

# *Journal of Healthy Nutrition and Dietetics*

## In issue:



Burdock



Coltsfoot



Cucumber



Banana



Viburnum

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



Vitamin D

Top 12 foods rich in vitamin D, why the body needs it, daily requirement, signs of deficiency and excess.



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## Burdock (lat. *Arctium*)

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

**Keywords:** burdock, beneficial properties, potentially dangerous effects, side effects, contraindications, diets

## Beneficial features

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

| Main substances (g / 100 g): | raw root | Boiled root <sup>[5]</sup> |
|------------------------------|----------|----------------------------|
| Water                        | 80.09    | 75.64                      |
| Carbohydrates                | 17.34    | 21.15                      |
| Alimentary fiber             | 3.3      | 1.8                        |
| Squirrels                    | 1.53     | 2.09                       |
| Fats                         | 0.15     | 0.14                       |
| Calories ( kcal )            | 72       | 88                         |
| Minerals (mg/100 g):         |          |                            |
| Potassium                    | 308      | 360                        |
| Calcium                      | 41       | 49                         |
| Phosphorus                   | 51       | 93                         |
| Magnesium                    | 38       | 39                         |
| Sodium                       | 5        | four                       |
| Iron                         | 0.8      | 0.77                       |
| Zinc                         | 0.33     | 0.38                       |

| <b>Vitamins (mg/100 g):</b> |      |       |
|-----------------------------|------|-------|
| Vitamin C                   | 3    | 2.6   |
| Niacin                      | 0.3  | 0.32  |
| Vitamin E                   | 0.38 | 0.46  |
| Vitamin B6                  | 0.24 | 0.279 |
| Riboflavin                  | 0.03 | 0.058 |
| Vitamin K                   | 1.6  | 2     |

### **What exactly is used and in what form**

For medicinal purposes, the roots, leaves and seeds of burdock are used. On the basis of the roots, decoctions and infusions are prepared. The root is used fresh and in the form of a liquid extract. In medicinal recipes, burdock root powder is used. Infused with olive or almond oil, the root of the plant is used as the famous "burdock oil". The root is a part of ointments and tinctures, medicinal tea. Burdock leaves are used in compresses, lotions, to prepare a decoction. Fresh burdock juice is used for various skin diseases. Fresh burdock root is used in homeopathy. <sup>[2]</sup>

### **Medicinal properties**

Burdock root contains 0.17% bardan oil, 45% inulin, 12.5% proteins, antibacterial substances (polyacetylene components), potassium nitrate, sterols (sitosterol, stigmasterol), acids (palmitic and stearic), tannins. Burdock seeds contain arctin glycoside, leaves contain tannins, mucus and essential oils.

In herbal formulations, burdock is prescribed for chronic rheumatism, skin diseases (eczema, itching, hair loss as a result of seborrhea). <sup>[6]</sup>

Burdock root preparations have diuretic, choleric, diaphoretic and disinfectant properties; stimulate the formation of proteolytic enzymes and accelerate the insulin-forming function of the pancreas; promote the growth of glycogen in the liver, have a beneficial effect on metabolism. A decoction of burdock root is prescribed internally for metabolic diseases (gout, articular rheumatism, kidney and gallstones, diabetes mellitus); with skin diseases (rashes on the skin and suppuration against the background of scrofula, boils, acne); with gastritis and gastric ulcer, with chronic constipation, hemorrhoids, edema, rickets and delayed menstruation. Burdock root powder is taken orally for gout. Burdock is part of the diaphoretic tea. An infusion of burdock leaves is drunk in violation of the functional activity of the stomach and fever, and an infusion of burdock fruit - with constipation. Young leaves have antibacterial properties. Juice from leaves and flowers, as well as an aqueous infusion of flowers, are used in folk medicine to treat wounds and skin cancer. <sup>[7]</sup>

### **In official medicine**

Among the pharmaceutical preparations created on the basis of the plant: burdock oil, dried burdock root for the preparation of medicinal preparations, burdock root extract.

