



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 $\frac{1}{4}$ 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 $\frac{2}{3}$ 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 80-85C).

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- vitaminy 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.

Literature

1. US National nutrient database , [source](#)
2. US National nutrient database , [source](#)
3. US National nutrient database , [source](#)
4. Kähkönen M, Kylli P, Ollilainen V, Salminen JP, Heinonen M J. Agric Food Chem. Antioxidant activity of isolated ellagitannins from red raspberries and cloudberries. Feb 8, 2012
5. Figueira ME, Câmara MB, Direito R, Rocha J, Serra AT, Duarte CM, Fernandes A, Freitas M, Fernandes E, Marques MC, Bronze MR, Sepodes B. Chemical characterization of a red raspberry fruit extract and evaluation of its pharmacological effects in experimental models of acute inflammation and collagen-induced arthritis. food Funct . 2014 Dec .
6. Sangiovanni E, Vrhovsek U, Rossoni G, Colombo E, Brunelli C, Brembati L, Trivulzio S, Gasperotti M, Mattivi F, Bosisio E, Dell'Agli M. Ellagitannins from Rubus berries for the control of gastric inflammation: in vitro and in vivo studies. PLOS one . 2013.
7. Yu YM, Wang ZH, Liu CH, Chen CS. Ellagic acid inhibits IL-1beta-induced cell adhesion molecule expression in human umbilical vein endothelial cells. Br J Nutr . 2007 Apr .
8. Jia H, Liu JW, Ufur H, He GS, Liqian H, Chen P. The antihypertensive effect of ethyl acetate extract from red raspberry fruit in hypertensive rats. Pharmacogn Mag 2011.
9. Suh JH, Romain C, Gonzalez-Barrio R, Cristol JP, Teissedre PL, Crozier A, Rouanet JM. Raspberry juice consumption, oxidative stress and reduction of atherosclerosis risk factors in hypercholesterolemic golden Syrian hamsters. food Funct 2011.
10. Yu YM, Chang WC, Wu CH, Chiang SY. Reduction of oxidative stress and apoptosis in hyperlipidemic rabbits by ellagic acid. J Nutr Biochem 2005.

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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.