.

Despite some contraindications, if consumed in moderation, cherries bring invaluable benefits to the body: they start regeneration processes, strengthen the nervous and cardiovascular systems, lower cholesterol levels and prevent many diseases.

How to choose and store cherries

Fresh cherries should be resilient, but not hard - when pressed lightly, there should be a feeling that the berry may crack. Fruits must be with petioles, otherwise, due to tearing of the skin, they begin to lose juice and quickly deteriorate. The saturation of the color of the fruit does not always indicate their ripeness, but may indicate belonging to one or another variety (some cherries, even when ripe, remain scarlet without acquiring a burgundy hue). Cherries are usually stored in the refrigerator. Unripe fruits can lie for up to ten days, and mature ones for about five.

If we talk about harvesting cherries for the winter, then traditionally jams are made from it and jams are made. However, heat treatment deprives the berries of most of the vitamins, and the sugar used by all means significantly adds calories. In addition, if you preserve cherries with pits, then they must be eaten within a year, otherwise poisonous hydrocyanic acid begins to form. But the cherry retains all its beneficial properties when dried. You can store such a product in the refrigerator and this is one of the best ways to winter harvest.

You can also freeze berries. Although the amount of vitamins, especially vitamin C, will decrease slightly, cherries will still be beneficial in the cold season. It is recommended to freeze fruits immediately after picking. If you buy berries in supermarkets, it is advisable to ensure that there are as few pieces of ice in the package as possible, and that the fruits are free from rot. By the way, recently shock freezing has become more and more popular, when the product is placed in a vacuum package and subjected to such low temperatures that instead of the usual 2-3 hours, it freezes in 30 minutes and loses less useful substances.

Interesting Facts

Cherry trees grow in almost all corners of the world and attract not only the opportunity to harvest tasty and healthy fruits, but also the opportunity to enjoy the extraordinary beauty of plants during their flowering period. In Asian countries, for example, in addition to ordinary cherries, a large number of ornamental plants called sakura grow. At the end of March - at the beginning of April, they turn the cities into a white-and-pink flowering splendor, which attracts millions of tourists to admire.

By the way, in Japan there is even a special expression “o-hanami”, which refers to the tradition of admiring cherry blossoms. Recently, more and more decorative cherry trees appear in other countries of the world. For example, in Copenhagen, Prague, New York, there are already large parks almost completely planted with these trees.

Cherry came to us from Byzantium back in the 11th century. And already in the XII century. Yuri Dolgoruky founded the first gardens in the Moscow region. In the XVIII-XIX centuries. the first industrial gardens began to appear in the Russian Empire.

By the way, at the beginning of the twentieth century. the play of A.P. Chekhov "The Cherry Orchard", in which the cherry tree plays a plot-forming role. In addition, the famous children's writer J. Rodari in The Adventures of Cipollino depicted two countesses in the form of cherries, giving them the appropriate names - Countess Cherry, and called their young nephew Count Cherry.

In 2007, in Russia, in the village of Bolshiye Bakaldy , a museum dedicated to cherries was opened. It has been here since the 17th century. grow and process these berries. And in the city of Glubokoe, in Belarus, a festival dedicated to this fruit has been held since 2013. In the same place, a monument was erected to the cherry tree and a large garden of 1414 trees was laid (the year the city was founded). The cherry blossom festival is held annually in April in South Korea. As for the monuments, they can be found not only in Belarus, but also in Russia (Vladimir), and even in the USA (Minneapolis).

Interestingly, in English, cherries and sweet cherries have the same name " cherry ". And for clarification, they usually use words that describe the taste of fruits: “ sour ” (sour - refers to cherries) and “ sweet ” (sweet - refers to cherries).

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Cherry - useful properties, composition and contraindications

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Peas (lat. Pisum)

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

Keywords: peas, useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

100 g of fresh green peas contains [1]:					
Main substances:	G	Minerals:	mg	Vitamins:	mg
Water	78.86	Potassium	244	Vitamin C	40.0
Carbohydrates	14.45	Phosphorus	108	Vitamin PP	2.090
Alimentary fiber	5.7	Magnesium	33	Vitamin B1	0.266
Sugar	5.67	Calcium	25	Vitamin A	0.230
Squirrels	5.42	Sodium	5	Vitamin B6	0.169
Fats	0.4	Iron	1.47	Vitamin B2	0.132
calories	81kcal	Zinc	1.24	Vitamin E	0.13

From the above tables it follows that fresh peas bring the most benefits to the body. Both the peas themselves and the pods (suitable for consumption) contain a large amount of vitamins and minerals. In addition, this vegetable is not dangerous for those who want to lose weight - it has a low calorie content.

As for the different ways of processing green peas, they affect its nutritional value in different ways. So, freezing only partially deprives the product of nutrients and vitamins, but after conservation, a negligible amount of useful substances remains in the vegetable. Dry yellow peas, in turn, are not very rich in vitamins, but boast an extremely high content of protein and dietary fiber.

Medicinal properties of peas

Peas are one of the richest sources of vegetable protein needed by the body as a building material for muscles and bones. It also provides a long-lasting feeling of satiety, because, together with dietary fiber, it slows down the digestive process and raises the level of hormones that reduce appetite ^[6]. In terms of protein content, peas are often compared with meat, and often this vegetable becomes an integral part of the diet of vegetarians and vegans .

However, no matter how similar proteins of plant and animal origin are, they are still not identical, so peas cannot become a full-fledged meat substitute. By consuming this vegetable, the body does not receive the essential amino acid methionine, which is involved in a large number of biochemical processes. For example, 100 g of peas contains only 0.082 g of methionine, and 100 g of beef contains 0.588 g.

On the other hand, scientists came to the conclusion that a high content of methionine and its derivative, homocysteine , in the body leads to problems with blood vessels, thrombosis , and activation of genes that provoke aging. It is best to keep a balance and keep methionine in the area of the minimum norm. This can be achieved by reducing meat consumption and adding other sources of protein, such as peas, to the diet.

Also, fresh green peas provide the body with a real vitamin charge. The vegetable is distinguished by a high concentration of B vitamins, and also contains vitamins C, PP, E, A , K. In addition, peas are rich in trace elements such as: potassium, magnesium, phosphorus, iron, zinc, selenium. All these vitamins and nutrients often play a key role in many processes in the body, and their deficiency can lead to serious diseases.

Note that along with peas, a number of valuable acids enter the body. For example, glutamine is an essential element for the functioning of the brain. This neurotransmitter amino acid is actively involved in the metabolism in brain tissues. Indispensable in the metabolic processes of the body and pantothenic acid. It also provides the synthesis of cholesterol, hemoglobin, histamine. Finally, it is difficult to overestimate the importance of folic acid, which is involved in the formation of red blood cells and contributes to the normalization of hematopoiesis.

The positive effect of peas on the digestive system is associated with the presence of dietary fiber in its composition. They act as natural probiotics, keeping beneficial bacteria alive and preventing pathogens from multiplying in the gut. This helps to prevent various gastroenterological problems and even colon cancer ^[7]. Fiber also helps with constipation. And it also provokes the production of an element in saliva that is responsible for the fight against plaque.

Note that the use of peas has a beneficial effect on the human cardiovascular system. The high content of potassium, magnesium and calcium helps to maintain normal blood pressure. Dietary fiber contributes to the normalization of cholesterol levels, and accordingly reduces the risk of atherosclerosis. In addition, antioxidants, together with vitamins A and E, protect cells from destruction and thereby contribute to the fight against cardiovascular diseases, while simultaneously preventing cancer. ^[8].

It is recommended to use peas for diabetes. Firstly, this vegetable has a low glycemic index - a measure of how quickly blood sugar rises after eating the product. Fiber reduces the rate of absorption of carbohydrates, which leads to a gradual, rather than rapid rise in its level ^[9]. Moreover, studies show that due to their high protein content, peas help stabilize blood sugar in type 2 diabetics ^[10].

Nevertheless, despite the mass of useful properties, many continue to be ambivalent about peas, since it is one of the leaders among products that cause bloating and flatulence. The thing is that this vegetable is not completely absorbed in the small intestine and enters the large intestine, where the bacteria living there attack it. The combination of these microorganisms with simple sugars contained in peas leads to fermentation and gas formation. Contrary to popular belief, these gases are absorbed in such minimal quantities that they do not cause any harm to the body, but they still create certain inconveniences.

However, there are several ways to get rid of the discomfort. First, you can pair peas with foods like dill, turmeric, and mint. They contribute to the crushing of gases into small bubbles, reducing bloating. Secondly, eating sprouted or soaked peas can help. This preparation promotes the production of additional enzymes that speed up the digestion process. Finally, including peas in the diet on a regular basis allows the body to get used to it and begin to produce more amylase, which breaks down sugar, and thus prevents the fermentation process.

The use of peas in medicine

To date, this legume is not yet used in the manufacture of medicines, but it has a good potential to be involved in the pharmaceutical industry. For example, Japanese scientists believe that peas have immunomodulatory properties and can become one of the components of immunostimulating agents. In addition, for therapeutic purposes, it can be used in preparations to normalize the intestinal microflora.

It should also be noted that pea protein is used in sports and dietary nutrition from the grains of sowing peas. It stimulates the growth of muscle tissue and, unlike animal protein, puts less strain on the kidneys.

The use of peas in traditional medicine

In folk medicine, various remedies are prepared on the basis of peas, but it is not recommended to use them as the main medicine. Such natural preparations can be an adjunct to therapy or, in some cases, prevention. It is also necessary to consult with your doctor about their use.

The balance of vitamin and mineral complexes make peas a valuable dietary vegetable for nephrolithiasis. The vegetable has a diuretic effect and removes salt from the body, preventing the formation of stones. In addition, it can help break up existing stones into smaller pieces for easier removal from the body. For this purpose, folk doctors recommend making a decoction of young shoots of peas. Some advise adding the leaves of the plant and the beans themselves to it.

Shoots are collected during the flowering period, washed, crushed and poured with water (at the rate of 2 tablespoons per 1 glass of water). Bringing to a boil, leave the stems on low heat for 10 minutes. Then the broth should be allowed to brew for about 30 minutes and strain it. In order for the remedy to produce the desired effect, it is necessary to take a decoction for about one month. Usually it is drunk 2 tablespoons 3-4 times a day before meals.

For skin diseases such as eczema and erysipelas, as well as for purulent wounds, traditional healers advise using peas externally. To do this, you can mix a few tablespoons of pea flour with the protein of a raw chicken egg and mix until smooth, apply to the affected area of the skin. Another option: mix egg white with unripe peas mashed into a pulp.

Also, peas are considered a good helper in the fight against boils and carbuncles. For the treatment of such purulent-inflammatory diseases, poultices are made from pea flour. They provide accelerated maturation and softening of damaged skin segments. By the way, you can make your own flour at home. Dry grains of peas need to be crushed and brewed with boiling water in a ratio of one to one. Stir the mixture, cool it to avoid burns and apply it warm to the sore spot, covering it with paper and bandages. Leave for a few hours.

In addition, pea flour is recommended for digestive problems (especially constipation), high cholesterol (as a prevention of atherosclerosis) and high sugar levels. Also, traditional healers believe that pea flour helps restore normal blood circulation in the brain, which, in turn, leads to a decrease in headaches and an improvement in memory. For such purposes, usually take 1 teaspoon of flour on an empty stomach daily.

The use of peas in oriental medicine

In the East, peas have been known since very ancient times. For example, references to it are found in the ancient Indian Vedas. According to legend, this legume was given to people by the gods when the earth stopped producing crops. Legendary ruler and incarnation of God on earth, Prithu Maharaj, knew how to communicate with Devas - demigods who control energies, stars, elements. To save people from hunger, they advised the ruler to plant legumes, which, during growth, accumulate the energy of the sun and then transfer it to people.

In ancient China, peas were a symbol of wealth and prosperity. There it is referred to as neutral products that affect the body gently and soothingly. Chinese folk doctors believe that this vegetable stimulates the spleen, improves digestion, fights constipation, has a mild diuretic effect and, as a result, reduces swelling. In general, peas are considered a healthy product that tones and strengthens the body.

In the Tibetan classical medical treatises, peas were suggested to treat skin diseases. For this, the affected areas were advised to rub with pea flour. It was also believed that such procedures improved blood circulation and helped with indigestion.

Peas in scientific research

Scientists from the University of Copenhagen have found that vegetable protein saturates the human body better than animal protein. The experiment involved 43 young males who were served three meals of either vegetable protein rich foods (mainly peas) or animal protein foods (mainly pork, venison and beef). As a result, it turned out that those who received legumes were satiated better and consumed an average of 12% fewer calories at the next meal than those who ate meat ^[11].

Scientists attribute this to the high fiber content of peas. Although legumes are less saturated with protein than meat, they create a feeling of fullness due to the coarse dietary fiber in their composition ^[11]. The results of the experiment were important in terms of including peas in the diet.

The following studies were not long in coming. So, taking the results of previous experiments as a basis, Canadian scientists continued to develop this topic. In their experiment, 940 people (men and women) took part, who received 130 g of peas per day for 6 weeks. At the same time, they did not limit themselves in other products and led a familiar lifestyle. As a result, even when receiving the minimum portion of peas and without effort, on average, each of the participants lost 0.34 kg during this period ^[12].

Scientists from the same research center in Toronto found out that the introduction of legumes, including peas, into the diet helps to reduce cholesterol levels by 5%. According to the researchers, daily consumption of these products by 5-6% would reduce the risk of developing cardiovascular diseases, which today are considered one of the main causes of death. Note that a more marked reduction in cholesterol was seen in men, since, as a rule, they monitor their diet less and their initial indicators are worse than in women ^[13].

Japanese scientists, in turn, believe that peas can be used to solve problems with the gastrointestinal tract. After a series of experiments on mice, they came to the conclusion that the effect of the vegetable is similar to probiotics: it significantly improves the functions of the mucous membranes, raises local immunity and prevents the vital activity of pathogenic microorganisms. However, according to the researchers, the problem is that to achieve the desired result, peas need to be eaten in huge quantities, so now they are studying the mechanism of its action and will soon try to synthesize the necessary substance ^[14].

Among other things, peas have proven effective in treating hypertension and relieving symptoms of chronic kidney disease. Often these two diseases are connected in a vicious circle: high blood pressure negatively affects the functioning of the kidneys, and kidney failure keeps the pressure at a high level. However, when consuming pea protein, it is possible to delay or even prevent the development of kidney failure. If the disease has already developed, then pea protein will at least maintain the pressure at a normal level, reducing the burden on the kidneys ^[15].

The researchers conducted an experiment on rats in which half of the rodents with polycystic kidney disease were given pea protein hydrolyzate (the protein is partially broken down and purified by enzymes, after which only the most essential amino acids remain), and the other half did not change their usual diet. As a result, a 20% drop in blood pressure was noted in animals on a protein diet. These results are encouraging, as the majority of deaths in patients with renal insufficiency are complications caused by high blood pressure ^[15].

Peas for weight loss

So far, nutritionists have not been able to give an unambiguous assessment of peas. This is undoubtedly a very useful product, but its inclusion in the diet when losing weight is an issue that leaves room for discussion. For example, in the lifting diet of the famous Hollywood doctor Nicholas Perricone, peas are in the category of forbidden vegetables, but the famous Canadian nutritionist Russell de Souza claims that daily consumption of this legume helps to lose extra pounds without much effort.

Well, first you need to figure out what kind of peas we are talking about. Since when permitting or prohibiting the use of a particular product, several parameters are taken into account and they are different for peas, depending on the methods of its preparation. First, you need to look at the calorie content. From this point of view, fresh green peas are absolutely suitable for any diet. It contains a lot of nutrients and vitamins and only about 80 kcal per 100 g. The situation is completely different with dry peas, whose energy value reaches 350 kcal per 100 g.

However, this is not all. Controversy arises when considering the second parameter - **the glycemic index of the product** (an indicator of the influence of carbohydrates on changes in blood sugar levels). So, for fresh peas it is 50 units, and for dry peas it is 25. That is, fresh peas immediately give off energy and the glucose level in the body rises faster and, accordingly, a feeling of hunger arises much faster. But when eating dry peas, which also contain a lot of protein and fiber (due to which it is digested more slowly), the feeling of satiety remains for a longer period of time.

So, if the diet involves the rejection of meat, then dry peas can make up for the protein deficiency. In addition, it will provide the necessary energy and strength during physical exertion. Moreover, the results of some studies show us that with the regular intake of small portions of dry grains, a person loses excess weight. This is mainly due to the fact that after a dish of peas you do not want to eat for a longer time. In addition, this vegetable helps to improve the functioning of the digestive tract, which is also important for normalizing weight. If the calorie content of peas is still too high for you, then you can include in your diet much more "light" fresh green peas.

Finally, if you already have enough protein in your diet, then eating peas may really be worth giving up. Since a large amount of protein creates a strong burden on the kidneys. Also, a protein diet is contraindicated for those who are trying to lose weight solely through changes in diet, without physical exertion. In this case, the accumulating protein will gradually turn into glucose and only provoke weight gain.

Peas in cooking

Peas are loved and have long been used in almost all countries of the world. It is known that it was popular among ancient Greek commoners. In Russia, since the Middle Ages, many different dishes have been made from peas, but in those days it was also eaten mainly by the poor. But in France, fresh green peas were served in rich houses as a delicacy, and dry beans were the lot of ordinary people.

Today, peas are by no means considered a second-class food. For example, in Holland, one of the best restaurants in Amsterdam, which is located near the Royal Palace, prepares a signature dish - pea soup with smoked meats. In some peoples (for example, in Latin America), this legume generally forms the basis of the plant menu. In the Middle East, by the way, the so-called "mutton peas" or chickpeas are widespread. However, this is not a special variety of peas, but its close relative - a legume belonging to a different genus.

In cooking, peas are used in different ways: they are eaten fresh, added to meat dishes, salads, canned, soups, cereals, mashed potatoes, meatballs are made from it, it is used as a filling for vegetarian dumplings, pies and pancakes. And in China, they even came up with the idea of adding peas to ice cream.

Interestingly, in summer it is customary for us to eat fresh green peas separately from everything else, although they can fit perfectly into any vegetable salad. For example, it works well if you add it to tomatoes, red onions, tofu cheese and chili peppers (or garlic). You can dress this salad with olive oil.

Another interesting point: we are used to preparing pea soup from dry grains, but there is also a lighter summer version of this dish that uses a young vegetable. The recipe for pea soup is very simple. You should bring the water in the pan to a boil, throw a few mint leaves into it, throw in the peas (you can use a frozen product in the off- season) and cook for 3 minutes. During such a short-term heat treatment, useful substances will not have time to collapse. Then you need to drain the water, grind the peas and mint in a blender and pour the resulting mixture back into the broth. Add salt, pepper and olive oil.

If you prefer traditional soup or pea puree made from dry grains, then you should pay attention to a few useful life hacks . Firstly, it is advised to soak the peas before cooking - this is known to many, but not everyone knows that in the process you can add one teaspoon of baking soda to the water and this will remove the enzyme blockers that help the peas digest better and faster. Thus, it will help to partially solve the problem of bloating and flatulence.

Secondly, if you forgot or did not have time to soak the beans, then to speed up their boiling , you need to add a little cold water to the pan every 5-7 minutes. You can cook peas in a slow cooker . True, it will take more time - about an hour and a half in the "extinguishing" mode.

As for the compatibility of peas with other products, it is good to use it with fresh bell peppers, all kinds of cabbage, cucumbers, carrots, tomatoes, zucchini, eggplant and beets. Sauerkraut and cucumbers are also suitable. You should not combine peas with grains and dairy products.

The use of peas in cosmetology

Despite the fact that legumes in general and peas in particular have a lot of useful properties, cosmetics based on them are so rare that they can be counted on the fingers of one hand and basically we are talking about providing an anti-aging effect. Thus, the Latvian company ITLA.LV has released a series of creams " La Femme élégante ", which contain pea extract. Lifting creams and masks with an extract of this legume were also developed by the Spaniards (" Natura Bisse " ultra-repairing eye contour cream) and Russians ("Russian field" anti-wrinkle cream).

And although now peas are not used in the most active way in cosmetology, they used to be considered a good helper in the fight against skin diseases. According to legend, Catherine II suffered from problematic facial skin and, ashamed to show it in public, applied a layer of flour as a powder. Naturally, this only aggravated the situation and new spots and irritations appeared on the face. Then one of the court physicians advised the Empress to try a Roman pea mask. In a wooden mortar, it was necessary to crush the peas, add sour cream and apply on the face several times a week. The Empress was very pleased with the results, as her skin became white and smooth.