### **In folk medicine**

- As a diuretic, diaphoretic, choleric agent and to enhance metabolism and remove toxins from the body, a decoction is useful: pour half a tablespoon of crushed burdock root into 200 ml of water. Boil over low heat for 10 minutes, let it brew for two hours. Take 100 ml in small sips 2-3 times a day. <sup>[6]</sup>

- In diabetes mellitus, a tablespoon of a mixture of crushed burdock roots, bean husks, blueberry leaves and walnuts (in equal parts) is infused in 250 ml of water, boiled for 5 minutes, and taken after meals during the day, drinking from 5 to 6 glasses per day.
- For gout, gastric ulcer, metabolic disorders, itching of the body, a tablespoon of a mixture of burdock root, wheatgrass rhizomes, string grass, Veronica grass and tricolor violet, pour a glass of water, simmer for a quarter of an hour, take up to 3 glasses a day (first fasting intake).
- For eczema, rheumatism, a decoction is taken orally, which is prepared from a mixture of burdock root and high elecampane (in equal proportions), while using ointment, therapeutic baths and warming compresses on the affected areas of the body. <sup>[eight]</sup>
- For chronic constipation, an infusion of burdock seeds is used: pour 20 g of seeds into 200 ml of boiling water, let it brew for 60 minutes, take 1-2 tablespoons up to 4 times a day.
- For dermatosis, psoriasis, neurodermatitis, urticaria, seborrhea, acne vulgaris, a decoction is recommended: 2 tablespoons of crushed root per 500 ml of water. Take half a glass four times a day, before meals.
- In folk medicine, a decoction of burdock leaves is drunk as tea for malignant tumors, liver diseases, abscesses, wounds, warts.
- For allergies, mix a tablespoon of rose hips, crushed dandelion roots and burdock roots. Pour a tablespoon of this collection with a glass of boiling water and heat in a water bath for a quarter of an hour. Let the broth cool and strain. Drink 0.3 cup three times a day.
- For asthma, prepare a mixture of 4 tablespoons of burdock leaves, 4 tablespoons of aspen leaves and a teaspoon of fir needles. Collection pour 200 ml of cooled boiling water, pour half a teaspoon of soda and soak the infusion for 6 days in a dark, cool place. After that, strain the infusion and drink a tablespoon once a day.
- For rheumatism, a recipe is recommended: mix half a glass of burdock juice and linden honey. Infuse for a week in a cool dark place. Drink a teaspoon three times a day before meals. <sup>[9]</sup>

#### Externally:

- With sciatica, put 6-9 fresh burdock leaves on a clean cloth, press on top with a bowl of very hot water. Soak the leaves under a hot press for about 5 minutes. When brown juice begins to stand out from the burdock, the leaves should be applied to the affected area of the body. Cover the compress tightly with paper and woolen cloth, and leave for 2-3 hours.
- For hair loss, the following procedure is useful: pour 2 tablespoons of burdock roots into 200 ml of boiling water and heat in a water bath for about 10 minutes. Then cool the broth and strain. Add 100 ml of onion juice and 3 tablespoons of vodka. Rub this mixture into the hair roots several times a week for an hour or two before shampooing.
- For rheumatism, arthritis, ulcers, lichen, eczema, a decoction of a mixture of burdock roots, heather herb, nettle roots, marsh wild rosemary herb, tartar herb and lingonberry leaves is added to the bathroom.
- For hair loss and dandruff, wash your hair twice a week with a decoction of burdock root and calendula flowers in a ratio of 2: 1 (a handful of collection per liter of water). Or use a decoction: per liter of water, a mixture of burdock roots, heather herb and nettle (2 tablespoons each) and one tablespoon of hop cones.
- Burdock ointment for the treatment of skin diseases, seborrhea: a collection of fresh burdock root, oak bark, walnut leaves and calendula flowers (2: 1: 1: 1) is combined with a glass of sunflower, almond or olive oil, boiled for a quarter of an hour over low heat, cover with a lid and leave in a warm place overnight. In the morning, strain the oil decoction. The resulting ointment lubricates the affected areas. Burns, chronic rheumatism are treated with this ointment.
- With erysipelas, young leaves of burdock are smeared with sour cream and applied to the affected areas.

- For dandruff, place burdock roots in a saucepan, cover with water and simmer over low heat. Cook until the roots are very soft. Then strain and cool the broth. Lubricate the hair roots with this decoction every day.
- Burdock root tincture is prepared on strong vodka (in proportions 1:10). Root tincture on vodka lubricates areas of the body affected by circular or nested baldness, red acne (inflammation of the sebaceous glands).
- Crushed (pounded) fresh burdock leaves are applied to wounds, hard tumors, gouty nodes.

**Burdock ointment (based on roots)** : 40 g of fresh crushed roots insist for a day in half a glass of vegetable oil, then boil for a quarter of an hour. The ointment heals burns, ulcers, wounds well.

**Recipe for burdock oil: Rinse** 75 g of fresh burdock leaves, chop and pour a glass of vegetable oil, let it brew for a day, then boil for a quarter of an hour and strain. Rub into the scalp 60 minutes before washing. This procedure helps to strengthen the hair. <sup>[2,7,9]</sup>

### in oriental medicine

Ancient Chinese medicine used burdock seeds (" *niupangji* ") in the treatment of fever, colds and coughs, arthritis, anorexia, and various gastrointestinal disorders. In China, burdock seeds and all fresh parts of the plant were also taken internally as a diuretic when fluid accumulated in the tissues.

### In scientific research

The herbalist (1653) of the British N. Culpeper says about burdock: "The leaves of burdock treat ulcers and inflammations on the skin. The composition of a small amount of burdock root and seeds (nuts) of pine helps with hemoptysis and purulent process in the bronchi and lungs. Pain in injured tendons can be relieved by applying burdock leaves. Burdock leaf juice mixed with wine is used for snake bites. Burdock root, crushed and mixed with a small amount of salt, is used externally for the bites of rabid dogs. Burdock juice combined with honey acts as a diuretic and relieves pain in the bladder. An infusion of burdock seed wine is useful for sciatica. Burns are treated with lotions of crushed burdock leaves and egg white. <sup>[ten]</sup>

Numerous recipes based on burdock were collected and actively used by the famous Soviet herbalist from Irkutsk Elena Vasilievna Lohe , who made a huge contribution to the system of research on the medicinal properties of the plant.

- The pharmacological properties of burdock were investigated by J.S. Chan , L.N. Cheng , J.H. Wu et al. <sup>[11]</sup>
- of Karomatov I.J. , Nurmukhamedova R.A., Badriddinova M.N. is devoted to the prospects of phytopreparations based on burdock . <sup>[12]</sup>
- The purpose of scientific research Fedoseyeva L.M., Knaub N.N. and Seligeeva T.G. is a histochemical analysis of the leaves and roots of burdock . <sup>[13]</sup>
- therapeutic effect of the oil extract from the burdock root is analyzed in the work of Bekkuzhin A. G. and Berdgaleeva A. K. <sup>[14]</sup>
- An important role for burdock preparations is predicted by scientists in the future in the treatment of oncological diseases . For example, the antitumor effect of biologically active substances contained in burdock roots is described in the dissertation of Boev R. S. <sup>[15]</sup>

### In cooking

Salads from young leaves of burdock are part of the therapeutic and prophylactic diet. Young burdock root baked or fried is used as a substitute for potatoes. The dried root, cut into small pieces and roasted

in the oven, is also an excellent coffee surrogate. From the roots of burdock, a thick, jelly-like jam is brewed, of a beautiful yellow-green hue.

- Salad with burdock leaves

Dip young burdock leaves in boiling water for 1-2 minutes, then dry on a towel or napkin, finely chop, add chopped green onions, salt, grated horseradish and season with cream. For 150 g of burdock leaves, take 50 g of green onions, 30 g of horseradish, 20 g of cream and salt to taste. <sup>[7]</sup>

- Burdock soup

Ingredients: 100 g of burdock root, a quarter of an onion, 2 slices of bacon, a bunch of fresh parsley, two tablespoons of vegetable oil, 0.5 liters of water, 1 bouillon cube, salt, pepper to taste.

Wash and clean the burdock roots, cut into strips and soak in water. Finely chop the onion, chop the bacon, chop the parsley. Heat the oil in a frying pan, fry the bacon and onion, add the chopped burdock root, simmer everything over low heat. Pour in water, throw in the bouillon cube, cook the soup until the burdock root softens. Salt, pepper. Serve with chopped herbs.

- Sandwiches with burdock

To prepare a snack, you will need: 2 leaves of burdock, a tablespoon of low-fat cottage cheese, carrots, onions, 5 dandelion flower buds, 2 tablespoons of kefir, a little grated cheese.

Rinse young burdock leaves, cut into neat, even squares or triangles. Prepare the filling: mix cottage cheese with chopped raw carrots, onions, add grated cheese, kefir, mix.

Put the sandwich mass on the leaves of burdock, decorate with a dandelion flower.

- Burdock and dandelion beer

The original recipe for the drink, which has become traditional and popular, was invented in Britain back in the Middle Ages.