Although the effectiveness of "pea" cosmetics has not been scientifically confirmed, women still quite often use self-prepared products. In principle, there is common sense in this, since this vegetable has a complex of B vitamins, vitamin E and antioxidants that have a positive effect on the condition of the integument. Masks are used both to eliminate imperfections and to maintain healthy and youthful skin.

For the care of dry and normal skin types, it is recommended to use fresh green peas, which provide good hydration. To prepare the mask, it must be mashed to a puree state. As a rule, the procedure is carried out once a week. Owners of oily skin type are better suited for products made from dry peas - they dry the epidermis and fight acne. Typically, dry beans are either boiled and then mashed into a puree, or ground in a coffee grinder to a flour state. The mask must be applied 2 times a week. Keep funds on the skin should be no more than 10-15 minutes, and then rinse well with water.

Among the most popular mask recipes for dry skin, we highlight the following:

- **Berry -pea.** Two tablespoons of puree from fresh peas are mixed with two tablespoons of blackcurrants, crushed as much as possible. It is believed that such a remedy helps fight wrinkles.
- **Olive-pea.** Two tablespoons of fresh pea puree are combined with one tablespoon of olive oil, three drops of orange ether and raw egg yolk. Such a mask should have a lifting effect.
- **Pure pea.** If you just want to moisturize the skin, then it is enough to apply mashed peas on your face without adding any other ingredients.

For oily skin, the following recipes can be useful:

- **The classic mask** is designed to eliminate oily sheen. Three tablespoons of pea flour must be poured with water or milk so that a viscous mixture is obtained.
- **A cleansing mask** is prepared with 30 g flour, 30 g oatmeal, a little water, a pinch of nutmeg and cinnamon. The mask should have a peeling effect, so you need to apply it with massage movements, and then leave it on your face for 5-7 minutes.

Dangerous properties of peas and contraindications

The benefits of peas are undeniable, but at the same time, there are some contraindications to its use. For example, it is not recommended for people with gout, during an exacerbation of gastrointestinal diseases, with acute nephritis and circulatory disorders.

In addition, peas contain so-called antinutrients - compounds that interfere with the absorption of nutrients. Of all legumes, peas have the fewest antinutrients, but they are still there and, in addition to neutralizing beneficial minerals, can create digestive problems. Especially caution should be exercised by people who consume peas as their main protein food, and those who suffer from chronic malnutrition.

Among the most active antinutrients in peas are phytic acid and lectins. The former binds minerals and prevents the body from absorbing enough iron, calcium, zinc, and magnesium. And the latter contribute to increased gas formation and bloating. In order to prevent the negative impact of peas on the body and allow all useful elements to be absorbed, it is necessary:

- eat beans, especially fresh, in moderate portions (120-170 g);
- sprouting or soaking beans before cooking and eating.

How to choose and how to store peas

When buying fresh green peas, you need to pay attention to the color: the pods must be green without yellowing. In addition, they should break easily and with a crunch, releasing juice. Note that this is a perishable vegetable that quickly loses its taste and useful qualities, so it is advisable to eat it immediately after harvesting or purchasing. It is best to store in a closed container in the refrigerator for no longer than 7-10 days.

When choosing dry peas, you should look at the size of the peas: they should be medium-sized (3-4 mm in diameter). The color can be either yellow or green, but not purple, since these are already fodder varieties. When dry, this legume can be stored in plastic packaging for up to 5 years, and in a hermetically sealed container or in a vacuum - all 10. Although it is preferable to use glass containers with a little salt at the bottom - this will help repel insects and eliminate excess moisture. By the way, if you are wondering how to quickly cook pea porridge and want the peas to be easily boiled to a homogeneous mass, then you need to choose dry chopped grains.

Finally, with regard to canned peas, when choosing it, you should give preference to glass containers, which allow you to consider the quality of the product. Peas should be whole and not dented. Also, the lid on the jar should in no case be swollen. In addition, you should definitely pay attention to the composition. In a quality product there is nothing but water, sugar, salt and the peas themselves, the content of which, by the way, should not be lower than 65%. The date of manufacture also plays an important role, since from May to July, manufacturers, as a rule, use fresh raw materials, and the rest of the time they use frozen or sublimated.

Interesting facts about peas

In many cultures, the appearance of peas on earth is associated with divine providence. For example, according to one of the legends, when God expelled the sinning Adam from the garden, he had to work hard. And so, when he plowed the ground, tears rolled down his cheeks and, falling into the soil, turned into peas.

From more reliable information, it is known that in Russia peas were often planted along the roads so that distant travelers could get enough. It was also used for various rituals. For example, in order to attract good luck and wealth, they put 22 dry peas in an iron mug, covered it with their left hand and rattled the contents, going around the house in a circle. But in ancient Rome, peas were used for love spells. So, there was a belief that parts of a pea divided in half are attracted, so the girls left one half for themselves, and threw the other to their lover.

In Japan, peas have long and still symbolize good health. It is believed that it must be on the New Year's table along with noodles - a symbol of longevity and rice cookies - a symbol of abundance ^[17]. In Medieval France, in turn, peas not only became a symbol of health, but turned into a real savior of the people. The unsightly houses of ordinary people kept heat very poorly, so in cold winters, many fell ill and died.

The situation was saved by King Charles V, who brought from one of his visits to Spain an unusual new crop - peas. It turned out that one Spanish nobleman treated Charles to pea porridge with fried pork. The French monarch liked the fact that the food remained warm throughout the two-hour meal. He ordered to bring home several hundred carts with this legume. It was sown in fields in the south of the country, and from that moment on, pea porridge with bacon became a French folk dish that warmed many families in severe frosts.

But in ancient Greece, beans had an ambiguous reputation. Mostly poor people ate them, while intellectuals believed that peas dull the mind and cause insomnia. The famous mathematician and philosopher Pythagoras even forbade his students to use it. There is a legend about how the Pythagoreans, who were running away from their enemies, suddenly stopped and were completely defeated, because they did not dare to cross the field sown with beans ^[17].

Interestingly, there is a rare genetic disease Favism. It is most common in Iran, Iraq, Morocco, Italy and France. Its origin is still unclear, and the mechanism of damage to the body is not fully understood. Some of the substances contained in peas, getting into the blood, start the process of

disintegration of blood cells - erythrocytes. There is temporary paralysis. Those suffering from this disease are not recommended not only to eat peas, but also to be in places where legumes bloom.

By the way, it used to be believed that Fauvism is a disease of monarchs, which is transmitted from generation to generation. No wonder, in the famous fairy tale of Hans Christian Andersen's *The Princess and the Pea*, the prince, who wanted to marry a member of the royal family, married a beggar woman only because she could not fall asleep on the feather bed, under which lay one single pea. Since her body reacted to the bean culture, one could be sure that the girl was actually a real princess.

Continuing the theme of monarchs and peas, one cannot help but recall the well-known expressions "under Tsar Pea", "remember Tsar Pea", "when Tsar Pea fought with mushrooms". This same King Pea is a character in satirical works, where he is portrayed as a legendary ancient ruler, and playful phraseological units, which basically mean "in ancient times."

peasouper" (pea soup) that exists in English has a very serious and, unfortunately, negative meaning. So in the middle of the twentieth century in England they called the type of thick fog. After the anticyclone brought cold foggy and windless weather to London, people began to use more coal to heat their homes. This coal was of poor quality and contained sulfur. After burning it, toxic substances entered the air, which mixed with exhaust gases from vehicles and dust, forming thick smog.

The darkness that covered the capital practically paralyzed the city for several days. Due to poor visibility, transport stopped running, people tried not to go out into the streets, although smog penetrated into the premises. Because of the soot particles, which gave the fog a yellow-black color, they began to call it "pea soup". As a result, several thousand people died in London (most of all the elderly and people suffering from respiratory diseases).

Varieties and cultivation

Growing peas is not a very difficult task. He feels best on light soil, rich in potassium and phosphorus, but without nitrogen. It is best to choose a sunny area, protected from the wind. Planting time for pea seeds can vary from the 20th of April to the beginning of July (exceptionally early ripening varieties). Flowering occurs in 28-60 days, depending on the variety. A month later, the first harvest appears. Fruiting lasts an average of 30-40 days.

Note that peas can be planted both with the help of germinated grains and with the help of dry ones. However, in the latter case, it is impossible to do without presowing seed treatment. Some gardeners recommend lowering them for 5 minutes in a warm (40 ° C) solution of boric acid at the rate of 2 g per 10 liters of water. Others advise doing a full soak of the seeds in water at room temperature for 12-15 hours (water should be changed every 3 hours).

As for varieties, vegetable peas are divided into two main groups: *sugar* (brain varieties) and *shelling*. Sugar peas are more tender, can be eaten with the pods, and are usually used for canning. And shelling varieties contain more starch, their pods are unsuitable for human consumption, and the grains are usually dried.

So, peas are the most useful vegetable that provides the body with a good vitamin complex and supplies the necessary minerals. Moreover, in dry form, it, like no other product, is rich in protein and dietary fiber with a relatively low calorie content. Unlike other protein foods, peas do not cause an increase in cholesterol levels. And the regular use of its small portions will have an extremely positive effect on human health.

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Peas - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of peas 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 peas in various

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



Sweet cherry (lat. *Prúnus avium*)

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

Keywords: cherry, useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

100 g of fresh cherries contain [1]:					
Main substances:	G	Minerals:	mg	Vitamins:	mg
Water	82.25	Potassium	222	Vitamin C	7
Carbohydrates	16.01	Phosphorus	21	Vitamin PP	0.154
Sugar	12.82	Calcium	13	Vitamin B6	0.049
Alimentary fiber	2.1	Magnesium	eleven	Vitamin B2	0.033
Squirrels	1.06	Iron	0.36	Vitamin B1	0.027
Fats	0.20	Zinc	0.07	Vitamin A	0.019
calories	63kcal	Sodium	0	Vitamin E	0.07

The pulp of cherry fruits contains about 10% sugars, fiber, hemicellulose, various organic acids, pectins, vitamins of groups B, PP, C, biotin, iron salts, flavonoid glycosides, essential oils, coumarins, amygdalin. Depending on the cherry variety and the conditions of its ripening, the chemical composition of the product varies, but any dark red fruit contains a number of anthocyanins among flavonoids (cyanidin 3-rutinoside, cyanidin 3-glucoside, pelargonidin 3-rutinoside, peonidin 3-rutinoside), and also hydroxycinnamic acids and derivatives.

Cherry leaves have a comparatively high amount of vitamin C. Seeds contain fatty oil and amygdalin. But in general, cherries are not the champion in vitamin content. It is valuable as a storehouse of antioxidants. Moreover, unlike cherries, which have a little more anthocyanins, cherries are rich in polyphenols, thanks to which cells receive protection from oxidation and damage.

Medicinal properties

Relatively recently, in the first decade of the 21st century, scientists paid special attention to the flavonoid substances contained in sweet cherries - anthocyanins. These are plant glycosides, which in plants are "responsible" for the red, purple, blue colors of fruits or leaves. The closer the color of the product to this spectrum, the more anthocyanins it contains. And since so many varieties of sweet cherries have just a burgundy and thick red color, the "bird cherry" has become the focus of attention of scientists.

Physicians are interested in anthocyanins, because with the help of this substance the plants themselves are protected from ultraviolet radiation, and in relation to people, the properties of anthocyanins can be used in the fight against oncological formations. During its growth, the cancer cell requires intensive nutrition, which provokes an increase in the number of blood vessels and capillaries. Anthocyanins, on the other hand, are able to block nutrient channels, limiting the flow of resources to the cancer cell, as a result of which it dies "from hunger".

Also, fresh cherries contain a lot of potassium, which helps to strengthen the heart muscle and normalize the pulse. Cherry biologically active substances (for example, organic compounds such as coumarins) can prevent blood clotting, so regular use of "bird cherries" reduces the risk of blood clots, being the prevention of heart attacks and strokes.

Cherry fruits have a weak diuretic effect, as well as the ability to reduce the concentration of uric acid in the blood plasma, which is used to relieve attacks in patients with gout. However, it is more effective to use fruit extracts for this, and not just eat "berries".

Some studies indicate the ability of cherry fruits to lower blood pressure. However, it is important to correctly establish the mode of use of the product and its quantity. So, studies have found that significantly upper and lower blood pressure indicators decreased within two hours after drinking a large glass (300 ml) of cherry juice. The effect lasted about 6 hours. At the same time, the division of the same volume into three parts with its hourly use did not have a similar effect on pressure indicators.

In achieving a therapeutic effect, the age of patients with hypertension and the duration of "cherry therapy" also mattered. So, in elderly people who drank a standard glass (200 ml) of freshly squeezed cherry juice daily for 6 or 12 weeks, there was a decrease in mean systolic blood pressure. The diastolic pressure remained unchanged.

Recently, the radioprotective properties of cherry juice have also been determined ^[6]. This means that the systematic use of this drink is potentially able to protect the body from radiation by preventing the effects of radioactive isotopes on the organs. However, this property is still in the initial stage of study.

Among the general confirmed effects produced by the use of sweet cherries, we can name the harmonization of sleep, stress relief, improved mood of the subjects, increased ability to memorize and perceive new material.

Use in medicine

Despite the numerous medicinal properties of cherries, it is used as a raw material mainly in dietary supplements and sports nutrition. So, a number of Western companies offer cherry extracts in capsules without indicating the recommended daily intake. Easily available on the market are Enzymatic brands Therapy , Puritan's Pride .

The use of sweet cherries in modern folk medicine is based on supposed expectorant, antipyretic, and tonic effects. Traditional healers are also known for the sedative (sedative and hypnotic) effect produced by water infusions of cherry fruits. There are recipes for the use of cherry juice to combat fungal infections, the effectiveness of which is confirmed by medical research.

But traditional healers use not only berries. For example, tea from the flowers of "bird cherry", as well as a decoction of its branches, is actively used as a remedy for diseases of the oral mucosa and gums, as well as a sedative for burns. A decoction of sweet cherry stalks has a pronounced diuretic effect. However, although experimental testing confirmed this effect, the risks of using this decoction for urolithiasis were also identified. The danger is associated with a strong leaching (excretion) of calcium salts when using doses recommended by healers.

Decoctions

Below are the recipes for the two decoctions of stalks and branches mentioned above:

- To prepare a decoction of the stalks, 1 liter of water is brought to a boil, after which a large handful of well-washed cherry "tails" is lowered into it. For 5 minutes, the stalks are boiled over low heat and left for half an hour in a saucepan to cool. This amount of broth is enough for two days.
- In a decoction of branches, young shoots of sweet cherries are collected, thoroughly washed and crushed, and then boiled over low heat for 2-3 hours. With a cooled filtered liquid, you need to rinse your mouth two or three times a day to stop inflammation.

in oriental medicine

In Chinese traditional medicine, it is customary to divide all foodstuffs according to the criterion of the presence / absence of two opposing principles, Yang and Yin. For gradation and convenience of stabilizing the balance of these principles in the body, a scale is introduced with divisions from "-3" (for foodstuffs with the maximum concentration of Yin energy) to "+3" (with the maximum concentration of Yang energy). Cherry is on the +1 position on this scale, moderately and gently increasing activity and mobility, stimulating progressive movement, strengthening hardness and strength. At the same time, products with moderate values close to zero ("-1" and "+1") are considered more preferable, in contrast to products located at the edges of the scale, which are recommended to be used with great care.

A completely different approach to the use of cherries and sweet cherries was professed in the ancient Persian tradition. It was a mixture of folk beliefs and experimental medicine, in which the nature of the cherry was defined as "hot in the 1st degree and wet" (for comparison, the nature of the cherry was considered "cold in the 2nd degree and wet") [7]. With the help of cherries, the ancient Persians got rid of thirst, nausea, bilious vomiting, and high blood pressure. It was believed that cherry seed juice, to

which anise seeds are added, helps to remove stones, cure diseases of the bladder, and facilitate the flow of menstruation.

Cherry gum dissolved in wine, according to the plan of Persian doctors, was also supposed to fight stones in the bladder, as well as get rid of lung ulcers, hemoptysis, suffocation and cough caused by it [8].

Some of the treatments were extreme. So, for example, one of the ancient treatises on Middle Eastern medicine offered a recipe for treating urinary canal ulcers and getting rid of pus. It recommended crushing the kernels of the fetal bones and introducing the mixture along with the wick into the opening of the penis. This procedure was painful, but patients agreed to such radical measures, tired of constant torment and under the influence of the authority of doctors.

The Persian medieval medical school, whose central representative was the famous Avicenna, was indeed very revered and progressive for its time. It is not surprising that from the XII-XIII centuries it became widespread in the West. The author of the Salerno Code of Health, Arnold of Villanova, who studied the works of the great Persian healer at the Faculty of Medicine in Montpellier, gives his assessment of the healing effect of "bird cherries":

"If you eat cherries, you will receive considerable benefits:

They cleanse the stomach, and the core - relieves stones;

You will have good blood from the pulp of the berries.

I must say that due to the external similarity of cherries and sweet cherries, the ancient healers did not always distinguish them. Often, only by indirect signs, if any were given (taste characteristics, pulp density, color of berries, etc.), it could be assumed that the recipes were talking about sweet cherries. Until now, in some modern Western scientific studies, such a distinction is not indicated, and then we have to talk about the overall effect of the use of these drupes or experimental preparations based on them.

In scientific research

In the spring of 2018, the scientific journal *Nutrients*, which publishes research and reviews on all aspects of nutrition, published a review of the results of 29 controlled scientific experiments conducted on volunteers who used either cherries and cherries, or juices from them, or preparations based on them in various programs. The bulk of the materials (20 works) were devoted to the "more promising" cherry. In 2 studies, cherries and sour cherries did not differ. In 7 experiments, scientists worked exclusively with cherries, the "daily dose" of which varied between 45-270 "berries". (When studying the effect of preparations and extracts, the daily dose of biologically active substances was recalculated by the number of fruits containing them).

Not all experiments unambiguously confirmed (or refuted) the studied effect, but, in general, they were able to demonstrate the potential of these "drupes". In summary, the results looked like this:

- In 100% of experiments, the use of "berries" and drugs reduced the concentration of uric acid, which reduced the frequency of gout attacks, improved the condition of patients with osteoarthritis.
- In 80% of cases, based on the reaction of special markers, scientists recorded a weakening of the oxidative process, which gave reason to talk about the direct antioxidant effect of sweet cherries.

- 71% of the results confirmed the ability of sweet cherries to lower blood pressure.
- In 69% of studies, an anti-inflammatory effect was found that improves the condition of blood vessels.

Thus, in the fight against arthritis, the action of cherry anthocyanins contributed to a decrease in the concentration of uric acid in plasma and facilitated attacks in patients. Experiments on mice and rats also confirmed this. At the same time, it was found that it is more effective to use extracted anthocyanins or cherry extract, and not just eat the fruits, to get the result ^[9].

The anti-inflammatory effect was confirmed by an experiment in which healthy men and women consumed 280 g of cherries daily for 28 days. The researchers took blood from them and tested it for the presence of inflammatory markers (for example, C-reactive protein, whose concentration in blood plasma increases with inflammatory processes in the body). In the middle of the experiment and at its end, it was found that the concentration of most markers decreased ^[10].

Polyphenols, melatonin, carotenoids, and vitamins E and C give cherries antioxidant and anti-inflammatory properties. Therefore, its use helps to reduce the level of oxidative stress in the body ^[11].

To determine the effect of sweet cherries on human pressure, the Bing cherry variety, popular in the United States, was chosen. The scientists found that the upper and lower blood pressure significantly decreased within 2 hours after a single consumption of 300 ml of fresh cherry juice and returned to normal within 6 hours. However, if a person drank 100 ml of juice every hour, then this did not have any effect - neither the upper nor the lower pressure decreased. From this, the scientists concluded that both the dose and digestion time are important for lowering blood pressure ^[12].

In another study, 200 ml of freshly squeezed cherry juice per day (or 138 mg of anthocyanins per day) reduced mean systolic (upper) but not diastolic (lower) blood pressure in older people after 6 and 12 weeks of daily use. A control comparison was made with a group that received placebo for 12 weeks ^[13]. The effect is associated with the influence of sweet cherries on the reduction of the endothelin-1 peptide in the body, which causes vasoconstriction and impairs blood flow.

According to various studies, eating cherries does not have a significant effect on the level of sugar and insulin in the body of a healthy person. But drinking cherry extract before contracting diabetes helped prevent its development in rats ^[14]. Also, thanks to anthocyanins, hydroxycinnamic acids and flavonols, glucose uptake by hepatocytes (liver cells) is stimulated. In addition, anthocyanins slow down the release of glucose from complex carbohydrates and stimulate the production of insulin by beta cells ^[15]. In general, scientists believe that cherries contribute to the regulation of blood glucose levels, but it is not yet clear how much they can actually prevent the development of diabetes in humans.

In mice, adding cherry extract or pure anthocyanins to a high-fat diet reduced blood glucose and triglycerides (unhealthy fats) in mice (compared to rodents not fed cherries) ^[16].

Dietary pntocyanins from sweet cherries also improved lipid metabolism in the liver in mice ^[17], attenuating diet-induced hepatic steatosis (fatty infiltration of the liver), which in humans is considered the most common hepatosis characterized by abnormal accumulation of fat in cells.

In addition to the therapeutic effect, scientists also studied the effect of sweet cherries on the state of the nervous system, the quality of sleep and human cognitive abilities.

So it turned out that sweet cherries even better than cherries affect the quality and duration of sleep. The results become noticeable after 3 days after daily consumption of 140-145 g (or 25 berries) of

sweet cherries. There is also a decrease in the level of cortisol (stress hormone) in the urine, a decrease in anxiety and an improvement in mood ^[18].

The influence of sweet cherries on cognitive abilities was determined in an experiment with grown neuronal cells. Scientists have found that the polyphenols contained in the "berry" help cells protect themselves from damage caused by increased oxidative stress ^[19]. Animal experiments have also demonstrated the positive effects of anthocyanins on memory.

Weight regulation

"Cherry weight loss" is considered one of the most pleasant and easily tolerated among all "berry diets". 100 grams of the product contains only about 50-60 kilocalories, but at the same time, cherries give a person a feeling of satiety, which greatly simplifies control over the process.

With the use of cherries, express diets and fasting days are the most popular. They will not provide stable long-term weight loss, but they will help to temporarily get in shape.

- Fasting day.

For a day, you need up to 2 kg of sweet cherries and 1 liter of kefir or low-fat drinking yogurt. The entire volume of products is divided into 5 servings and eaten (drinking) during the day. If in the intervals between meals there is a feeling of hunger, it is recommended to muffle it with plain water or herbal teas. The amount of water drunk while drinking is not limited. Sometimes the "unloading day" can be stretched for 3 days. It is believed that with this diet you can lose up to 4 kg.

- 7 day express diet.

A week on one sweet cherry without side effects will not survive even the most hardy. Therefore, seven-day weight loss involves only adding cherries as an additional ingredient to each meal.

- *Breakfast:* Oatmeal or cottage cheese (150 g) and cherries.
- *Lunch:* Boiled and lean meat (100 g) and cherries.
- *Snack:* herbal tea and cherries.
- *Dinner:* Baked fish (100 g) and vegetable salad (150 g).

Since the vitamin C contained in the "bird cherry" helps to absorb the iron contained in other foods, the cherry is recommended for people at risk of developing anemia who are going to lose a few extra pounds with the help of diets for the holidays.

In cooking

Cherry goes well with many traditional products for our table. Its fruits are often added to cereals, meat and fish are seasoned with cherry sauces, it is constantly present as a filling in pastries and cottage cheese casseroles. There are, however, rarer ways to cook "bird cherries". Among them is cherry soup. Here is his recipe.

For the dish you will need:

- Sweet cherry - 500 g.
- White wine - 2 glasses.
- Water - 2 glasses.
- Cream - 1 glass.

- Lemon - 1 pc.
- Sugar and cinnamon to taste.

To make soup you need:

1. 1 Wash the cherry fruits and remove the seeds from them.
2. 2 Remove the zest from the lemon and squeeze the juice into a common saucepan.
3. 3 Mix wine, water, juice and lemon zest in a saucepan, add sugar, cinnamon stick and, bringing it all to a boil, simmer for a few minutes.
4. 4 Add the cherries and bring the mixture back to a boil.
5. 5 Remove the cinnamon stick and let the soup cool.
6. 6 Mix the soup with the cream and beat until smooth.

Such a finished dish is sent for 2 hours in the refrigerator, after which it is served chilled.

In cosmetology

As a source of zinc and copper, necessary for the production of collagen responsible for skin elasticity, cherry extracts are included in various skin masks. As a rule, other components are included in the composition of such a cosmetic product, as a result of which natural masks with a cherry component in the base can perform different functions:

- smooth wrinkles on the face (for example, Vileta sheet mask with cherry extract);
- cleanse and moisturize (for example, the Japanese mask Japan Gals natural fruit mask);
- nourish and protect (for example, a hand mask with cherry extract and vitamins from the German brand LCN);
- have an anti-inflammatory effect, protecting against acne, blackheads and blackheads (for example, Luchix Shark Retinol face mask with Roman chamomile and cherries).

Cherry seed oil can be found in natural lipstick base formulations. The antifungal effect of the juice is used in home remedies to treat affected nails. Shampoos based on cherry extract are advertised as products that can, due to the action of B vitamins, give hair a lively shine and density.

Dangerous properties of cherries and contraindications

From the use of fresh cherries, gastroenterologists warn people suffering from adhesive bowel disease and other patency disorders, as well as people prone to flatulence. Also, with great care and in small portions, you should try cherries for patients with ulcers and gastritis with high acidity. In addition, the sugar content of cherries makes it a "difficult" product for diabetics.

However, doctors warn that even healthy people should not abuse cherries and lean on them soon after a hearty meal. Vegetable fiber, which is found in abundance in fruits, can lead to distension of the intestines and discomfort in the stomach. If you want to eat more, it is advisable to wait about 0.5-1 hour - this will help to avoid indigestion.

Selection and storage of cherries

A competent approach to the choice of cherries requires attention both to the fruits themselves and to those who sell them. Therefore, cherries are advised to be purchased where they pass safety and quality control. Even for the loose "berries" purchased on the market, upon request, documents confirming the passage of the test must be provided. You can find out about the place and conditions for the growth of fruits from the seller or, if the cherry is sold packaged, on the label.

Minor defects (dents and cuts), which buyers often do not pay attention to, lead to rapid deterioration of the fruit and the appearance of a characteristic putrid aroma of fermentation. A similar smell is one of the main indicators of the condition of the fruit.

Since sweet cherries often begin to deteriorate from the stone, the onset of decay processes can also be recognized by the state of the stalk (vegetable “tail”). Fresh cherries are green and not dried out. A dry and darkened stalk indicates that the berries have been stored for a long time and there is a higher chance that they have begun to deteriorate.

Experts advise not to rush and buy cherries at the height of the season, which lasts 1-1.5 months - from late May to early July. During this period, the fruits are both tastier and healthier. At the same time, the color of a ripe berry is more dependent on the variety and it is necessary to focus on it only after adjusting for varietal differences.

There are varieties of sweet cherries that have a pink color even during the period of maximum ripeness. Such fruits differ from dark ones in a less saturated sweet and sour taste, but they contain more vitamin C. Yellow varieties are also characterized by pronounced sourness. However, they are more difficult to transport (send) because, due to their thin skin, they require careful handling. If sweet, bright taste and a high content of organic acids are more attractive in cherries, then it is better to choose dark red, burgundy or almost black varieties. They are also recommended for use in canning.

Early varieties of cherries are poorly suited for storage, so they are best eaten immediately after purchase. But later varieties should be stored in the refrigerator, in a container with a lid. Moreover, before this, the berries should be washed, dried, the stalks should be separated and only then sent to the coldest place in the refrigerator.

There is another storage method that does not require the removal of “tails”, which is especially important for varieties where the peduncle is very tightly attached to the fruit and is separated only when it is damaged (for example, the variety “Valery Chkalov”). A layer of cherry leaves is placed on the bottom of a glass jar, berries are placed on top of them - also in one layer, and then several more layers of berries and leaves alternately. The jar is tightly closed with a ground-in lid and placed in the refrigerator. After such preparation, sweet cherries can be stored for up to 2 weeks without loss of taste and useful qualities.

Interesting Facts

Sweet cherry is a familiar tree for the inhabitants of Asia and the southern regions of Europe, and with the development of frost-resistant varieties, it has become not uncommon in more northern countries. However, some facts diverge from generally accepted ideas about this plant and its fruits.

- A cherry tree can reach a height of 25-30 meters, although plants not exceeding 5-10 meters are more common in gardens.
- Food coloring is made from cherries, however, contrary to expectations, it is not red, but green.
- "Bird cherry" this plant was called, apparently, for the love of birds for its fruits. Even city sparrows do not refuse the desire to peck ripe berries.
- One hectare of a blossoming cherry orchard provides "raw materials" for 35 kilograms of pollen collected by bees.
- It is incorrect to call cherries a "berry" in the classical sense of the term, since one of the botanical characteristics of berries is the presence of many seeds inside the fruit. Therefore, in a “serious conversation”, what is popularly called “berries” is more correctly called “stone fruits”.

- According to some psychologists, people who name cherries as their favorite delicacy have a soft, complaisant character, are characterized by sincerity and childish spontaneity, love small surprises and are ready for sacrificial behavior for the sake of another person.

There are still few monuments to cherries in the world, in comparison with monuments to other vegetables and fruits. One of the few is located in the city of Minneapolis (USA). Since 2012, they plan to install their monument in the Ukrainian "cherry capital" - the city of Melitopol. And before it came to the implementation of the projects presented, in the city, on one of the walls of a high-rise building, a 27-meter mural appeared with the image of a fruit-bearing branch of the "bird cherry".

During the time of the tsarist empire, Melitopol sweet cherries were famous in France, where they were sent in barrels filled with special solutions. Until the middle of the 20th century, a store operated in Paris, which was called "Melitopol Cherry". In addition to climatic conditions, the taste qualities and, as a result, the popularity of the Ukrainian product were provided by special Azov soils formed after the melting of an ancient glacier. Ideal cherry soils were formed due to the fact that 70-90 cm of easily warmed sand was applied over a one and a half meter layer of black soil.

The appearance of cherry gardens in southern Ukraine is associated with the names of the doctor Andriy Korvatsky and the landowner-philanthropist Louis Henri Philibert, one of whom was a distant relative of the Hungarian king, and the other was a descendant of the Huguenots who moved from France to the Netherlands.

Varieties and cultivation

The ripening time of cherry fruits depends on the variety. The earliest ones ripen in the second half of May, and the latest - by the end of June. Dozens of varieties of cherries are known, each of which is remarkable for something. But all of them, in addition to advantages, have their drawbacks.

- **"Valery Chkalov"**. Frost-resistant (a third of the buds survive at -24 °C) and a relatively early variety (ripens in the first decade of June) was the result of the joint work of specialists from the Melitopol Horticulture Experimental Station and the Michurinsk Central Genetic Laboratory. Fruits reach 6-8 grams, having a dark red, almost black color. Pinkish streaks are clearly visible in the pulp. This variety is distinguished by a bright taste and juiciness of sweet cherries, which are also suitable for canning. However, there are also disadvantages: the tree is often affected by gray rot, coccomycosis and other fungal diseases, which can completely destroy the crop.
- **"Regina"**. The variety was specially created by German breeders on the basis of other varieties "Roubet" and "Schneider" as a cherry with late fruiting, ripening by mid-summer. The pulp has a honey-sweet taste with a slight sourness. The fruits themselves are dense, tolerate transportation well. The key disadvantage is the need for the presence of pollinators of other varieties.
- **"Red Bittner"**. Also a German variety, which is already more than a dozen years old. In Poland, it "took root" so much that it received the local regional names "Napoleonic" and "Poznań". The skin of the fruit is yellow, but well-lit cherries are covered with a brilliant blush. The pulp is light yellow in color, colorless juice is extracted from it. The disadvantages of growing include the danger of cracking the skin in rainy weather (which helps with spraying with calcium preparations), and the disadvantages of storage are sensitivity to pressure when full ripeness is reached. For the same reason, Red Bittner cherries are harvested for transportation a little earlier than ripening.
- **"Bull Heart"**. The name of the variety speaks for itself: the fruits are large (7-10 g), flat-round in shape, vaguely resemble a heart. They have the highest tasting rating, and compotes from this sweet cherry are distinguished by a rich, beautiful dark red color. However, according to

the characteristics of keeping quality and transportability, this variety is inferior to many other varieties. At the same time, the tree has high winter hardiness and is immune to fungal diseases and, in particular, to coccomycosis .

- **"Yellow"** . Early sweet cherry with ripening in early June (even a little earlier than the variety "Valery Chkalov"), bred on Artyomovskaya OSS. The skin is thin, but dense. A unique taste is created by a combination of bitterness and sourness. The fruits reach a mass of 8-12 g and are widely used for jams and compotes.

The entry of a tree into fruiting, the strength of its growth, the quality and quantity of the fruits obtained depend mainly on the rootstock - a plant, to the root system (or stem) of which a cutting of a cultivated variety is grafted. Today, many vigorous and dwarf rootstocks are known, each of which has physiological compatibility with some sweet cherry varieties and incompatibility with others.

Due to the fact that sweet cherry belongs to very vigorous fruit trees, breeders for a long time could not find a way to effectively limit its growth. Only since the 60s of the XX century there has been a qualitative change in the selection of dwarf rootstocks, which, starting from the 70s, led to a breakthrough in horticulture when growing this crop. Nevertheless, even today, when choosing rootstocks for specific varieties, it is necessary to take into account a huge number of factors that affect the size and quality of the crop: from frost and virus resistance to the number of root suckers and planting density. As a result, each gardener creates his own unique knowledge base to get the best harvest.

So, for example, their innovative methods of growing sweet cherries on frost-resistant rootstocks are practiced in the Dutch nursery Fleuren , which annually sells about 400-450 thousand plant seedlings. In order to achieve the optimal ratio of juiciness, berries, their taste, caliber, resistance to damage, transportable endurance, the speed of the orchard entering full fruiting, its protection from climatic factors, etc. , the nursery workers abandoned the tall rootstock " Colt " and began to grow small trees. It turned out to be easier to protect them from bad weather and birds. In addition, this simplified the collection of fruits, and the compacted planting pattern made it possible to obtain a larger yield from the same area.

More than 20 varieties of cherries and cherries are grown in the nursery, among which are the most popular in the world Burlat , Vanda , Merchant , Karina , Kordia , Regina , and for each variety its optimal stock is selected. In Fleuren , depending on the cherry varieties, the rootstocks "Gisela" -3, -5, -6 and -12 were chosen.

However, despite the successful Dutch experience, not every farm manages to create the optimal combination of planting density, soil characteristics, irrigation regime, herbicide application, etc. Dwarf rootstocks require the use of well-drained, nutrient-rich soil and stable watering during dry periods. Hungarian breeders, for example, in one of the farms, not equipped with an irrigation system, on varieties Alex and Katalin failed to get large and beautiful fruits when using the rootstock "Gisela-5", which is considered more demanding on growing conditions than "Gisela-6" . At the same time, such a problem did not arise in neighboring Poland in prepared farms - the root system of plants, even during a snowless winter, demonstrated frost resistance, which, among other things, also contributed to the growth in popularity among European and American gardeners of both Gisela-5 and Gisela-6 ".

Colt rootstock is still quite in demand , which absorbs magnesium and calcium better than many others. On sandy, permeable soils, this creates an advantage by relieving cherries of magnesium deficiency. Nurseries grow seedlings on Colt also because it reproduces well with the usual horizontal layering. However, this stock is not frost-resistant enough and from the age of 6-7 it has a delayed incompatibility with such popular varieties as Burlat and Summit .

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Cherries - useful properties, composition and contraindications

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



Strawberries (lat. *Fragaria*)

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

Keywords: strawberries , useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

100 g of fresh strawberries contain [1]:					
Main substances:	G	Minerals:	mg	Vitamins:	mg
Water	90.95	Potassium	153	Vitamin C	58.8
Carbohydrates	7.68	Phosphorus	24	Vitamin PP	0.386

Sugar	4.89	Calcium	16	Vitamin E	0.29
Alimentary fiber	2	Magnesium	13	Vitamin B6	0.047
Squirrels	0.67	Sodium	one	Vitamin B1	0.024
Fats	0.30	Iron	0.41	Vitamin B2	0.022
calories	32kcal	Zinc	0.14	Vitamin A	0.004

Strawberries are most useful fresh. Like other berries, it contains a large amount of essential nutrients, but, in addition, it is low in calories. Moreover, this fruit has a low glycemic index - 40 units, and can be used in diabetes. Frozen strawberries lose some of their beneficial properties, but still bring much more benefits compared to strawberry jam and jam. After heat treatment, the berries are deprived of a significant part of vitamins and minerals, and absorb a large amount of sugar.

Medicinal properties of strawberries

Strawberries are the richest source of such nutrients as vitamins A, B, C, E and minerals (potassium, phosphorus, calcium, magnesium, calcium, iron, iodine, manganese). In addition, the berry contains a whole range of non-nutritive biologically active components (phenolic compounds), which together have a synergistic effect on the body, improving health and preventing the development of various diseases. In particular, strawberries contain ellagic acid and flavonoids, including anthocyanins, catechins, kaempferol, quercetin, etc.

Note that one of the main advantages of phenols is their ability to fight free radicals. This struggle is expressed in the neutralization of the destructive effect of active oxygen on cells. Thus, these compounds contribute to the protection of the body and reduce the risks of developing diseases that arise due to oxidative stress (cardiovascular diseases, obesity, type 2 diabetes, various inflammatory processes, and even cancer).

The mechanism of protecting the body from cardiovascular diseases is simple - phenols help reduce the level of "bad" cholesterol and improve the functioning of the endothelium (the inner lining of blood vessels). The latter is a special endocrine organ, "scattered" throughout the body. It is responsible for the production of substances that control such important processes as blood clotting, contractile activity of the heart, metabolic support of the brain ^[5].

As for the fight against diabetes, then, firstly, it is believed that the berry is quite safe for people with an already developed disease. Secondly, after conducting an experiment in which 1000 women of different ages took part, British scientists came to the conclusion that a high concentration of adiponectin contained in strawberries restores the sensitivity of body cells to insulin and thus reduces the risk of developing diabetes.

With cancer, things are not so obvious, but scientists have recorded improvements in the condition of patients with a precancerous condition of the stomach after adding strawberries to their diet. It is assumed that antioxidants slow down the division of pathogenic cells and prevent the development of inflammatory processes. Scientists claim that the red pigments anthocyanins are also a good prevention of cancer of the mucous membranes. Experiments on mice have shown that there are substances in strawberries that inhibit the growth of breast tumors and significantly complicate the process of metastasis in breast cancer.

However, as recent studies show, phenolic compounds not only fight the influence of free radicals and related diseases, but are also able to protect and even "repair" damaged DNA. They improve cell metabolism and supply peripheral tissues with oxygen and glucose.

If we talk about the vitamin complex traditionally rich in berries, then you should pay attention to the fact that, in addition to vitamins of groups B, E and A, strawberries have a very high content of vitamin C (higher than that of lemon). In addition, it successfully combines the presence of ascorbic and folic acids and iron, which makes it very useful for iron deficiency anemia. Vitamins C and E also have an important effect on the condition of the skin, promoting the synthesis of collagen and elastin.

Strawberries contain 20% of the daily intake of manganese. This element is important for the body in terms of the synthesis of serotonin and maintaining the proper functioning of enzymes. Manganese also nourishes intervertebral discs and, along with calcium, phosphorus and magnesium, helps strengthen bones.

In addition, strawberries contain a fairly large amount of dietary fiber that is not absorbed in the small intestine. They have a positive effect on the digestive processes, improve intestinal motility, and also feed the beneficial bacteria that live in the colon.

Finally, it is no coincidence that strawberries are considered a symbol of sensuality and voluptuousness. Scientists have confirmed that this berry is a natural aphrodisiac that enhances sexual desire. By the way, small bright dots on the berry are seeds that contain a lot of biologically active zinc, which has a positive effect on sex hormones.

The use of strawberries in medicine

Although strawberries have a lot of useful properties, they have not yet been widely used in the pharmacological field. Basically, it is used in the form of natural oil, which is obtained by dry pressing the seeds. Often it can be found among the components of various ointments and creams, the action of which is aimed at treating diseases of the skin. As part of such drugs, oil is usually responsible for regulating the process of keratinization of cells and maintaining a high level of skin moisture.

Also, essential strawberry oil is used in aromatherapy, as part of a comprehensive treatment for mental disorders. Experts consider this fragrance "cheerful", so it is especially often used in the fight against depressive states. By the way, strawberry flavoring is added to many preparations (lozenges, tablets, syrups, potions) to improve the taste and smell of medicines.

The use of strawberries in traditional medicine

Since in our area many people have grown and continue to grow strawberries in their gardens, they began to actively use them in the self-treatment of various diseases. Moreover, in the recipes of traditional medicine, not only the berries themselves are used, but also the leaves, and sometimes even the roots of the plant. However, in no case should you rely only on strawberries. After consulting a doctor, you can use folk remedies as an auxiliary.