To make such a beer ( Dandelion and Burdock beer ) you will need: 150 g of burdock root, 50 g of dandelion roots, 0.5 kg of sugar, 2 tablespoons of molasses, juice of one lemon, brewer's yeast (one bag), 4.5 liters of water. Rinse and peel the burdock and dandelion roots, cut them into thin slices and boil in half the water required for the recipe for 30 minutes. Remove from heat, add remaining water (cold), sugar, molasses and lemon juice, and stir until sugar is completely dissolved. Strain into a fermentation bowl, cover with a lid. When the liquid has cooled to room temperature, add brewer's yeast and stand for a week. Then pour into a special bottle and stand for another week. After that, the drink is ready. Store herbal beer in the refrigerator. <sup>[17]</sup>

- Burdock Root Chips

To prepare these chips you will need: a few large burdock roots, olive oil, sea salt. Wash the roots, peel and cut into thin strips. Drizzle the roots with a little olive oil, salt to taste. Preheat the oven to 220 0. Put the strips on a roasting pan lined with baking paper. Bake the chips for about 10 minutes until light brown, then flip and bake the other side of the strips. Salt if necessary.

- Carrot cookies with honey infused with burdock root

For the dough you will need: a cup of wheat flour, a teaspoon of baking powder, a quarter teaspoon of salt, 100 g butter, one egg yolk, half a cup of honey infused with burdock root,  $\frac{3}{4}$  cup of grated carrots (take two medium root vegetables), half a cup of oatmeal, half a cup of light raisins,  $\frac{3}{4}$  cups of shelled walnuts.

- For cream: 120 g cream cheese, 100 g butter, 1.5 cups powdered sugar.

To prepare honey infused with burdock root: a tablespoon of dried burdock root, ground into powder, 160 g of honey. Prepare honey in advance by mixing it with burdock root powder. Let honey brew for 5-10 days. Keep honey in a warm and not darkened place, stirring occasionally.

For the dough, sift flour, mix with baking powder, salt. Beat the butter, gradually adding the egg yolk, prepared honey and grated carrots. Combine flour with butter -egg mixture, oatmeal, nuts and raisins. Preheat the oven to 180 °C and with a spoon put the dough in portions on a roasting pan covered with baking paper, forming flat round gingerbread cookies. Bake the cookies for 15 minutes until golden brown, checking for doneness. When cookies are completely cool, decorate with cream (beat cream cheese, butter and powdered sugar, adding a drop of vanilla extract). Leave the cookies in the refrigerator for a while to set the cream. <sup>[16]</sup>

### **In cosmetology**

- Burdock for hair

To strengthen the hair roots, a decoction is used: 2 tablespoons of burdock roots are poured into 200 ml of boiling water, then heated in a water bath for about a quarter of an hour. Strain the cooled broth and rub it into the scalp and hair roots after washing with shampoo.

Hair rinse with burdock: a mixture of calamus rhizomes, burdock roots, medicinal marigold flowers and common hop cones (each herb in a tablespoon) pour a liter of boiling water. Warm in a water bath for a quarter of an hour. Let the broth brew and cool. Strain and rinse hair after washing.

The following recipe is also useful for hair: mix a tablespoon of burdock roots, large plantain leaves, mint herb, St. John's wort and stinging nettle. Take 3 tablespoons of this collection, pour a liter of hot water, heat in a water bath for a quarter of an hour. Cool the broth, strain and use as a hair rinse.

The use of such a decoction strengthens and makes hair healthier: mix the crushed burdock roots and calamus rhizomes in equal parts. 6 tablespoons of this collection is poured with a liter of water and boiled for a quarter of an hour. Then insist in a warm place. Rub the decoction into the scalp up to 3 times a week.

Firming burdock hair mask: mix one part cognac, 4 parts strained onion juice and 6 parts decoction of burdock roots. Rub the whole mass thoroughly. Rub into the scalp, then wrap with a towel to warm. Wash off the mask after 2 hours.

- Burdock for skin

For oily skin, an infusion of a tablespoon of freshly chopped burdock roots and 200 ml of boiling water is recommended. Leave the infusion for half an hour, then strain. Soak a clean cloth or gauze in the infusion and apply to cleansed face for 10 minutes.