- Tea

Given that strawberries are a good diuretic, traditional healers recommend adding berries to tea during exacerbation of kidney failure, nephritis, urolithiasis, and also during inflammation of the urinary tract. Usually, for cooking, they take one tablespoon of tea leaves and half a glass of small berries for 0.5 liters of boiling water.

With metabolic disorders and the inability of the body to completely remove uric acid, a person develops gout, a disease that affects the joints. During crisis exacerbations of this disease, traditional healers recommend brewing tea from strawberry and currant leaves. As a rule, take 70 g of dry raw materials per 250 ml of boiling water. This tea should be drunk several times a day for a week.

A hot drink made from strawberry leaves is also believed to help with colds and inflammation of the gastrointestinal tract. Note that it is best to collect leaves during the flowering period, when all the beneficial substances accumulate in the ground part of the plant. After harvesting, they must be washed and laid out to dry naturally. Usually choose a cool place without access to bright sun. From time to time, the leaves need to be turned over.

- Juice

In some cases, strawberry juice is used instead of berries in folk recipes. For example, with osteochondrosis of the spine, it is necessary to mix it with carrot juice in a ratio of 2 to 1. This drink is taken for a month twice a day for half a glass an hour after eating. In addition, strawberry juice along with a decoction of valerian root helps to overcome insomnia. To prepare the drink, you need to boil a teaspoon of the crushed root in 200 ml of water for 3 minutes, and then add a tablespoon of this broth to a glass of strawberry juice and drink it at night.

The combination of strawberry juice with hot milk is considered a good helper in the treatment of chronic bronchitis. Add 4-5 tablespoons of hot milk to a glass of fresh juice and drink daily until the condition improves. Also, with the help of this berry drink, the treatment of the prostate gland in men is carried out. It is recommended to mix in a blender 1 glass of strawberry juice, 1 banana, half a pear and 1 tablespoon of brewer's yeast. The mixture is drunk 250 ml three times a day before meals.

- infusions

An infusion of strawberries is often recommended for minor constipation or colds as a diuretic and diaphoretic, respectively.

To prepare the drug, 5-6 medium-sized berries and 1 cup of boiling water are used. Brewed mashed fruits insist in a thermos for about 20-30 minutes, then filter and take a drink half a glass before eating. You can also rinse your mouth with this remedy to prevent gum disease and freshen your breath.

Due to the fact that strawberry leaves contain phytoncides - substances that protect plants from the adverse effects of the environment, they are used to combat inflammation in the body. For example, an infusion of leaves with the addition of berries is used to gargle with laryngitis and sore throat. To prepare this remedy, you can take both fresh berries and leaves, and dried ones. For 0.5 liters of boiling water, usually 2 tablespoons of chopped fresh raw materials or 1 tablespoon of dry raw materials are enough. Boil with boiling water, the drink should be left to infuse for 2-3 hours, and then applied 3-4 times a day.

Among the folk recipes there is also an infusion that helps to alleviate the condition with tuberculosis. To prepare it, you need to dry 10 stems with berries. Then they are crushed and pour 1 liter of boiling water, insisting for about an hour. Take 2 glasses daily for a month.

Folk healers believe that even neuroses can be dealt with with the help of strawberry infusions. There are several recipes, one of which suggests combining a teaspoon of dried strawberry and wild strawberry leaves with a tablespoon of hop cones. The mixture is poured with two glasses of boiling water and infused for several hours. You need to drink this remedy twice: one glass in the afternoon, and the other before bedtime. According to another recipe, instead of hop cones, add a teaspoon of red clover flowers to strawberry and strawberry leaves and also pour two cups of boiling water. After straining, add a teaspoon of honey to the infusion and drink 250 ml per day.

- Decoction

Strawberry decoctions are made mainly to combat gout, nephritis, colitis, hemorrhoidal bleeding and indigestion. For the preparation of a remedy, fresh or dried leaves and roots are usually used. According to the recipe, 1 tablespoon of raw materials should be poured into 0.5 liters of water and boiled under the lid for 10 minutes. Then strain and consume 2 times a day, 100 ml before meals. You can store the broth in the refrigerator for no more than 2 days.

Outdoor use

Strawberries are considered an effective remedy in the treatment of long-healing wounds, ulcers, eczema, and diathesis. In order to make a bandage, you need to knead a few berries to a puree state, apply to a problem area and bandage, leaving for 30-40 minutes. Used for external use and strawberry leaves. With furunculosis, compresses are made from them. To prepare a medicinal mixture, the raw materials are washed, crushed and poured with a glass of boiling water. It is recommended to wrap the dishes in which the infusion is located in a blanket and leave overnight. Then compresses are made with this infusion.

Strawberries in oriental medicine

According to ancient Chinese medicine, strawberries belonged to the category of foods with a cold and wet nature. With the help of medicinal products prepared on the basis of these berries, they treated hemorrhoids, bleeding, and got rid of worms. The leaves and roots of the plant were used for diseases of the liver, gallbladder, and also for problems with the joints. It was believed that infusions on the leaves helped with skin itching, and the juice of the plant treated female diseases.

In Tibetan medicine, strawberries were considered a real elixir of life and the secret of longevity. They were used to slow down the aging process. Also, ancient doctors believed that strawberries help strengthen the lungs and used it to treat respiratory diseases. In addition, the berries were used for stomach problems.

Strawberries in scientific research

Due to a predominantly sedentary lifestyle and a diet high in sugar and animal fats, more and more people are suffering from various gastrointestinal problems. Scientists from the University of Massachusetts tried to approach the issue by looking for a dietary product that can relieve symptoms or help prevent the development of diseases, and one was found.

Experiments on infected mice have shown that regular daily consumption of strawberries reduces inflammation that occurs in the gastrointestinal tract and also stops bloody diarrhea. The serving size of the berries given to mice is about 3/4 cup of human strawberries. By the way, in mice that received strawberry extract as a dietary supplement, the condition did not improve so much, so it is crucial to consume whole berries. By the way, they, among other things, contribute to the restoration of healthy intestinal microflora ^[6].

The beneficial effect of strawberries on the intestines is also noted by another group of scientists who conducted their research at Ohio University. They tracked patients for six months with esophageal changes that usually precede cancer. All patients daily consumed 60 g of freeze-dried strawberries. As a result, 30 out of 36 people showed significant improvements. Scientists attribute this effect to the action of antioxidants, which reduce inflammation and slow down the division of cancer cells ^[7].

Promising results from a Spanish-Italian study were recently published that examined the effects of strawberry extract on the development of breast cancer in women. So far, the experiment has only been conducted on animals, but the scientists confirmed that the mice whose diet contained the berry

supplement had much smaller tumors than those animals that did not receive it. In addition, phenolic compounds, which cause such an effect, also inhibited the spread of metastases ^[8]. Note that the concentration of phenols in strawberries may vary depending on the variety.

Another group of researchers from Italy and Spain was studying strawberries in terms of their effect on blood counts. Their experiment involved 23 volunteers who had previously taken a blood test. For a month, they consumed 500 g of strawberries daily. After 1 month, they again donated blood for analysis. The results of all participants showed a significant reduction in "bad" cholesterol and maintenance of "good" cholesterol levels. In addition, lipid profiles improved and levels of antioxidant biomarkers increased. 15 days after removing strawberries from the diet, the indicators returned to their original positions. Scientists believe that this effect is due to the activity of anthocyanins ^[9].

A joint study of American and British scientists, which lasted 18 years, demonstrated the effectiveness of strawberries and blueberries in preventing heart attacks in women. 93,600 volunteers aged 25 to 42 filled out a questionnaire about their diet and physical condition every 4 years. It turned out that over 18 years, 406 heart attacks were recorded among these women, but among those who regularly consumed strawberries and blueberries, the number of attacks was 32% less.

Despite the fact that this experiment did not take into account additional factors, such as age, heredity, body weight, the presence of bad habits, etc., scientists came to the conclusion that eating these berries 3 times a week contributes to a significant reduction in the risk of cardiovascular diseases. in general and heart attack in particular ^[10].

A team of Serbian, Italian and Spanish researchers conducted experiments on rats, trying to find out whether the introduction of strawberry extract on the condition of the gastric mucosa, especially after drinking alcohol. As a result of the experiment, it was concluded that strawberry extract (at the rate of 40 mg per 1 kg of animal weight) not only improves the condition of the gastric mucosa, thanks to its antioxidants, but also activates the body's enzymes.

Moreover, in those rodents that received berry extract for 10 days before drinking alcohol, there was a much less intensive development of peptic ulcer in comparison with those animals that did not receive it ^[11].

Strawberry Weight Regulation

100 g of strawberries contain only 32 kcal, so they are often included in various diets, and sometimes they even become a staple. However, the dietary charm of this berry is not only in its low calorie content, but also in the fact that it supplies the body with the fiber necessary to improve the digestion process. In addition, strawberries provide the body with a powerful vitamin and mineral complex.

However, nutritionists still categorically do not recommend making a diet of berries alone and sit down on the so-called strawberry mono -diet. First, it is an allergenic product. Secondly, strawberries are high in acids, which can put a lot of stress on the kidneys.

It is best to develop a balanced diet, in which, in addition to the strawberries themselves, there will be carbohydrates (fruits, greens, potatoes, oatmeal, whole grain bread) and proteins (chicken, turkey, fish, kefir, milk, cottage cheese, low-fat yogurt). All flour products, sugar and fats of animal origin (sausage, lard, fatty meat, cream, butter, etc.) fall under the ban. Strawberries are consumed at 600-700 g per day.

Indicative menu that can be adjusted according to your needs and taste:

- **Breakfast:** mix strawberries with banana, apple and season with low-fat yogurt or spread strawberry-curd mixture on two slices of bread;
- **Dinner:** mix boiled asparagus with chicken / turkey fillet, strawberries, cucumber and parsley, season with olive oil and lemon juice, sprinkle with pine nuts or stew sea fish with beets, carrots and onions, and then eat strawberries with banana and low-fat yogurt;
- **Dinner:** mix a few potatoes with celery sprigs, onions, low-fat cottage cheese, strawberries and season with low-fat yogurt and lemon juice or boil potatoes with carrots and cauliflower, and for dessert a slice of bread with strawberry-curd spread.

For **second breakfast** and **lunch** , you can make oatmeal with strawberries and low-fat yogurt, strawberries with kefir, or a strawberry-banana milkshake.

Strawberries in cooking

Strawberries can be found in almost every cuisine in the world. We traditionally use it as a separate dessert or serve it with ice cream, cream, yogurt, waffles, pancakes. Chocolate-covered strawberries are also popular, and at home, people usually eat strawberries with sugar. These berries are often used to make fillings for pies, pies and cakes. In addition, strawberry-based drinks (juices, lemonades, smoothies , cocktails, etc.) are popular with us.

However, in other countries there are other traditions of using strawberries in cooking. For example, in addition to sweet dishes, these berries go well with seafood and poultry. They also go well with lettuce, arugula , spinach, cucumber, avocado, cheese, pine nuts, so they are often added to salads. As a dressing, olive oil with lemon juice is usually used. These berries are also used to make a delicious strawberry-wine sauce, and they are also added to Spanish cold gazpacho soup . In China, they even released a series of strawberry-flavored chips.

Italians who are obsessed with pasta came up with a recipe in which pasta dough is kneaded with strawberries. If you like experiments, then preparing such a dish is not difficult at all. For the dough you will need: 2 cups flour, 1 cup fresh strawberry juice, 2 eggs, 1 tablespoon olive oil, 1 teaspoon honey, salt, pepper. The dough should be thick, then it needs to be rolled out as thinly as possible, and then cut into strips. It is best to boil such a pasta in milk.

Quite interesting in taste is an appetizer of strawberries with black pepper and spices. For cooking, you need 300 g of strawberries, 50 g of butter, spices and pepper to taste. The berries are cut in half, sprinkled with spices and sent to the oil heated in a pan for 3 minutes.

Note that nutritionists recommend combining strawberries with dairy products (especially if you eat them in large portions), since the calcium contained there can help neutralize excess acids that enter the body from berries.

Strawberries in cosmetology

The cosmetology market is full of products containing strawberry extract. We are talking about cleansing creams, lotions, face masks, moisturizing hand creams, shampoos and balms. Given that strawberries produce a whitening effect, they are often used in brightening masks.

Spanish and Italian scientists have conducted research that gives hope for an effective sunscreen based on strawberries. In the lab, they placed the berry extract on human skin cells and exposed them to ultraviolet light equivalent to 90 minutes of sun exposure in the summer. The extract was found to have a protective function and reduce DNA damage. Scientists hope that the new tool will help protect

the skin from ultraviolet radiation, prolonged exposure to which causes the development of various skin diseases, including cancer. ^[12].

By the way, strawberries are often used in case of sunburn. The berries are mashed and applied to the affected areas of the skin in order to relieve discomfort and help the skin recover faster.

The most popular use of berries in home cosmetology is the preparation of face masks. Usually they are applied for 15-20 minutes, and then washed off with warm water or chamomile tea. For dry skin, the following options are recommended:

- 1 egg yolk, 1 teaspoon olive oil, 1 teaspoon sour cream. To give a thicker consistency, you can add brown bread crumbs. This mask should have a tonic effect.
- 1 teaspoon strawberry puree, 1 teaspoon sour cream, 1 teaspoon starch and 1 teaspoon almond oil. This mask makes the skin more elastic and nourishes it.

When caring for oily skin, the following recipes may suit you:

- 1.5 tablespoons strawberry puree and 1 egg white. This mask eliminates excess fat and helps fight blackheads.
- 2 tablespoons of strawberry puree and half a tablespoon of white clay. The mask refreshes and dries the skin.

If you are the owner of combination skin, then this mask should suit you:

- 1 teaspoon low-fat smooth cottage cheese, 1 teaspoon strawberry puree, 1 teaspoon cream and 1 teaspoon olive oil. This remedy nourishes the skin and restores the sebaceous glands.

If you have a normal skin type, then instead of masks, you can use strawberry water. To prepare it, you need to take 100 g of berries, turn them into puree and pour 1 glass of warm boiled water. After 30 minutes, strain and apply the liquid to a cleansed face with a cotton pad.

Dangerous properties of strawberries and contraindications

Strawberries, like any other product, are beneficial if you follow the measure in its use. Do not rush to eat the first berries. Of course, there are early ripening varieties of this plant, but, unfortunately, strawberries are often subjected to aggressive chemical treatment to speed up their ripening.

Note that this berry is a strong allergen, so it was not previously recommended to give it to children at an early age. However, now experts believe that the earlier children come into contact with allergenic products, the less likely they are to develop allergies. Naturally, you should start with small portions and monitor the reaction of the body. Also, modern experts consider unfounded warnings against the use of strawberries by pregnant women. If you did not have allergies before pregnancy, then a moderate portion of berries will not bring any harm.

But still, it is recommended to exclude strawberries from the diet when:

- cystitis and inflammation of the bladder;
- exacerbation of an ulcer;
- gastritis with high acidity;
- attacks of gout;

You should also limit the use of strawberries while taking enalapril -based antihypertensive drugs , since the combination of the drug with strawberries will increase the burden on the kidneys.

Interesting Facts

- Rounded or cone -like fruits, which we are accustomed to consider as strawberries, from a botanical point of view, are the receptacle of the plant, and the real fruits are small yellow grains, the so-called nuts. However, if we use the usual terminology, then the largest strawberry in the world was grown by the Japanese farmer Koji Nakao . Scientists believe that the weight of 250 g of the berry was achieved due to mutations that occurred as a result of too low temperature effects ^[13] .
- Impressive with its size is a 100-kilogram pie with strawberry filling, which, according to tradition, is prepared annually at a festival dedicated to this berry in Baikalsk. A monument to strawberries was recently opened here. Large-scale strawberry festivals and holidays are also held in Balakovo (Russia) and Plant City (Florida, USA), and a corresponding thematic museum has opened in Belgium.
- Strawberries and cream are a traditional treat for fans at Wimbledon. During this Grand Slam tennis tournament, berries harvested in Kent are delivered early in the morning to the arena where the competition takes place. There they are cleaned, laid out in transparent bowls and poured with cream. According to the organizers, during the tournament (2 weeks) tennis fans eat about 28 tons of strawberries under 7000 liters of cream.
- The image of strawberries in general has deeply entered into all spheres of public life, especially those associated with romance. The well-known Turkish melodramatic series, which is called "Strawberry Aroma", tells the story of the love of a girl who dreams of becoming a confectioner and an enviable wealthy groom. It was strawberries as a "berry of love" that became a symbol of the relationship of young people. Various dream books describe the appearance of strawberries in a dream in a similar way. In particular , Wangi 's dream book believes that berries dream of realizing "tempting pleasures", and eating strawberries - to complete harmony in love.
- The real results of odor research in the field of romantic and sexual attachments are not so unambiguous and depend on many concomitant factors. A Chicago study by Dr. A. Hirsch , a neurologist, shows that men who have had frequent sex during the current month perceive the smell of strawberries as more preferable compared to men who have not had sex during this time ^[14] .

How to choose and how to store strawberries

There are no special secrets for choosing fresh strawberries. It is necessary to smell the berries, they must exude aroma. They should also not have external damage and brown spots. The berry should be elastic and not wrinkled. The color is red without white areas that indicate immaturity. You should also take strawberries with green tails, otherwise they will quickly release the juice.

Berries are a perishable product that should be stored in the refrigerator for no longer than 3 days. If you want to make preparations for the winter, then the most useful for the body will be frozen berries, which retain almost all the useful elements. Now the method of open freezing is popular, when you wash the berries, peel them from the tails, put them on a board or tray in one layer and send them to the freezer. When the strawberries are frozen, they can be transferred to a container or bag.

There are also traditional methods of preserving and processing strawberries into jams and compotes. However, when cooked, strawberries lose all of their vitamin C and many other nutrients. Many do not process strawberries, but grind them fresh with sugar in a ratio of 2 to 1. However, such an amount of

granulated sugar eliminates the usefulness of the berries. It is better to dry strawberries at a temperature not exceeding 50 degrees. This will save most of the vitamin and mineral complex.

Note that in our time, making preparations for the winter is optional, because fresh berries can be enjoyed all year round. Even in the off season, strawberries brought from China, Turkey, Armenia, and Egypt are on the shelves. True, often such berries do not have the usual aroma and taste, many consider them "plastic". The thing is that large retail chains specifically make orders to breeders for breeding varieties that bring large yields and can be stored for a long time during transportation. These berries differ in taste and smell, but the composition of useful properties in most cases remains intact.

A few words should also be said about the chemical processing that strawberries undergo. The one that is imported to us from abroad is placed in special chambers before transportation, where the concentration of carbon dioxide is increased by 250 times. Thus, metabolic processes in the berry slow down, although this does not cause much harm, and even helps to retain more minerals. However, almost any strawberry is processed during flowering and ripening, and, I must say, the berry absorbs pesticides and nitrates very easily.

There are many ways on the Internet to find out at home whether berries have been chemically treated. However, according to scientists, all these methods are absolutely non-working, because micrograms of harmful substances get into each berry and this does not affect its physical properties (aroma, density, juice release rate, etc.). Reliable results can only be obtained in laboratory conditions.

Growing features

Before talking about the features of growing strawberries, it is necessary to understand what kind of berries we are talking about. Initially, the names "forest strawberries" or "garden strawberries" were called the spherical fruits of green strawberries or garden strawberries, however, in the scientific classification, the name "strawberries" was assigned to the berries of nutmeg strawberries. According to botanists, their main difference is that strawberries (muscat strawberries) have dioecious flower stalks, that is, there are bushes with male and female flowering, and for strawberries (green and garden), the male pollinator is in the flower itself.

The same story is with the name "Victoria", which has long been in use to refer to a variety of garden strawberries, which used to be called strawberries. Due to the confusion that has arisen, Victoria is now called the fruits of nutmeg strawberries.

If we talk about the most favorable place for planting strawberries, then these are flat areas of soil, well lit and at the same time closed from the wind. The plant does not like drought, but it does not tolerate stagnant water well. To get a good harvest, experienced gardeners recommend changing the planting site approximately every 3 years. It is best to plant berries after peas or early vegetables, but after cucumbers and onions, they are not advised.

Strawberries are usually planted in late summer or early autumn. You can also transfer strawberry seedlings to the soil in early spring, but this should not be delayed. The plant propagates thanks to the "antennae" - shoots emerging from the lateral buds. When leaves with adventitious roots form on them, they are carefully separated and transplanted. The best strawberry seedlings are obtained from two-year-old bushes. You can also grow planting material from strawberry seeds. First, they are mixed with wet sand, and a month later, when 1-2 leaves appear, the seedlings are transplanted into pots.

Strawberry care includes mandatory measures to remove weeds, as well as maintaining soil moisture. Before flowering, "rain watering" is allowed, but with the advent of flowers and berries, it is better not to allow water to come into contact with the ground part of the plant. In heavy rains, bushes are even

advised to cover with a film. In the spring, it is recommended to fertilize strawberries with mineral fertilizers.

Recently, planting strawberry bushes under agrofiber has become popular. This polypropylene material is non-toxic, breathable, protects the soil from drying out and waterlogging, excludes the contact of berries with the soil, which makes them clean and prevents the development of fungal diseases. Another equally popular way is to grow strawberries in PVC pipes (both horizontally and vertically). This method saves planting space, creates mobility (the pipe can be easily moved) and allows you to get a clean crop.

Moreover, now there are many ways to grow berries right in the apartments. In order for strawberries to take root on the balcony and not stop blooming, it is best to choose remontant varieties that can produce crops several times a season. It is also important to choose the right soil mixture (sand, humus, coniferous earth in equal amounts). It is recommended to plant strawberries in pots of at least 3 liters in volume.

By the way, now the Internet is actively advertising a set of miracle buttocks "Fabulous Collection" for year-round growing strawberries on the windowsill. Manufacturers offer to buy a complex consisting of seeds and specially prepared soil. According to them, the first harvest can be obtained within 3 weeks after planting, and in the future, the bush will bring up to 10 kg of berries. Judging by the reviews of people who have tried this "miracle set", the advertising description is absolutely untrue, and these homemade strawberries often do not produce a harvest not only after 3 weeks, but also after several months.

Strawberry varieties

Among the most popular varieties of remontant strawberries are the following:

- **Chamora turusi** - large fleshy berries of dark red color, rounded-comb shape. It tolerates cold well, but is unstable to drought.
- **Lorde** is a remontant frost-resistant variety that usually produces large berries that are bright red in color and round-conical in shape.
- **Albion** - cone-shaped berries of bright red color with a characteristic glossy sheen. A whimsical variety that does not tolerate extreme heat, is unstable to frost, and with an excess of moisture gives too watery berries.
- **Alba** - large berries of an elongated conical shape, characterized by special juiciness and sweet and sour taste. They tolerate drought and cold well, and are also suitable for transportation.
- **Giant** - large round-conical berries with a bright strawberry aroma. Refers to high-yielding varieties. Seedlings are relatively unpretentious, but like regular watering.

So, the importance of strawberries for the body is difficult to overestimate, because, in addition to a large dose of vitamin C, it contains many minerals and antioxidants. In addition, the berry is a dietary product that is suitable for diabetics and for those who simply follow their figure. Moreover, it is increasingly becoming the object of scientific research and, according to scientists, can be used to develop new drugs.

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Strawberry - useful properties, composition and contraindications

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



Beetroot (lat. *Beta vulgaris*)

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

Keywords: beetroot , useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

Main substances (g / 100 g):	Raw beets [1]
Water	87.58
Carbohydrates	9.56
Squirrels	1.61
Fats	0.17
Calories (kcal)	43
Minerals (mg/100 g):	
Potassium	325
Calcium	16
Phosphorus	40
Magnesium	23
Sodium	78
Vitamins (mg/100 g):	
Vitamin B4	6
Vitamin C	4.9

Vitamin B3	0.334
Vitamin B5	0.155
Vitamin E	0.04

Table beets contain sugars (sucrose, glucose, fructose), organic acids (oxalic, malic, citric), pectins (1.2%), protein (1.7%), betaine, carotene (0.01 mg%), ascorbic acid (5-15 mg%), vitamin B1 (0.02 mg%), vitamin B2 (0.04 mg%), dyes and compounds of potassium (288 mg%), magnesium (40-45 mg%), iron (1400 mcg / 100 g), copper (140 mcg / 100 g), vanadium, boron, iodine, manganese, cobalt, lithium, molybdenum, rubidium , fluorine and zinc. ^[four]

It should be noted that the carbohydrates contained in root crops are represented by sucrose (99%), glucose and fructose (1%). In beet tops, the content of carbohydrates is lower (from 3 to 5%), and they are represented by 3/4 glucose and fructose. This is facilitated by the presence of **invertase** in beet leaves , an enzyme that breaks down sucrose into fructose and glucose. Root vegetables do not contain this enzyme. Therefore, patients with diabetes are advised to include in their diet not root vegetables, but directly tops, since more insulin is required for the absorption of sucrose. The sugar content in beet roots is 6.76 g%, and in leaves - 0.5 g%.

Table beet leaves have a great medicinal potential compared to root crops: beet leaves contain more vitamin C, thiamine (vitamin B1), riboflavin (vitamin B2), pyridoxine (vitamin B6), vitamin A, vitamin E, vitamin K. The content of minerals in beet leaves are also higher compared to root crops. Thus, the root part of the beet is significantly inferior to the tops in terms of the amount of biologically active substances contained. ^[5]

Medicinal properties

The therapeutic value of table beets is due to the presence in it of numerous physiologically active substances in quantities that have a therapeutic and prophylactic effect. Beetroot juice has antispasmodic, diuretic and anti -sclerotic properties. Beetroot juice stimulates hematopoiesis , gastric secretion and intestinal motility, inhibits the development of microorganisms in the intestines, promotes cholesterol excretion, strengthens capillary walls, weakens vascular spasms, inhibits tumor growth, improves metabolism, has a beneficial effect on the function of the gonads, positively affects vision. There is information about the anti-inflammatory and wound-healing effect of beet juice. The use of beet juice is advisable for spastic colitis, atherosclerosis, thyrotoxicosis, arrhythmias, hypertension, liver diseases, intestinal atony, chronic constipation. Raw and pickled beets are an effective treatment for scurvy. ^[four]

In medicine

The pharmaceutical industry produces the drug acidin - pepsin (*Acidin-pepsinum*), which improves digestion. The remedy is prescribed for dyspepsia, hypoacid (with low acidity) and anacid gastritis.

In folk medicine

- With iron deficiency anemia, a mixture of juices of beets, radishes and carrots (in proportions 1: 1: 1) is taken three times a day, in a tablespoon.
- With hypertension, vasospasm, as a mild laxative and sedative, take beet juice with honey (in proportions 1: 1) or a combination of beet juice and cranberries (2: 1).
- For hypertension, drink fresh beetroot juice for 4 days, three times a day, a single dose of 200 ml.
- As a laxative, beet juice is recommended on an empty stomach (100 ml), boiled beet salad. ^[four]

- With atherosclerosis, raw beetroot juice, aged in the refrigerator for at least 2 hours, take one third of a glass half an hour before a meal.
- With hypertension, traditional healers advise tinctures. Tincture 1: mix 400 ml of beet juice, 250 g of flower honey, juice of one lemon, 100 ml of cranberry juice, a glass of vodka. Take tincture in a tablespoon three times a day one hour before meals. **Tincture 2** : combine 200 ml of carrot and beetroot juice and 100 ml of cranberry juice with 100 ml of alcohol and a glass of honey. Infuse the mixture in a dark place for 3 days. Drink a tablespoon three times a day.
- For cholelithiasis, a folk remedy is useful: peel, cut and cook a few beetroots for a long time until the broth thickens, to the state of syrup. Take this drug for a quarter cup three times a day before meals. The dissolution of stones in the gallbladder with prolonged use of such a decoction occurs gradually and relatively painlessly.
- In the treatment of malignant tumors, a traditional medicine is used: beetroot juice should be drunk at 600 ml per day at regular intervals (a single dose of 100 ml). It is better to drink juice on an empty stomach a quarter of an hour before a meal, slightly preheated. A serving of juice is eaten with a small slice of bread, sauerkraut. ^[6]
- For the prevention and treatment of vitamin deficiencies, pour 2 cups of boiling water over 2 tablespoons of finely grated beets, rose hips and black currants (one tablespoon each). Let it brew for 3 hours, then strain and add 2 teaspoons of honey. Drink an infusion of 50 ml twice a day one hour before meals. The course is at least 2 weeks.
- For arthritis, prepare a decoction of 400 ml of water, grated beets and chopped burdock roots (one tablespoon each). Boil the composition on low heat for a quarter of an hour, then strain. Drink the drug in a tablespoon 4 times a day 60 minutes before meals. The course is at least a week.
- For chronic constipation, the composition is useful: grate a large root crop and mix with 2 tablespoons of olive oil and a teaspoon of honey. Take in small amounts before each meal. ^[7]

OUTSIDE:

- To heal wounds, apply fresh beets, grated. The mass is changed as soon as it begins to dry out, fix it on the damaged area with a beet leaf.
- With a runny nose, beetroot juice is used (juice squeezed from boiled beets is used: cotton swabs are moistened and put into the nostrils).
- Pieces of raw root crops relieve toothache: they must be kept in the mouth, pressing against the aching tooth. ^[four]
- With a sore throat, grate fresh beets on a fine grater and squeeze the juice. Pour a tablespoon of table vinegar into 200 ml of juice. Gargle with this composition up to 6 times a day.
- With red spiral lichen, grated raw red beets are applied to the affected area. Beet mass should be changed when dry .
- With dry skin of the hands, prone to cracks, a bath is useful: pour the tops from 3 medium-sized root crops and boil over low heat for a quarter of an hour. Add honey to a slightly cooled broth (at the rate of a tablespoon per liter of broth). Steam your hands for 10 minutes. Then wipe and grease with a nourishing cream.
- Another recipe softens the skin of the hands: boil half of the medium beets and finely grate. Pour beetroot grated mass with hot decoction of beet leaves and let it brew for a quarter of an hour. Then strain, pour in kefir (a glass of kefir per liter of infusion) and immerse your hands with the composition for 15 minutes. Rinse with warm water and lubricate your hands with cream.
- A bath will help soften hardened skin on the soles of the feet: a small amount of soda is added to a decoction of beets, boiled together with tops. Soar legs for a quarter of an hour. Then wipe dry and moisturize with foot cream.

- Foot bath of beetroot leaves and nettle grass: take the components one by one, pour boiling water over it, let it brew. Keep your feet in the infusion for at least a quarter of an hour.
- Cracked heels are treated with the pulp of boiled beets. Grate the beets and add a little melted butter to it. Apply the mixture on the damaged part of the heels and hold for a quarter of an hour. Then rinse with warm water and rub well.
- With excessive sweating of the feet, a weak solution of potassium permanganate is prepared on the basis of a decoction of the leaves. The feet are immersed in a warm solution and take a bath for 10 minutes. Then rinse with hot water and wipe dry. ^[eight]
- With angina, grated beets and carrots (take a tablespoon), pour 200 water, boil for 5 minutes, then strain, add so much boiled water so that the initial volume is obtained, mix with a teaspoon of honey and gargle with this composition twice in knocks.
- For varicose veins, lotions are made with a decoction: boil beets, minced through a meat grinder, common oak bark and horse chestnut fruits (take a tablespoon of each ingredient) in 2 cups of water over low heat for 10 minutes. Let it brew for half an hour, strain. Moisten a clean cloth or gauze in a decoction and apply to the affected areas on the legs for a quarter of an hour. Lotions to do daily, once a day, for a week.
- With varicose veins, homemade tincture is also effective: grated beets, white acacia flowers and honey (only a tablespoon) are poured into a glass of vodka. Withstand tincture for 2 weeks in a dark place, sometimes shaking. After filtering and rubbing the legs every night before going to bed. The course of treatment is 7 days. ^[7]

in oriental medicine

Avicenna claimed that a decoction of beet leaves and beet juice heal cracks in the skin that appeared due to the cold. The healer attributed the ability to remove freckles to beet leaves. Avicenna used beetroot juice to treat warts, get rid of lice; a decoction of beets was used in therapeutic dressings applied to tumors; boiled beet tops healed burns. Avicenna described ear drops based on beetroot juice and a dandruff remedy.

Armenian scientist of the 15th century, healer Amirdovlat Amasiatsi attributed aphrodisiac properties to beets, the ability to heal tremors, epilepsy and neoplasms. ^[5]

In scientific research

At the beginning of the 20th century in Hungary, Dr. Sandor Ferenczi (a psychiatrist by profession and founder of the Hungarian Psychoanalytic Society) enthusiastically studied natural remedies that could be applied in the treatment of cancer. Ferenczi published the work "Red beetroot as an additional therapy in the treatment of patients with malignant tumors." The practical basis for the theory of the phenomenal healing properties of beetroot juice was the described cases of curing patients with cancer of the stomach, rectum, and bladder. Substances anthocyanins (among them betaine, from the group of polyphenols) are able to actively influence cancer cells. ^[9]

Beets can improve the professional performance of athletes: in 2012, a study conducted as part of the scientific activity « Journal of the Academy of Nutrition and Diabetics », showed an increase in running speed by 5% in the group of subjects in whose menu beets were included daily. In the last 1.8 km of the 5K marathon, the speed of these runners increased (compared to the so-called "placebo group"). ^[ten]

Antioxidant, anti-inflammatory, vascular-strengthening properties of beets and its components, the therapeutic effect of drinking beetroot juice are the object of research in modern medical works and articles (T. Clifford, G. Hovatson, D. West, E. Stevenson, R. Dominguez, E. Cuenca and etc.). ^[eleven]

Weight regulation

Beets are successfully used in dietary nutrition. The calorie content of 100 g of beets (raw root crop) is 43 kcal. In terms of iodine content, red beet occupies one of the leading positions among vegetables. This allows you to use beets for obesity, inhibition of pancreatic function - to activate metabolism.

Beetroot dietary dishes are included in the canonical nutrition systems of the American doctor W.-G. Heya ; Japanese scientist, Professor K. Nishi (aimed at general health improvement and weight loss).

In cooking

Table red beets are used to prepare traditional dishes: beetroot, borscht, vinaigrette. Beets are an indispensable ingredient in a variety of second courses, snacks and side dishes. Beets are marinated, stewed, stuffed (with meat, rice, mushrooms, cheese, vegetables) and baked in sour cream. Boiled beets are used in salads, for decorating appetizers and buffet menus.

Beetroot, combined with products of different categories, is good in all its flavor nuances: spicy Korean-style beetroot (with garlic, vinegar and spices), royal beetroot (with pickles), beetroot salad with prunes and nuts that has become a classic. Add raisins, apples to beets.

In cooking, both root crops and beet leaves - tops are used. It is used to prepare botvinya (cold kvass soup made from boiled and grated beet tops with the addition of sorrel and herbs), salads.

Recipe for beet tops salad: chop young beet leaves (60 g, about 2 handfuls), salt to taste. Prepare a dressing of lemon or cranberry juice (a tablespoon), vegetable oil (a teaspoon), chopped green onions and mustard to taste. Thoroughly mix the ingredients and season the salad.

How to cook beetroot?

- Beets are not recommended to be boiled in salt water - they will be tasteless and less nutritious. Before the end of cooking, you can add a piece of sugar.
- When storing beets in the air in a purified form, a significant amount of vitamin C is lost.
- Oven-baked beets are healthier and tastier than boiled beets and are recommended for salads and vinaigrettes.
- You need to cook beets so that the water covers the root crop by no more than one centimeter.
- Before you mix the vegetables for the vinaigrette, you need to separately season the beets with vegetable oil, mix thoroughly and only then add other ingredients, so the rest of the vegetables will retain their natural color.
- Beetroot in the microwave is a "faster" and more convenient option for cooking beets, since this vegetable needs to be cooked for a long time. In the microwave, washed and unpeeled beets, laid out in a baking sleeve with holes pierced in it, are cooked at a higher power for only about 10 minutes.
- In order for borscht to acquire a bright red beet color, the beets must be boiled whole, then grated, sprinkled with citric acid (on the tip of a knife) and granulated sugar, mix well and let stand. After that, put in borscht and let it boil once. ^[12]

Beverages

Cranberries, red currants, apples, honey are added to drinks based on beetroot juice. Prepared from beets and kvass. **To prepare beet kvass you will need:** 400 g of beets, 1.2 liters of water, sugar - to taste. Wash the beetroot, peel it, cut it into circles, put it in an enameled or glass pan, alternating layers of beetroot sliced into circles with beetroot cut into halves or quarters. Pour beets with chilled boiled

water, add sugar. Cover the pan with gauze and insist in a warm place for 5-6 days. To speed up the fermentation process, you can add a crust of rye bread. Then cool kvass and keep in the refrigerator. Use as an independent drink or for making cold summer soups, okroshka.

In cosmetology

In home cosmetics, fresh beet roots are used. Cosmetic recipes for any skin type:

To improve the complexion, wipe the neck and face with a slice of fresh beetroot, allow the juice to dry, then apply a thin layer of cream to the skin, gently tapping it with your fingertips.

Beetroot mask: grate raw beets on a fine grater and mix with sour cream (1:1), apply on face, let dry, rinse thoroughly with warm water.

Refreshing beetroot mask: grate fresh beets on a fine grater, mix the beetroot mass with sour cream and egg yolk (take a teaspoon in total). Apply to the face, keep the mask for half an hour and rinse with warm water. ^[12]

Beetroot lotions for different skin types

Lotion for dry skin (to prepare it, use water in which beets were boiled): mix half a glass of cooled beetroot broth with 100 ml of milk, one yolk and 3 tablespoons of medical alcohol diluted with water in proportions 1: 1. With the finished lotion, wipe the face with light movements using a cotton pad. Keep the lotion in the refrigerator for a short time.

Lotion for oily skin : prepare an infusion of beet tops and calendula flowers (take just one part each). Steam the plants with boiling water and let it brew. Add the juice of one lemon and 3 tablespoons of alcohol to the herbal infusion.

Lotions for normal skin

Option 1

Prepare an infusion of beet leaves, mint and chamomile herbs (1:1:1): pour boiling water and let it brew. Add 2 egg yolks and 3 tablespoons of vodka.

Option 2

Boil a quarter of one medium beet and grate it on a coarse grater. Steam the beet mass with 200 ml of a strong infusion of beet tops, cool and combine with 2 tablespoons of alcohol, a spoonful of honey and one yolk. ^[eight]

Beetroot water for hair: Rinsing the hair with beetroot water is used for dandruff. To prepare beetroot infusion, a three-liter container is filled with 1.5 liters of cold water. Raw beets chopped into slices are put into it in such an amount that the water level rises almost to the brim. Beetroot infusion is kept in a dark place for 6 days, until green mold appears on the surface. The water is carefully filtered and used to rinse the hair after washing, diluting the infusion with hot water. ^[12]

To cleanse the body

The liver and intestines clogged with toxins helps to cleanse beet kvass. Such cleaning is considered quite mild, it is relatively easily tolerated by the body. Beet or beet-bread kvass not only removes toxins, but also cracks down on pathogenic microorganisms in the intestines.

With diseases of the kidneys, bladder, urolithiasis, this cleaning method is contraindicated.

Dangerous properties of beets and contraindications

It is contraindicated to use beets in large quantities for nephrolithiasis (primarily with oxaluria) and other metabolic disorders. ^[four]

Beets contain a lot of sugar and excessive consumption of them in raw form can provoke an increase in blood sugar levels. Beets for type 2 diabetes are allowed boiled in quantities agreed with the attending physician.

Treatment with fresh juice from raw beets is contraindicated in gastritis with high acidity (hyperacid gastritis), low blood pressure, glomerulonephritis , diarrhea, nephrotic syndrome, osteoporosis, inflammatory processes in the gastrointestinal tract (acute stage), chronic renal failure and nephrolithiasis, ulcer stomach and duodenum (in the acute stage).

It is highly undesirable to take beetroot juice freshly squeezed , therapy with only settled juice (which has been kept for at least 3 hours) is advisable. Fresh beetroot juice can cause vasospasm, sharply lower blood pressure, with accompanying symptoms in the form of mild nausea and general weakness. ^[7]

Excessive consumption of beets is contraindicated in patients suffering from hemochromatosis and Wilson's disease (this is due to the possible accumulation of copper and iron in the body). ^[fourteen]

Interesting Facts

- Beet seeds retain their ability to germinate for 6-10 years.
- Hippocrates described at least 10 recipes for the use of table beets in folk medicine.
- For the first time the term “ Beta rubra ” (“red beetroot”) appears in the 3rd c. BC. in the texts of Priscian .
- The rounded form of the root crop, which is known to the modern consumer, did not always have beets: up to the 16-17th centuries, elongated and thin beets were grown in Europe, which rather resembled large carrots.
- In some cultures, there is a belief that a man and a woman who taste a piece of one cooked root vegetable in the form of a dish will surely fall in love with each other.
- Beets can rightly be called a winning vegetable. After they learned how to preserve it in Russia, ferment it in brine - harvest it for future use, gradually and confidently, beets displaced their main competitors in the south and in the middle lane: turnips, turnips and rutabaga.
- Botvinya is one of the most expensive, festive and "complicated" first cold dishes in the history of Russian cuisine, although a simpler and cheaper version of this soup is common in modern cooking. Traditionally, the so-called “full” botvinya included 3 obligatory components: 1) directly botvinya (soup), 2) boiled red fish (sturgeon, salmon or stellate sturgeon), which was served separately with the soup, 3) crushed ice in a separate container.
- Beetroot is one of the symbolic products accompanying the Jewish holiday Rosh Hashanah . Eating a small amount of it at the festive table, they say traditional prayer words in which they ask to save in the future from any opponents to the cause or thoughts.
- In Australia, pickled beets are added to hamburgers. ^[13]

Selection and storage

When buying, you need to choose round or flat-round dark-colored root crops: they are more juicy and superior in taste to elongated beets. A fresh healthy root crop is hard, dense, weighty, with maroon, red or white-red flesh. For borscht, dark red beets are preferable, lighter beets are put in vinaigrette, any salad is used for salad, and it is better to ferment burgundy beets. Ripe root crops have a thin tail, while unripe ones have a thick tail.

Root crops without tops are stored in plastic bags in special compartments of a household refrigerator. On a larger scale, beets are stored in boxes or directly on the floor in basements, covered with sand.

Beet roots are best preserved at an air humidity of 80% and a temperature of 2-3 degrees Celsius (in bags made of very dense polyethylene). If the beets are stored in wooden crates, the humidity should be 90% and the storage temperature between 0 and 1 degrees. In the cellars, root crops can be laid out in the form of a round pyramid, pouring sand over each layer. Do not store beets mixed with other vegetables (potatoes are an exception), this leads to mold. ^[eight]

Beet is a world-famous vegetable, industrial and fodder crop, which is also a low-calorie product that stands out among other vegetable plants with a high level of sugars contained in it and a relatively high level of carbohydrates. Beets are rich in antioxidants, have exceptional nutritional value and, due to their properties, are invaluable in terms of medical and dietary nutrition.

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Beet - useful properties, composition and contraindications

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Raspberry

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

Keywords: raspberries, useful properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

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

Main substances (g / 100 g):	Fresh raspberries [1]	Frozen Sugar Free Raspberries [2]	Raspberries preserved in sweet syrup [3]
Water	85.75	85 , 01	75.33
Carbohydrates	11.94	12.55	23.36
Alimentary fiber	6.5	4.3	3.3
Sugar	4.42	6.54	20.06

Squirrels	1.2	1 , 15	0.83
Fats	0.65	0.81 _ _	0.12
Calories (kcal)	52	56	91
Minerals (mg/100 g):			
Potassium	151	184	94
Phosphorus	29	thirty	9
Calcium	25	24	eleven
Magnesium	22	23	12
Sodium	one	four	3
Iron	0.69	0.76	0.42
Zinc	0.42	0.31	0.16
Vitamins (mg/100 g):			
Vitamin C	26.2	17.6	8.7
Vitamin E	0.87	0.75	0.59
Vitamin PP	0.598	0.675	0.443
Vitamin B6	0.055	0.062	0.042
Vitamin B2	0.038	0.100	0.031
Vitamin B1	0.032	0.089	0.020
Vitamin A	0.010	0.022	0.010

If we compare the amount of nutrients in fresh and frozen fruits, the difference in vitamins is not so significant, and the concentration of most minerals even increases. However, in canned raspberries, the “usefulness” indicators drop sharply, so it’s not necessary to talk about the healing role of raspberry jam.

The amount of useful substances in raspberries is affected by belonging to a certain variety and growing conditions, but a set of valuable biologically active substances is present to some extent in all varieties. Of the mineral compounds in raspberries, there is a relatively large amount of iron, zinc, copper, an average amount of manganese (up to 210 mg per 100 grams of raw product). The seeds contain fatty oil (according to various sources, up to 14-22%) and about 0.7% phytosterol .

Raspberries are also known for their high content of vitamin C, the concentration of which can increase even more with a decrease in the temperature of the growing season. **Salicylic acid** occupies a special place in the list of organic acids , thanks to which raspberries have numerous medicinal properties that have helped a person maintain health since ancient times.

Medicinal properties

One of the key qualities of raspberries is their antioxidant activity. The complex effect of a number of adverse factors (from electromagnetic and ultraviolet radiation to radioactive and toxic pollution) leads to an excess of free radicals in the body and the oxidation of macromolecules, which upsets the balance of the natural antioxidant system and leads to the destruction of body cells. Foods with high antioxidant activity, such as raspberries, restore this balance.

The main natural antioxidants are flavonoids , phenolic compounds, anthocyanins, vitamins C and E, carotenoids , etc. are present in all varieties of raspberries, but in different proportions. The highest antioxidant activity among Eastern European varieties is distinguished by "Hercules", "Eurasia", "Golden Autumn", "Ruby Necklace".

Vitamin C is the most important natural antioxidant, but this is not the only reason for its importance. The name of the synthetic analogue - "ascorbic acid" contains a direct indication of the relationship

between vitamin C deficiency and scurvy (" scorbutus " - in Latin "scurvy"). In addition, this substance is necessary for the normal functioning of connective and bone tissue. With regard to raspberries, this is important, because one serving of berries contains approximately 25-35% of the daily intake of vitamin C.

P-active compounds belonging to the group of substances of phenolic origin, in addition to resistance to free radicals, affect the elasticity and permeability of capillaries, promote the elimination of toxins. Manganese - another element in the complex protection against free radicals - in the composition of enzymes is also responsible for protein synthesis. Magnesium plays an important role in the functioning of the heart muscle and, in general, in the work of the cardiovascular and nervous systems. Vitamin K is essential for normal blood clotting.

These and other useful substances create the prerequisites for the manifestation of numerous medicinal properties of raspberries: bactericidal, diaphoretic, painkillers. The antipyretic effect of eating raw raspberries is relatively weak, but thanks to salicylic acid, it can also be present.

Fresh berries effectively quench thirst and activate digestion. The fruits owe their smell to raspberry ketone, which increases the secretion of gastric juice, bile, saliva and, in general, stimulates appetite. Often the fruits are used as a sobering agent.

According to some reports, the use of raspberry ellagitannins (esters of ellagic acid and sugars) at a dosage of 40 mg per day can prevent the development of cancer cells by slowing down their growth or destruction (at a high concentration of ellagitannins). Ellagic acid also has the ability to lower blood pressure.

Use in medicine

Raspberry entered the State Pharmacopoeia (a collection of standards that determine the quality of medicinal substances) in 1952, but only a small part of the plant's potential is directly used in scientific medicine. The syrup, created on the basis of raspberry fruits, is part of the mixtures as a sweetener. And compounds resulting from the biosynthesis of salicylic acid are used in ointments and powders in the treatment of skin diseases.

At the same time, raspberry is extremely widely used in folk medicine. Moreover, every corner of the world has its own special traditions of its application.

Use in traditional medicine

In ancient times, healers believed that condensed raspberry juice helps to soothe bile fever and get rid of gall lichen, with urticaria and rubella - gruel from ground leaves applied to a skin rash, and with leprosy - a decoction of shrub roots. The same decoction, if drunk, was supposed to help with wet ulcers, lichen, relieve itching and spots on the skin.

Modern folk medicine also uses not only raspberries, but also leaves, flowers, young shoots and roots as raw materials for medicines. Indications for use are various diseases:

- **Diseases of the respiratory tract** (where raspberry acts as a diaphoretic, antipyretic and expectorant). Folk doctors prescribe both raw fruits, and tea based on raspberry leaves, and a drink from brewed raspberry shoots. To prepare such a medicine, the cuttings are dried, crushed (ground), and then brewed like tea for about 3 minutes, pouring 1 spoonful of powder with 2 cups of hot water.

- **Diarrhea, diarrhoea, dysentery** . For these diseases, a decoction of raspberry branches (three times a day, 1 glass each), an infusion of leaves and branches (as an astringent), tea from dried berries is recommended.
- **Skin diseases** : inflammation, acne. For treatment, a warm infusion of raspberry flowers or leaves is used (in a ratio of one to twenty). A swab moistened with the prepared liquid is applied three times to the affected area with an interval of several minutes. The course includes 20 procedures, and the first 10 cycles are carried out daily, and the remaining 10 - every other day. In addition, an ointment from the juice of leaves and butter is used in the treatment, as well as an infusion of leaves in olive oil.
- **Vascular and blood diseases** . For inflammation of the hemorrhoidal veins, a decoction of raspberry roots or flowers is used. With hemorrhages - a decoction of the leaves. Also, raspberry leaves in decoctions and infusions are used by folk doctors as an anti -sclerotic agent that improves the condition of blood vessels.
- **Reproductive disorders** . As the main component, raspberry is included in the fees that help men with sexual impotence, and women with infertility. East Slavic healers gave women a decoction of raspberry roots or flowers with excessive and atypical discharge from the genitals (leucorrhoea).

In folk medicine, there are certain traditions, due to the specifics of a particular region. Historically, Ukrainian healers used raspberry berries, leaves and flowers for rheumatic pains and fever, Czech healers treated gastrointestinal disorders with raspberries, and Belarusian healers treated colds.

Decoctions

In decoctions, branches and leaves are most often used, less often - flowers and roots of a raspberry bush. The resulting remedy, due to the expectorant effect, is recommended for use in the treatment of cough, bronchitis, laryngitis, asthma, and due to its astringent properties - for diarrhea, inflammation of the intestine, hemorrhoids.

So, for example, to prepare a decoction of raspberry branches, the washed stems are first poured with boiling water, and then kept on low heat for about an hour until the water acquires a reddish tint. Apply a decoction in a cooled form. The finished product is not stored for a long time. Even in the refrigerator it is kept for no more than a day.

There is another way to prepare decoctions, when the washed branches or leaves are first boiled (usually about 10 minutes), and then kept in cooling water for another 0.5-1 hour. A similar method is most often used when creating a decoction of berries and flowers. In this case, raspberries are taken in the proportion of 30 berries per glass of water, and flowers - 20 grams per glass (200 ml).

Before the advent of hair dyes, a decoction of raspberry leaves with potash was used to dye hair dark. Now in its pure form, such a decoction is more often rinsed with hair after washing to stimulate growth and strengthen them.

infusions

In home treatment, infusions on raspberry fruits, leaves, flowers and stems are popular.

- **Infusion on berries.** 200 grams of dried fruits insist for half an hour in 0.5 liters of boiling water. It is recommended to drink 2 glasses for 1-2 hours for colds.
- **Infusion on flowers.** 20 grams of flowers are poured with a glass of boiling water (200 ml), kept for half an hour and filtered. Take liquid 1 tablespoon three times a day for colds and coughs. The same infusion is externally prescribed for erysipelas, acne.

- **Leaf infusion** . 4 teaspoons of the leaves of the plant are crushed and poured with 2 cups of boiling water. After straining, it is taken ½ cup 4 times a day as an anti-inflammatory and astringent for gastritis and enteritis.
- **Stem infusion** . Fresh raspberry stalks, either peeled from leaves or directly with leaves, are washed and cut into pieces, after which they are lowered into a jar and poured with vodka in an approximate ratio of 1:5. Such an alcohol infusion is prescribed by traditional healers to restore reproductive function.

in oriental medicine

Depending on one or another Eastern tradition, healers "prescribed" fruits or plant parts of raspberries for various types of diseases:

- Traditional Chinese medicine recommended raspberries for eye diseases (redness, inflammation and even blindness), toothache, to remove uric acid and stimulate urination. The leaves of the plant were used as a hemostatic agent, and the fruits were recommended to improve digestion.
- In Korean folk recipes, raspberries, along with lemongrass, psyllium and dodder seeds, and tribulus flowers, are mentioned as an ingredient in fertility drugs. With male impotence, Korean healers also offered to fight with raspberry-based products. To do this, the fruits were first soaked in vodka, and then dried over low heat and ground in a mortar. The resulting powder, washed down with water, was taken in the morning in a volume that approximately corresponded to the volume of a heaped tablespoon.
- In Tibetan medicine, the leaves and young shoots of the plant were used to treat acute and chronic infectious diseases, neurasthenia, inflammation of the peripheral nerves (neuritis). It was believed that raspberries "heals Wind, Heat, and at the same time Wind and Heat." Raspberries (Kentakari) were used for lung diseases. It was assumed that by its effect on the body, it should "bring the infectious fever to maturity".
- In the Transcaucasus, a tincture of flowers was used as an antidote for the bites of poisonous insects and snakes, and an aqueous extract of the leaves was used as a potion that had a stimulating effect on the central nervous system.
- The peoples of the Trans-Baikal Territory treated diseases of the nerves with raspberry fruits, leaves and stems.

In scientific research

To date, research on raspberry-based preparations is being conducted either in rodents or in vitro - that is, in a test tube, "in glass", outside a living organism. Scientists are experimenting mainly with two main groups of polyphenols found in raspberries: ellagitannins (the main breakdown product of which is ellagic acid) and anthocyanins.

The ability of raspberry extracts and its individual purified components to prevent oxidative processes in body cells was tested "in vitro" using various biochemical markers of oxidative stress. The results of the experiments confirmed the effectiveness of this approach and a decrease in the level of oxidative stress, which, without therapeutic measures, provokes inflammatory processes in the body and leads to a number of serious diseases. ^[4] .

In laboratory animals, the effect of raspberry extract on inflammation caused by oxidative stress has been tested in several experiments. Thus, in collagen-induced arthritis in rats, raspberry extract (at the rate of 15 mg/kg) significantly slowed down the development of clinical symptoms of the disease, inhibited the intensity of bone tissue destruction, reduced soft tissue edema, and reduced the rate of osteophytes (bone outgrowths) appearance ^[5] . In another experimental model, rodents were first

provoked to develop gastritis and then given ellagitannins . As a result, not only inflammation was reduced, but also antioxidant enzymes of the body were activated ^[6] .

Oxidation also has a destructive effect on the endothelium - a mono-layer of cells lining the inner surface of the cavities of the heart, blood and lymphatic vessels. The endothelium does not just "polish" the vessels from the inside. It synthesizes many biologically active substances and exhibits high endocrine activity. Its damage leads to arterial hypertension (high blood pressure syndrome), atherosclerosis and the occurrence of many cardiovascular diseases.

Research carried out in vitro " on individual cells have shown that both the berry itself and the raspberry extract have a positive effect on the functioning of the endothelium, preventing the risk of developing hypertension and atherosclerosis ^[7] . In another animal experiment, rats were divided into 2 groups according to the results of observation: the first included healthy rodents with normal pressure, the second - animals with high blood pressure syndrome. Within 5 weeks, rats from both groups were given 100 and 200 mg of raspberry extract, respectively, resulting in a pronounced antihypertensive effect ^[8] .

On rodents (hamsters and rabbits), scientists also tested the possibility of inhibiting atherosclerosis using products from raspberry raw materials. So, for 12 days, hamsters were introduced to the diet with raspberry juice, due to which a decrease in the level of triglycerides (the so-called "bad" fats) was noted. At the same time, it turned out that it was possible to reduce cholesterol levels only with the help of the juice of a certain variety of raspberries. In a study, such a therapeutic effect was found in the Cardinal variety ^[9] .

In New Zealand, white rabbits were put on a high-fat, high-cholesterol diet and then fed ellagic acid (1% of the diet). By the end of the experiment, the levels of fats in the plasma and aorta decreased significantly in animals, and the accumulation of cholesterol in the thoracic aorta also slowed down ^[10] .

Weight regulation

The calorie content of fresh berries in various sources is estimated differently, but in most cases it is indicated at the level of 41-42 kcal per 100 g, which classifies raspberries as a group of low-calorie foods. This allows it to be widely used both in author's diets and in the bakery industry in dried form to reduce the energy value of the dough while increasing its palatability.

For the preparation of raspberry flour, not only ripe, but also just beginning to ripen fruits are suitable. Peeled raspberries are dried in the sun and laid out on sieves with a layer of no more than 3 cm. Then the berries are sent to the oven, where, if dried properly, they become grayish-red in color and do not leave marks on the hands when sorted out. Blackened berries are discarded. A sign of the correct conduct of the process is also the preservation of the raspberry smell.

Dried and sorted berries are ground into flour and added to the dough. Flour products with reduced energy value obtained from such a test are in demand among overweight people who are unable to completely give up sweets. At the same time, fiber, minerals, anti-sclerotic substances are preserved in the flour obtained after processing.

Some research in progress suggests that raspberry ketones increase enzyme activity, speeding up the energy-yielding metabolic process. This, in turn, leads to poor absorption of fats and may contribute to weight loss.

The idea of compensating the high-calorie components of diets with raspberries was expressed by a nutritionist from the USA Elsa Savage . She suggested replacing not only flour products with raspberries or blueberries, but also fruits, which, if consumed in excess, can easily neutralize the effect of a weight loss program (grapes, bananas, mangoes, etc.).

In cooking

Raspberries are a common component in compotes, jelly, jams and marmalades. It is used to make jelly, marshmallow, marmalade, and is widely used as a filling for baking and as a filling for desserts.

Ideally, raspberries are combined with cottage cheese, cream, milk, ice cream. But she “got accustomed” well in recipes not only for sweet desserts. Meat dishes are seasoned with raspberry sauces, and salads are seasoned with fragrant raspberry vinegar.

Raspberry red wine sauce can be prepared according to the following recipe:

1. The berry (at the rate of ¼ kg) is moved, separated from the stalks and washed. (To easily remove insects, the fruits are poured with cool water and then the floating insects are collected from the surface).
2. Black peppercorns (5 pcs.) are crushed (coarse grinding is preferred).
3. Raspberries are poured into a saucepan, where 100 grams of sugar and 100 ml of dry red wine are added.
4. Cook the mixture over low heat for about 15 minutes until the sugar is completely dissolved.
5. Chilled raspberries are ground through a sieve, after which ground pepper is added to the sauce.

There are recipes for spicy sauces based on white wine with the addition of lemon zest, red pepper, ginger, cloves, cinnamon. Also in cooking, recipes for various raspberry liqueurs and vodkas are widespread. The berry gives alcohol its taste, smell and color very well. To prepare raspberry alcoholic drinks, it is usually necessary to infuse raspberries on vodka or brandy for 1-2 weeks at room temperature. And even a frozen berry will do.

In cosmetology

Raspberry is a product that can have a beneficial effect on the condition of the skin both from the inside and outside.

Raspberry berries are part of the anti-aging diet of the famous US dermatologist Nicholas Perricone . His food system " Face Lift diet ":

- on the one hand, it is aimed at combating the action of free radicals by “neutralizing” them with the help of products containing antioxidants;
- on the other hand, on exclusion from the diet of products that cause the formation of free radicals.

a balanced diet, Dr. Perricone fights eczema, psoriasis, dermatitis and early wrinkles.

At home, fresh raspberry leaves are also used to combat acne. To do this, they are ground in a mortar until a homogeneous slurry is formed, which is applied to problem areas for 15-20 minutes, after which it is washed off with warm water and dried with patting movements of the fingers.

To nourish and cleanse the skin at home, you can make raspberry lotion. When preparing it, a tablespoon of berries is kneaded and poured with 300 g of vodka, allowing the composition to brew for 10 days in a dark place at room temperature. Before use, the lotion is half or 2/3 diluted with water.

Raspberry ketone has recently become a popular cosmetic ingredient. It is sold in different packages (usually from 5 g to 1 kg) in the form of a white crystalline powder, highly soluble in alcohol, hot oil, squalane, propylene glycol, triglycerides. The cosmetic advantage of raspberry ketone is that, due to its fat-burning properties, it effectively improves skin tone, improves its elasticity and eliminates sagging.

In facial cosmetics, raspberry ketone helps to narrow pores, activate metabolic processes, which ultimately creates a rejuvenating effect. In hair care products, this ingredient helps both strengthen hair loss and stimulate new hair growth. Thus, as part of various formulations, raspberry ketone solves a whole range of problems, including:

- smoothing and tightening of the skin;
- rejuvenation and leveling of the microrelief;
- baldness prevention;
- fight against cellulite;
- fat burning;
- increased metabolism.

The share of raspberry ketone in the composition of cosmetics, as a rule, accounts for no more than 1-2%:

- Cosmetics for facial skin - up to 0.5%;
- Hair cosmetics: shampoos - up to 2%, hair loss products - 0.02%;
- Gels to strengthen eyelashes and enhance their growth - 0.01%;
- Anti-cellulite serums and wraps - 1%.

Raspberry ketone does not dissolve very well in water, so home cosmetics are usually prepared on the basis of alcohol, introducing the component in the final phase of preparation of the product. When combining raspberry ketone with oils, it is added at the stage of the fatty phase, after which it is heated until completely dissolved (melting at a temperature of 80-85°C).

Dangerous properties of raspberries and contraindications

Eating raspberries in large quantities can harm people suffering from gout, having problems with the gallbladder, kidneys. The reason for this is **calcium oxalates contained in the berry**, potentially capable of provoking an exacerbation of diseases.

The results of some studies have suggested a connection between the use of decoctions and infusions of raspberry branches with inhibition of the function of the thyroid gland and pituitary gland. The appearance of the effect is explained by the likely presence of substances with a hormonal effect in the composition.

Due to the presence of coarse fibers in raspberries, its use should be refrained from during periods of exacerbation of gastritis, peptic ulcer of the stomach and duodenum. And given the content of vitamin K in raspberries, which affects blood clotting, people taking anti-clotting medications should consult their doctor before consuming raspberries.

Often, the danger is created not so much by the product itself, but by distorted ideas about its properties. So, for example, in online cosmetic publications, it was widely believed that raspberry seed oil provides protection from sunlight at an SPF level of 28 to 50. An attempt to identify the source of this information led to an article in the Journal of food Chemistry ", released in 2000. It said that similar results were obtained by a team of researchers consisting of Canadian, French and Chinese scientists. However, it was not indicated anywhere exactly how the researchers came to such conclusions and what activities were carried out to detect the effect.

Doubts about the correctness of the study were raised by several points:

- Firstly, a very large range of SPF was announced without explaining the reasons for the difference in performance.
- Secondly, the data presented contradicted other studies (American and Indian scientists from the University of Florida and Ravishankar Shukla University , respectively), which stated that the SPF of most popular natural oils is approximately unity - SPF 1. (The record holder in the study was peppermint oil with SPF 7).

Thus, if you apply raspberry seed oil before going to the beach, then there is a direct danger of sunburn - natural oils do little to prevent the penetration of UVB rays. In addition, they do not block UVA rays at all - more dangerous long ultraviolet waves, the harm from which is not immediately noticeable.

Not able to stop ultraviolet and vitamin E contained in raspberries (although it is also often attributed to the filter function). As an antioxidant in combination with molecule-stabilizing vitamin C, vitamin E can correct the effects of sun exposure, but this requires the oil to be unrefined.

In addition, pure vegetable oils have low water resistance and do not adhere well as a barrier, being quickly absorbed by the skin. Therefore, if there is no harm from the product, but it still does not cope with the protective function that is assigned to it, then this also creates additional risks.

Interesting Facts

Raspberries have been written and spoken about since ancient times. The mention of berries appears in one of the versions of the ancient Greek myth about the infancy of Zeus. They tried to hide the future Olympic supreme god from the bloodthirsty father of Kronos, who wanted to destroy his heirs, who, according to the prediction, were to overthrow him. So that the baby would not betray his location with a cry, one of the nymphs decided to distract him by treating him to raspberries. But while picking berries, she hurt her hand on the thorns, because of which they turned the color of blood.

And indeed the Latin name for raspberries is *Rubus . idaeus* - probably comes from the word " *rufus* ", meaning a bright red color. However, in fact, the fruits of various varieties can be almost white, and yellow, and pink, and even black.

In wildlife, everything is generally very confusing. For example, raspberry flavor may not be limited to raspberries. Red bananas differ from the usual yellow ones not only in their increased content of potassium, vitamin C and beta-carotene, but also in a special flavor reminiscent of raspberry. The fruits of the "chocolate liana" - akebia , have the same feature, although its name contains a hint of the smell of chocolate, which can be felt when next to the plant.

Names are often misleading. In East Asia, a small tree of the mulberry family is common - *Kudrania triacicular* . But besides this name, he has one more thing - "raspberry tree". Although the taste of the fruits of this tree is more reminiscent of persimmons, outwardly a clear resemblance to the fruits of raspberries is caught.

The higher the economic and traditional nutritional importance of any product in the national economy of the country, the more often this product is mentioned in folklore and author's work. So, among the Eastern Slavs in fairy tales, raspberries are mentioned more often than any other berry, and its image is associated with a sweet carefree life, which is reflected in proverbs and sayings (for example, "Not life, but raspberries"). It is not surprising that in Russia, which ranks first in the industrial cultivation of this berry, Ivan Larionov's song of 1860 "Kalinka-Malinka" has long been considered a folk song.

In the Serbian city of Arilje, located in a picturesque hilly area, a monument to a raspberry picker was erected. The place was not chosen by chance. The city itself is often called the raspberry capital of the world, since the surrounding plantations harvest a fifth of the entire crop of Serbia, which is approximately 5% of the global crop of the product. Millions of kilograms of berries pass through thousands of small factories every year.

Raspberries are considered the main export product of the country and a kind of recognizable brand that is popular all over the world. In Serbia itself, it is poetically called "red gold", and since 2012, festive events have been held under the general name "Raspberry Days".

Since 2018, a monument to raspberries, made by a local sculptor, has been in the Ukrainian village of Sadovoye, Tokmak district, Zaporozhye region. Its opening took place at the "Festival of Happy Berries", and the appearance is associated with the vigorous activity of an agricultural cooperative engaged in the cultivation of this horticultural crop.

But, perhaps, the world's most famous "sculptural" image of a berry was created for the presentation of the Hollywood anti-prize for dubious achievements in the field of cinema "Golden Raspberry". The statuette, which is awarded to the most distinguished actors, directors, screenwriters and other filmmakers, is intentionally made of cheap plastic and covered with deliberately bright yellow paint from a spray gun.

It is believed that the name of the anti-award "Golden Raspberry" comes from the slang expression common in English-speaking countries "to blow raspberry (tongue)" describing a specific way of expressing disdain to another person. (For the manifestation of mockery, you need to blow with a slightly sticking out tongue and closed lips).

The Golden Raspberry Award has been awarded since 1981 on the eve of the announcement of the list of Oscar nominees and has become very popular among viewers and critics over the years of its existence. However, not only in the world of cinema, but also in real life, there are varieties that, thanks to their orange-yellow berries, could become a model for the authors of the statuette.

Selection and storage

Raspberries are chosen, first of all, focusing on its appearance. In the absence of obvious damage on the surface of the drupe, it is better to buy elastic raspberries, which have a uniform saturated color. Sluggish, darkened, crumpled, moldy berries should be discarded.

Since raspberries in the markets today are most often sold in transparent plastic cups, the buyer has the opportunity to examine the contents of this container more carefully, which is very convenient. Through the transparent walls of the glass, you can see low-quality berries, which the seller sometimes puts on the bottom, disguising them as fresh. In addition, the buyer immediately notices if the raspberries have been in the glass for a long time and have already released the juice.

Dried berries should also be discarded. The shelf life of raspberries taken from the bush in its natural form is very short. It is advisable to eat or freeze the fruits within the first day after harvest.

When properly frozen, raspberries can be stored until next year's harvest, while retaining their beneficial properties. "Correct" is freezing in several stages, in which the berries are first washed in a colander under a weak stream of water so as not to damage the soft flesh, then dried on a paper towel, and finally laid out in one layer on a baking sheet (tray), which is sent into the freezer. Only after the berries are frozen and hardened, they can be poured into a hermetically sealed bag and sent to the freezer for long-term storage.

With this method, they do not form a frozen lump, do not lose their appearance, and take up little space in the refrigerator. For a very long time, raspberries can also be stored in the form of jam. But it is incorrect to compare these two methods, because after repeated heat treatment, raspberries lose almost all useful properties.

One of the most recent ways to preserve most of the nutrients in berries has been the vacuum freeze-drying of previously frozen fruits. From the open (domestic) drying method, this one differs in the absence of raspberry contact with oxidizing oxygen. The advantage of the method is in preserving the taste, aroma, color and shape of the berries. Minus - in the partial loss of anthocyanins and a slight loss of ascorbic acid.

Varieties and cultivation

The first varieties of raspberries began to appear from the 16th century. All of them originated from plants brought from the forest. To date, there are more than 600 varieties, but there is an opinion that many of them are inferior to the forest progenitor in terms of the content of nutrients in fruits. Nevertheless, breeders have something to be proud of.

- Firstly, a number of varieties are distinguished by both excellent taste and attractive presentation, as well as a high content of anthocyanins, vitamins, and phenolic substances.
- Secondly, many remontant varieties have been bred, which are characterized by the ability to bear fruit on both annual and biennial shoots, which increases productivity. The first such varieties appeared more than 200 years ago, and by the end of the 20th century their number exceeded fifty.

Below, for example, species are described that are distinguished by their commercial identity and / or high antioxidant activity:

1. "Eurasia". Remontant unpretentious variety of early ripening with dense large (4-4.2 g) sweet and sour fruits appeared in 1994. The berries are recognizable by their conical shape, dark raspberry color and matte surface of the skin. The fruits are not very fragrant, but this raspberry has high levels of antioxidant activity: anthocyanins - 149.6 mg / 100 g, P-active compounds - 326 mg / 100 g.
2. "Hercules". Another remontant variety with large, but not very sweet and fragrant fruits. "Hercules" compensates for this shortcoming by the fact that it is one of the record holders for C- vitaminity with indicators of 37.4 mg / 100 g, and for anthocyanin content of 198 mg / 100 g. Gardeners appreciate it for its rather high yield, which, with a good level agricultural technology can reach 3.5-4 kg per bush.
3. "Cornish Victoria". The fruits have an unusual creamy yellow color, which immediately attracts the attention of others. But this is not the only variety with a similar berry color. In addition to it, there are, for example, "Apricot", "Golden Everest", "Golden Giant", "Honey", "Golden Queen" and others. What they all have in common is that the berries are sometimes saturated, but sometimes pale yellow, for which the species included in the group are often called "white raspberries". Like other varieties of the Cornish Victoria group, it contains little anthocyanins, but a lot of sugar, which is especially pleasing to lovers of very sweet berries.

4. "Cumberland". It is the most common black raspberry variety with a high yield - up to 4 kg / bush. Berries are sweet, round. But the popularity of this variety is also disputed by other fruitful and very sweet varieties of black raspberries: Bristol, Turn, Coal. Some of them are highly resistant to frost ("Coal", "Early Cumberland"), others - with special juiciness ("Bristol", "Luck"), others - with a unique taste originality ("Boysenberry").
5. "Strawberry-Raspberry". Some consider it a hybrid of raspberries and strawberries - club raspberries, because it reaches the size of a walnut and looks like both berries at the same time. However, this representation is not true. In fact, "Strawberry-Raspberry" is an East Asian variety of wild raspberry, presented on the market under the names "Tibetan", "Rose-leaved", "Dwarf", "Strawberry", "Chinese", etc. The species is gradually gaining popularity in our country as an ornamental hedge in gardens, because it has fluffy and prickly shoots, which in the middle latitudes do not rise above 1.5 meters. At the same time, large flowers on the bush get along well with already ripened huge fruits, which creates an additional decorative effect.

Raspberries should be grown taking into account varietal specifics. But in most cases, it can be planted both in spring (in the last decade of April) and in autumn (from late August to late September), which is preferable. Raspberry is propagated by root offspring by separate bushes or by a tape (trellis) method. Before this, the land should be well fertilized with peat compost or manure humus.

Raspberries like slightly acidic soil that can hold water well. Due to the occurrence of roots at a shallow depth, raspberries are sensitive to the drying of the earth. However, the plant also does not tolerate oversaturation of the soil with moisture, so you should take care of high-quality drainage.

Raspberry bushes need protection from the wind, which threatens to damage the shoots and interfere with pollinating insects. However, raspberries should not be hidden in a heavily shaded "corner" - without the sun and good lighting, fruiting is noticeably reduced, and the berries ripen sour.

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Raspberry - useful properties, composition and contraindications

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



B vitamins - description, benefits, effects on the body and best sources

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

Key words: B vitamins , vitamin B , benefits, harm, beneficial properties, contraindications, sources

What is the B group of vitamins?

To date, the vitamin B complex includes 12 interconnected water-soluble substances. Eight of these are considered essential vitamins and should be included in the diet:

- B1 (thiamine);

- B2 (riboflavin);
- B3 (niacin, also known as vitamin P or vitamin PP);
- B5 (pantothenic acid);
- B6 (pyridoxine or pyridoxamine);
- B7 (biotin, or vitamin H);
- B9 (folic acid, or vitamin M, vitamin B-c);
- B12 (cobalamin).

Vitamin -like substances

It is easy to see that in the group of vitamins B, the numbers of vitamins have gaps - namely, there are no vitamins B4, B8, B10 and B11. These substances exist, and they were once also considered B complex vitamins . Later it was found that these organic compounds are either produced by the body itself, or are not vital (it is these qualities that determine vitamins). Thus, they came to be called pseudovitamins , or vitamin -like substances. They are not included in the complex of vitamins of group B.

Choline (B4) is an essential component of nutrition for animals; a small amount of this substance is produced in the human body. It was first isolated in 1865 from bovine and porcine gallbladder and was named neurin. It helps produce and produce the neurotransmitter acetylcholine and also plays a role in fat metabolism. Choline is found in some foods - milk, eggs, liver, salmon and peanuts. In a healthy body, choline is produced on its own. Currently, scientists are considering the need to use choline as a supplement, as there is an opinion that there is not enough of its production in the body. In 1998, it was recognized as an essential substance.

Inositol (B8) is a substance important for cell signaling, the body's hormonal response, and nerve growth and function. Inositol is freely produced by the human body from glucose and is found in many body tissues. Despite this, it is also used in medicine to treat certain diseases. Inositol is widely used in industry.

Para - aminobenzoic acid (B10) is a widely distributed substance in nature, necessary for the growth of rats and poultry. It was first discovered as a remedy for depigmentation of the fur of laboratory mice. To date, it is believed that this compound is not a necessary factor for the human body.

Pteryl-hepta-glutamic acid (B11) is a substance that consists of several components and is considered one of the forms of folic acid. There is little information about this compound. It is believed that this is a growth factor for chicks ^[10, 21] .

Discovery history

Once upon a time, "vitamin B" was considered a single nutrient. Researchers later discovered that the extracts contained several vitamins, which were given distinctive numbers in the form of numbers. Missing numbers, such as B4 or B8, are either not vitamins (although they were considered as such when they were discovered), or are duplicates of other substances.

Vitamin B1 was discovered in the 1890s by the Dutch military doctor Christian Aikman , who was trying to find out what microorganism causes beriberi disease. Aikman observed that animals fed brown rice showed no signs of disease, while those fed rice without the husk. The reason for this was the presence in unpolished grains of a substance known today as thiamine.

Riboflavin, or vitamin B2, was the second vitamin complex discovered. It was found in milk as a yellow-green fluorescent pigment necessary for the growth of rats. In the early 1930s, this pigment was named riboflavin.

Niacin, or vitamin B3, was identified in 1915 when doctors concluded that its deficiency leads to pellagra disease. The Austro-American physician Joseph Goldberger learned while experimenting with inmates in a Mississippi prison that the missing factor was present in meat and milk, but not in corn. The chemical structure of niacin was discovered in 1937 by Conrad Arnold Elway.

Doctor R. Williams discovered **vitamin B5 (pantothenic acid)** in 1933 while studying the nutritional properties of yeast. Pantothenic acid is found in meat, vegetables, grains, eggs, and many other foods. Vitamin B5 is the precursor of coenzyme A, with its function in the metabolism of carbohydrates, proteins and lipids.

Vitamin B6 was discovered in 1934 by the Hungarian scientist Paul György, who was doing research on skin diseases in rats. By 1938, vitamin B6 had been isolated, and in 1939 it was given the name pyridoxine. Finally, in 1957, the required levels of vitamin B6 in the body were determined.

In 1901, scientists discovered that yeast required a specific growth factor they called "bios". Over the next 30 years, the bios turned out to be a mixture of essential factors, one of which is **biotin or vitamin B7**. Finally, in 1931, scientist Paul György isolated biotin in the liver and named it vitamin H - where H is short for "Haut und Haar", German words for "skin and hair". Biotin was isolated in 1935.

Despite the great progress that may have led to its discovery in the early 1930s, **vitamin B9** was only officially discovered in 1941 by Henry Mitchell. Also isolated in 1941. The name folic acid comes from "folium", which is the Latin word for leaves, because it was first isolated from spinach. It wasn't until the 1960s that scientists linked vitamin B9 deficiency to birth defects.

Vitamin B12 was discovered in 1926 by George Richard Minot and William Parry. Murphy, who found that eating large amounts of liver restored red blood cells in patients with pernicious anemia (the inability to produce enough red blood cells). In 1934, both scientists, as well as George Whipple, received the Nobel Prize for their work in the treatment of pernicious anemia. Vitamin B12 was officially isolated only in 1948^[2,8,9].

Products with the maximum content of B vitamins [3,4]:

Vitamin	Product	Content per 100 grams of product
B1 (Thiamin)	Lean pork	0.989 mg
	Peanut	0.64 mg
	Whole grain flour	0.502 mg
	Soya beans	0.435 mg
	Green pea	0.266 mg
	Tuna	0.251 mg
	Almond	0.205 mg
	Asparagus	0.141 mg
	Salmon	0.132 mg
	Sunflower seeds	0.106 mg
B2 (Riboflavin)	Beef liver (raw)	2.755 mg
	Almond	1.138 mg

	Egg	0.457 mg
	Mushrooms	0.402 mg
	Mutton	0.23 mg
	Spinach	0.189 mg
	Soya beans	0.175 mg
	Milk	0.169 mg
	Whole grain flour	0.165 mg
	natural yogurt	0.142 mg
B3 (Niacin)	Chicken breast	14.782 mg
	beef liver	13.175 mg
	Peanut	12.066 mg
	Tuna	8.654 mg
	Beef (stewed)	8.559 mg
	Turkey meat	8.1 mg
	Sunflower seeds	7.042 mg
	Mushrooms	3.607 mg
	Green pea	2.09 mg
	Avocado	1.738 mg
B5 (Pantothenic Acid)	Sunflower seeds	7.042 mg
	chicken liver	6.668mg
	Sun-dried tomatoes	2.087 mg
	Mushrooms	1.497 mg
	Avocado	1.389 mg
	Salmon	1.070 mg
	Corn	0.717 mg
	Cauliflower	0.667 mg
	Broccoli	0.573 mg
	natural yogurt	0.389 mg
B6 (Pyridoxine)	pistachios	1.700 mg
	Sunflower seeds	0.804 mg
	Sesame	0.790 mg
	Molasses	0.67 mg
	Turkey meat	0.652 mg
	Chicken breast	0.640 mg
	Beef (stewed)	0.604 mg
	Spotted beans (pinto)	0.474 mg
	Tuna	0.455 mg
	Avocado	0.257 mg
B7 (Biotin)	Beef liver, ready-made	40.5 mcg
	Egg (whole)	20 mcg
	Almond	4.4 mcg
	Yeast	2 mcg
	Hard Cheddar Cheese	1.42 mcg
	Avocado	0.97 mcg
	Broccoli	0.94 mcg
	Raspberry	0.17 mcg

	Cauliflower	0.15 mcg
	whole grain bread	0.06 mcg
B9 (Folic acid)	chickpeas	557 mcg
	Spotted beans (pinto)	525 mcg
	Lentils	479 mcg
	Leek	366 mcg
	beef liver	290 mcg
	Spinach	194 mcg
	Beet	109 mcg
	Avocado	81 mcg
	Broccoli	63 mcg
	Asparagus	52 mcg
B12 (cobalamin)	Beef liver, fried	83.13 mcg
	Beef liver, stewed	70.58 mcg
	Beef liver, raw	59.3 mcg
	Chicken liver, raw	16.58 mcg
	Mussels, raw	12 mcg
	shellfish	11.28 mcg
	Tuna, raw	9.43 mcg
	Sardines, canned in oil	8.94 mcg
	Atlantic mackerel, raw	8.71 mcg
	Rabbit	7.16 mcg

Daily requirement for B vitamins

Each component of the vitamin complex has a unique structure and performs certain functions in the human body. Vitamins B1, B2, B3 and biotin are involved in various aspects of energy production, vitamin B6 is essential for amino acid metabolism, and vitamin B12 and folic acid are involved in the preparation steps for cell division. Each of the vitamins also has many additional functions. In some body processes, several B vitamins are involved at the same time, such as vitamin B12 and folic acid. However, there is not a single process that would require all the B vitamins together. As a rule, B vitamins are fairly easy to obtain from ordinary foods. Only in some cases it is necessary to introduce synthetic supplements into food (for example, vitamin B12, found only in animal products, should be consumed by vegetarians and vegans from other synthetic sources) ^[1].

The daily allowance for each B vitamin varies from a few micrograms to several milligrams. On a day, the body should receive:

- **vitamin B1 (thiamine)** - 0.80 mg to 1.41 mg per day for adults, and 0.30 mg to 1.4 mg per day for children, depending on the level of daily activity - the more active the lifestyle, the more thiamine the body needs;
- **vitamin B2 (riboflavin)** - 1.3 mg per day for men over 14 years old, 1.1 mg per day for women over 14 years old (1.4 mg during pregnancy and 1.6 mg during lactation), 0.3 mg per day for newborns, 0.4 - 0.6 mg for children, 0.9 mg per day for adolescents from 9 to 13 years;
- **vitamin B3 (niacin)** - 5 mg per day for infants, 9 mg for children 1 to 3 years old, 11 mg for children 4-6 years old, 13 mg for children 7-10 years old, 14-15 mg for adolescents up to 14 years old, 14 mg for women over 15 years old, 18 mg for men over 15 years old;
- **vitamin B5 (pantothenic acid)** - on average, from 2 to 4 mg per day for children, 5 mg per day for adults, 7 mg during pregnancy and lactation;

- **vitamin B6 (pyridoxine)** - an average of 0.5 mg per day for children, 1 mg per day for adolescents 9-13 years old, for adults - 1.3 mg per day with an increase in dose to 2.0 mg during pregnancy and lactation;
- **vitamin B7 (biotin)** - 5 to 8 mcg per day for children under 4 years old, 12 mcg per day for children 9 to 13 years old, 20 mcg per day for adolescents 9 to 13 years old, 25 mcg per day for adolescents 14 to 18 years old, 30 micrograms for adults. With lactation, the norm increases to 35 mcg per day;
- **vitamin B9 (folic acid)** - 65-80 mcg per day for infants, 150 mcg for children 1 to 3 years old, 200 mcg per day for children 4 to 8 years old, 300 mcg per day for adolescents 9 to 13 years old, 400 mcg for adults and adolescents from 14 years old. During pregnancy, the norm rises to 600 mcg, during lactation - 500 mcg;
- **vitamin B12 (cobalamin)** - 0.5 - 0.7 mcg per day for children under 3 years old, 1 mcg per day for children under 10 years old, 1.3 mcg for children from 11 to 14 years old, 1.4 mcg for adolescents from 14 years of age and adults. Pregnant women are recommended to consume 1.6 micrograms of vitamin per day, lactating - 1.9 micrograms.

The need for B vitamins increases in the presence of the following factors:

- elderly age;
- strict vegan diet;
- frequent fasting diet;
- smoking, frequent alcohol consumption;
- surgical removal of sections of the digestive tract;
- taking certain drugs - corticosteroids, antidepressants, birth control and other medicines;
- pregnancy and lactation;
- increased physical activity;
- sickle cell anemia;
- chemotherapy ^[7].

Chemical and physical properties

Numerous components of the B-vitamin complex are not chemically or physiologically related to each other, but still have several common features:

1. 1 all of them, with the exception of lipoic acid, are water-soluble;
2. 2 most, if not all, are coenzymes and play a vital role in metabolism;
3. 3 most of them can be obtained from one source - liver or yeast;
4. 4 most of them can be synthesized by intestinal bacteria.

Thiamine is a white crystalline substance, easily soluble in water, slightly in ethyl alcohol, but insoluble in ether and chloroform. Its smell is reminiscent of yeast. Thiamine is destroyed at elevated temperatures if the pH is high. It can withstand short boils up to 100° C. Consequently, it is only partially lost during cooking or canning. Prolonged boiling or boiling in alkali destroys it. Stable in an acidic environment. Grinding wheat flour significantly reduces the thiamine content, sometimes even up to 80%. Therefore, in many cases, wheat flour is usually synthetically fortified with thiamine.

Riboflavin is a bright orange-yellow crystalline powder. It is soluble in water and ethanol, but insoluble in ether and chloroform. Resistant to heat and acids, but easily decomposed by alkalis and light. The aqueous solution has a yellow-green fluorescence. Withstands canning and cooking processes.

Pantothenic acid is a pale yellow viscous oil, soluble in water and ethyl acetate, but insoluble in chloroform. It is resistant to oxidizing and reducing agents, but is destroyed by heating in an acidic and alkaline environment.

Niacin is the simplest of all existing vitamins. It is a white crystalline substance, soluble in ethyl alcohol. Heat resistant. Nicotinamide, a derivative of niacin, occurs as white, needle-like crystals. It is soluble in water, resistant to heat and air. That is why cooking losses are usually minimal. Like thiamine, most of the vitamin B5 is lost during the grinding process.

The vitamin B6 group includes 3 compounds: pyridoxine, pyridoxal and pyridoxamine. All 3 forms of vitamin B6 are derivatives of pyridine, C_5H_5N and differ from each other in the nature of the substituent in the position of the 4th ring. All 3 forms are easily interchangeable biologically. Pyridoxine is a white crystalline substance and is soluble in water and alcohol, and slightly in fatty solvents. It is sensitive to light and ultraviolet radiation. Resistant to heat in both acidic and alkaline solutions, while pyridoxal and pyridoxamine are destroyed at high temperatures.

Biotin has an unusual molecular structure. Two forms of biotin can exist: allobiotin and epibiotin. Biotin and thiamine are the only sulfur-containing vitamins isolated to date. Vitamin B7 crystallizes in the form of long needles. Soluble in water and ethyl alcohol, but insoluble in chloroform and ether. It is heat resistant and resistant to acids and alkalis. Has a melting point of $230^{\circ}C$.

The **folic acid molecule** consists of 3 units, its molecular formula is $C_{19}H_{19}O_6N_7$. The various B9 vitamins differ from each other in the number of glutamic acid groups present. Folic acid is a yellow crystalline substance, slightly soluble in water and insoluble in fatty solvents. It is resistant to heat only in alkaline or neutral solutions. Loses activity under the influence of sunlight.

Vitamin B12 can only be found in animal products, animal tissues contain it in varying amounts. Under certain dietary conditions, vitamin B12 can be synthesized by intestinal microorganisms. Cyanocobalamin is unique in that it is synthesized only by microorganisms, especially anaerobic ones. The structure of vitamin B12 is one of the most complex. It is a deep red crystalline substance. Let's dissolve in water, alcohol and acetone, but not in chloroform. B12 is resistant to heat in neutral solutions, but is destroyed by heat in acidic or alkaline solutions. ^[10].

Useful properties of B vitamins

There are many opinions about the benefits of various B vitamins. Thiamine is supposed to help maintain the condition of people with Alzheimer's disease, a disease that is also associated with low levels of pyridoxine and cobalamin. High doses of niacin prescribed by a physician lower cholesterol levels and balance lipoproteins. Some evidence suggests that niacin may prevent juvenile diabetes (type 1, insulin dependent) in children at risk by maintaining pancreatic insulin excretion for longer than usual. Niacin is also used to relieve intermittent claudication and osteoarthritis, although using high doses for the latter can lead to liver problems. Migraine frequency can be significantly reduced and severity reduced by the use of supplemental riboflavin. Pyridoxine is used therapeutically to reduce the risk of heart disease, to relieve nausea during pregnancy, and to relieve symptoms of premenstrual syndrome. When combined with magnesium, pyridoxine may have some beneficial effects on the behavior of children with autism. Cobalamin supplementation has been shown to improve male fertility. Depression, dementia, and mental impairment are often associated with both cobalamin and folic acid deficiencies. Folic acid may reduce the chance of cervical or colon cancer in certain risk groups ^[7].

vitamins play a key role in the processes of DNA formation, being responsible for the speed of some processes. Severe deficiency of B vitamins can lead to failures in the formation of new cells and their uncontrolled growth, which, in turn, can cause cancers.

B vitamins, among other substances (such as vitamins C, D, E, omega-3s, fats, coenzyme Q10, lipoic acid), are very important for heart health. Particularly noteworthy is the role played by folic acid, B6 and B12 in lowering homocysteine levels. Although it has not been officially confirmed by medicine, many studies have observed high levels of homocysteine in fat deposits on the endothelium (the thin layer of cells that line the inside of blood vessels), as well as in blood clots and in heart disease.

Psychiatrists are also increasingly turning to B vitamins as a treatment. Together with vitamin C, they help support an efficient adrenal response to stress. Many studies show that up to 30 percent of patients hospitalized with depression are deficient in B12. Several epidemiological studies have reported an association between low blood levels of folate, vitamins B6 and B12, and a higher prevalence of depressive symptoms. B-vitamin deficiency is also associated with anxiety disorder and, especially, obsessive-compulsive disorder. Many physicians begin to treat OCD with therapeutic doses of the vitamin inositol.

Finally, it is impossible not to note the influence of the level of B vitamins on the amount of energy and vitality. Deficiency often leads to chronic fatigue, fatigue and drowsiness ^[11].

Each B vitamin is either a cofactor (usually a coenzyme) for key metabolic processes or a precursor needed to carry them out. These vitamins are water-soluble, meaning they are not stored in the fatty tissues of the body, but are excreted in the urine. The absorption of B vitamins occurs in the digestive tract and usually requires certain substances (proteins) in the body to allow the vitamins to be absorbed.

Interaction with other elements

All processes in the body are interconnected, so some substances can increase the effectiveness of B vitamins, and some can reduce it.

Fats and proteins reduce the body's need for vitamin B1, while carbohydrates, on the contrary, increase it. Raw seafood (fish and shellfish) contains an enzyme (thiaminase) that breaks down thiamine in the body. Therefore, people who eat large amounts of these foods may experience symptoms of vitamin B1 deficiency. In addition, thiamine interacts with magnesium; without it, B1 cannot turn into its biologically active form. Riboflavin should not be taken with calcium, which reduces its absorption. Niacin works in tandem with zinc to provide higher levels of antioxidants and zinc in the liver. Copper increases the body's need for vitamin B5. Vitamin B6 (pyridoxine) is advised to be used with magnesium, among the positive effects of this combination is the relief of symptoms of premenstrual syndrome. Undesirable is the combination of pyridoxine and thiamine, as well as pyridoxine and vitamin B9. Folic acid is undesirable to use with zinc, as well as vitamin B12, as they mutually increase the body's need for each other. Cobalamin (B12) should not be taken with vitamin C, especially when taking thiamine and copper at the same time ^[12].

The best food combinations for the absorption of B vitamins:

1. **Pumpkin pudding with chia seeds**. Ingredients: milk, pumpkin puree, chia seeds, maple syrup, sunflower seeds, almonds, fresh blueberries. Contains thiamine, biotin, proteins, fiber and many other beneficial substances.

2. **Salad with quinoa and kale.** Ingredients: quinoa, fresh kale, red cabbage, carrots, dill, boiled eggs, rice vinegar, extra virgin olive oil, ground black pepper. Contains riboflavin, biotin, folic acid and cobalamin.
3. **Gluten free salad with quinoa and broccoli.** Ingredients: Fresh Broccoli, Quinoa, Cucumber, Cherry Tomatoes, Pumpkin Seeds, Sea Salt, Ground Black Pepper, Dijon Mustard, Vinegar, Extra Virgin Olive Oil, Maple Syrup. Contains thiamine and riboflavin.
4. **Gluten-free stuffed peppers with quinoa.** Ingredients: quinoa, green bell peppers, canned lentils, fresh spinach, feta cheese , frozen corn kernels, salt, black pepper. Contains thiamine, riboflavin, pyridoxine, folic acid, pantothenic acid and cobalamin.

In the absence of medical contraindications, diseases, and ethical preferences, B vitamins are best obtained from food. These vitamins are widely distributed in many foods and it is easy to find a diet that would replenish the supply of vitamins and appeal to anyone. The exception is vitamin B12, which can only be obtained from animal products and is therefore difficult to obtain in its natural form for vegans . In this case, under the supervision of a doctor, synthetic vitamins are prescribed. In spite of everything, the uncontrolled intake of synthetic vitamins can not only not bring benefits, but also harm. Therefore, it is recommended to consult a doctor before taking any vitamins.

Application in official medicine

Due to the fact that each vitamin of group B has its own functions, one or another vitamin is prescribed by a doctor, depending on the immediate indications.

Vitamin B complex is prescribed , first of all, with a clear deficiency, insufficient absorption or with a limited diet. I also often advise taking these vitamins in old age, as well as for people who drink alcohol or smoke. Folic acid is often prescribed during preparation or during pregnancy, as it contributes to the proper development of the fetus. In addition, a complex of B vitamins in the form of medicines is advised to be taken in such cases:

- to accelerate wound healing;
- with stomatitis;
- to improve the physical form of athletes;
- with stress;
- in anxiety states;
- as part of complex therapy for vitiligo;
- to relieve symptoms of premenstrual syndrome;
- hyperactivity and attention deficit syndrome ^[1];
- for the relief of acute pain ^[13] .

Currently, in pharmacies you can buy B vitamins both individually and in the form of a complex. Most often, multivitamins come in the form of tablets. As a rule, such vitamins are taken in courses, on average within one month. Separately, B vitamins can be found in the form of injections (intravenous and intramuscular) - they are prescribed to improve and accelerate the absorption of substances - and capsules.

B vitamins in traditional medicine

Traditional physicians, as in traditional medicine, recognize the importance of the B complex vitamins in energy production processes, overall body health, and skin, hair, and nail health. Ointments containing B vitamins (especially B6) are recommended for eczema. Rubbing with vitamins B1, B2 and B6 is used for arthritis. There are also folk recipes for treating anemia with foods containing high

amounts of vitamin B12. An extract from the liver of a calf is considered especially useful, in which there are many vitamins, and the amount of fat and cholesterol is minimal ^[14].

Latest scientific research on B vitamins

- Scientists at the University of Adelaide, Australia, have found that taking vitamin B6 can help people remember their dreams. The study, published online, included 100 Australian participants who took high-vitamin B supplements before bed for five consecutive days. Vitamin B6 did not affect the brightness, quirkiness or color of dreams, and other aspects. Some participants took a placebo drug, while the rest received 240 mg of vitamin B6 immediately before bedtime. Many subjects, who rarely remembered their dreams before, admitted that after taking the vitamin it was easier for them to remember what they dreamed about. However, study leaders warn that long-term use of such doses of pyridoxine should be carried out under the supervision of the attending physician ^[15].
- A recent report published in the Journal of the Endocrine Society examines a case of misdiagnosis due to biotin supplementation. supplement known as vitamin B7. The patient was taking 5,000 micrograms of biotin daily, which resulted in erroneous clinical trials, unnecessary radiography, tests, and almost entailed a complex invasive procedure that is prescribed for hypercoagulability. This is because the doctors suspected that the patient had hypercortisolemia or a testosterone-producing tumor. It turned out that the primary symptoms were caused by excessive consumption of biotin, which is traditionally considered a vitamin that improves the condition of the skin, hair and nails ^[16].
- A review article published in the Journal of the American Institute of Cardiology hypothesizes that vitamin supplementation has no benefit in preventing or treating heart disease. The researchers found that data on the four most commonly used supplements—multivitamins, vitamin D, calcium, and vitamin C—did not show positive results for the prevention of cardiovascular disease, myocardial infarction, or stroke, and there was no change in death rates from all of the above causes. The only exception was folic acid and group B multivitamins, in which folic acid was a component. Vitamin B9 has been shown to reduce the risk of stroke. At the same time, niacin (vitamin B3) and antioxidants have been associated with an increased risk of death from heart disease ^[17].

B vitamins in cosmetology

It can be said without a doubt that B vitamins are vital for the beauty and health of hair, skin and nails. That is why there are many recipes for masks, decoctions, lotions - both with natural ingredients and with the addition of pharmaceutical vitamins.

Hair masks, which include B vitamins, are most often positioned as strengthening, restoring and improving pigmentation. The most useful and commonly used natural products containing vitamins are raw egg and aloe vera juice. Various oils, honey and herbal decoctions are added to them. Thus, a mixture of substances necessary for hair (vitamins B, A and E) is obtained, which has antiseptic, antioxidant and conditioning properties. Such compositions, for example, are a mixture of egg yolk, burdock oil, honey and aloe juice. In addition, you can safely use pharmacy B vitamins in ampoules, adding them to vegetable oil and mixing with decoctions, for example, chamomile or nettle. The most effective pharmaceutical vitamins for hair are vitamins B1, B3, B6 and B12.

vitamins are indispensable for the beauty and health of the skin. They have healing and antioxidant properties. In addition, in combination with other components, they bring additional benefits as a rejuvenating, protective, moisturizing and antibacterial agent. The products used in face masks are egg, banana, spinach, almonds, oatmeal, avocado.

- An effective recipe for acne is considered a mask, which includes a pinch of sea salt, a pinch of turmeric, a teaspoon of honey, natural yogurt and half a mashed banana.
- For oily skin, a mask with 1 teaspoon of aloe vera juice, 1 teaspoon of chamomile decoction, half a teaspoon of lemon or apple cider vinegar, half a mashed banana and 1 teaspoon of starch is recommended.
- A homemade scrub can be made with 1 teaspoon honey, 1 teaspoon oatmeal, a pinch of salt, a pinch of brown sugar, 1 teaspoon of avocado or almond oil, and 1 teaspoon of mashed kiwi, pineapple, or papaya.
- For aging skin, an antioxidant mask with 1 teaspoon of argan oil, 1 teaspoon of honey, pureed guava, 1 teaspoon of sunflower oil, and 1 teaspoon of ground almonds may be suitable.

Biotin, vitamins B6 and B12 are very important for nail health. It is advised to use almond oil, avocado to strengthen the nail plate.

Do not forget that beauty comes primarily from within, and the most important thing is to ensure the access of all vitamins and minerals from food. A healthy body, in which there are enough necessary substances, looks beautiful and well-groomed.

B vitamins in animal husbandry

Just like for human health, B vitamins are vital for animals. They ensure the normal functioning of the nervous and immune systems, growth and development, energy production, metabolism in cells and organs, as well as a healthy appetite and digestion of the animal. All vitamins of the group are irreplaceably important, so it is necessary to provide access to the entire complex in the body. As a rule, industrial animal feeds are artificially enriched with vitamins and minerals. Particular attention should be paid to the presence of thiamine in the feed, as it is more susceptible to destruction ^[18].

B vitamins in crop production

There are several vitamins that act as plant biostimulants, but the most popular are B1, B2, B3 and B6 due to their positive effect on the plant's metabolism. Many microorganisms produce B-vitamins as natural by-products, but yeast extracts contain the highest concentrations. B-Vitamins work at the cellular level and are commonly found as supplements in cloning gels and cloning solutions, mineral bed preparation solution, and most commercial plant biostimulants.

One of the best uses for B vitamins is to help plants recover from transplanting. When a plant is transplanted, the microscopic root hairs are often damaged, making it difficult to get enough water and minerals. Adding B-vitamins to irrigation water gives plants the boost they need. B vitamins are also useful when transplanting from soil to hydroponics. To do this, before transplanting, the plant is immersed in water enriched with B vitamins ^[19].

Interesting facts about B vitamins

- Royal jelly contains a fairly complete vitamin B complex to the extent that it can be taken in the same way as dietary supplements.
- Thiamine deficiency is commonly found in countries where white rice is the staple food. In Western countries, it is most often caused by excessive drinking or a very unbalanced diet.
- Excessive consumption of raw egg whites, such as by bodybuilders, can interfere with the absorption of biotin and cause a deficiency.
- Studies show that people with low folic acid levels are more likely to experience hearing loss after age 50.

Dangerous properties of B vitamins, their contraindications and warnings

Deficiency of each of the vitamins of the complex manifests itself in the form of certain symptoms, in each case they may differ. And only a doctor, after conducting special studies, will be able to say whether you have a deficiency of a particular vitamin. However, there are the most common symptoms of a B vitamin deficiency, including:

- nervous disorders;
- visual disturbances, conjunctivitis;
- inflammation of the tongue, skin, lips;
- dermatitis;
- anemia;
- depression, anxiety, fatigue;
- confusion of consciousness;
- hair loss;
- sleep disturbance;
- slow wound healing ^[20] .

In many cases, large doses of water-soluble vitamins can be taken without side effects because excess amounts are easily excreted from the body. However, when taking more than 500 mg of niacin daily, inflammation of the liver can develop. Niacin can also cause problems with blood sugar control in diabetics, as well as increase uric acid levels, which can aggravate gout. In addition, excess niacin increases the secretion of gastric juice and lowers blood pressure. However, the form of niacin known as inositol hexaniacinate does not generally cause these effects.

High doses of pyridoxine can cause liver inflammation or permanent nerve damage.

High doses of vitamin B2 can lead to discoloration of urine, this is a normal side effect and does not pose a danger to the body.

In general, B vitamins are not toxic, and no severe side effects have been noted when exceeding the daily allowance. However, any vitamin preparations should be taken with caution and consult with your doctor about contraindications and interactions with other drugs ^[7] .

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Vitamin B - useful properties, composition and contraindications

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