A decoction helps with acne: prepare a mixture of burdock roots and St. John's wort herb ( a tablespoon). Collection pour 200 ml of boiling water and heat in a water bath for a quarter of an hour. Cool the broth, strain, and wipe the skin affected by acne with it. <sup>[9]</sup>

- **Other uses**

Burdock burdock is used to get rid of mice. They are scattered near supposed mouse holes. Burdock clings to the skin of a rodent, causes itching, irritation and dares from the habitat.

Burdock oil has found application in industry: in soap making, in the manufacture of drying oil and wrapping paper, in the operation of gyroscopic instruments.

In the fight against pests of agricultural crops (caterpillars of cabbage whites, scoops, moths), an infusion is used: pour half a bucket of chopped burdock leaves to the top with water. Infuse for at least 3 days. Then strain and spray garden and garden crops.

For skin diseases in pets and cattle, a decoction (one part of burdock roots per 10 parts of water) is used to wash animals. <sup>[3]</sup>

### **Dangerous properties of burdock and contraindications**

Some individuals may experience an allergic reaction due to individual intolerance to burdock preparations. Plant treatment of pregnant and lactating mothers is possible only with the permission and under the strict supervision of the attending physician. <sup>[3,9]</sup>

### **Botanical description**

Burdock is a biennial plant that belongs to the Asteraceae (Asteraceae) family.

### **origin of name**

The popular names of burdock are *burdock*, *burdock (burdock)*, *grandfather*, *dog lover* , *zaderka* . The Latin name of the genus - *Arctium* - goes back to borrowing from the Greek language and is translated as " bear ".

### **Kinds**

Modern botany has identified 19 species of burdock, of which the most common are:

1. **Large burdock** - the habitat is very extensive, including Europe, Asia, the African continent, the Far East, India. The species is also known under the name "burdock". A source of medicinal raw materials, a honey plant used in cooking, in industrial production.
2. **Lesser burdock** - grows in Europe and those regions of Western Asia that are characterized by a temperate climate.
3. **Burdock felt (cobweb)** - found in Europe, Siberia, the Central Asian region, China. Refers to edible plants. The oil extracted from the roots is used in cosmetology. It forms hybrids without difficulty if it grows in close proximity with other species. <sup>[one]</sup>

Burdock is a biennial herbaceous plant, from 60 cm to 1 m in height and above. The root of the plant is elongated, fleshy, fusiform, up to 0.5 m long. The stems are erect, furrowed, strongly pubescent - woolly -webbed , branched in the upper part. The leaf arrangement is alternate, the basal leaves are very large, the upper ones are much smaller, ovate or heart-shaped-ovate, green above, gray felt below.

Lilac-purple flowers are collected in spherical baskets. Burdock blooms from July to September. The fruits of the achene ripen in September-October.

Burdock is a widespread weed plant. It grows in wastelands, along roads, in gardens, above river banks, in fields, near residential settlements, in weedy places, in places with high humidity (in floodplains, along the bottoms of beams), near hedges. Sometimes it forms small thickets, more often it grows in small groups or single specimens. <sup>[2]</sup>

### **Growing conditions**

Burdock reproduces productively by seed. Seeds are sown in autumn or spring; areas with soils unsuitable for the cultivation of other plants are suitable for sowing. The plant is completely unpretentious and does not require care. <sup>[3]</sup>

In the first year, only basal leaves are formed in the burdock, and in the second year the plant forms stems, the flowering period begins, and with the completion of fruit ripening, the burdock dies off.

The roots of plants of the first year of cultivation are harvested in the autumn, and the second year - in the spring. The dug roots are freed from the soil, the aerial part and thin roots are cut off. Separated thick roots are thoroughly washed in cold water and cleaned with a knife from the bark. Burdock root is dried in the open air, under sheds, spread out in a thin layer on burlap or paper.

The leaves are harvested in July-August and dried in shady places, in a draft. Seeds are harvested as they mature. The shelf life of raw materials from roots is 5 years, leaves - a year, seeds - up to 3 years. <sup>[four]</sup>

### **Power circuit**

Burdock roots are food for the hop worm larvae. Moths and butterflies also feed on burdock.

### **Video**

What ailments does burdock treat? Detailed recommendations from a phytotherapist . Recipe for ointment based on burdock root. How to cook burdock oil?

How and when to harvest burdock root? Procurement according to the rules.

All about the properties of burdock. Recipe for burdock balm on cognac with honey.

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[An extended HTML version of the article](#) is available on the website edaplus.info.

### **Burdock - useful properties, composition and contraindications**

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*Received 04.07.18*

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



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

**Key words:** mother and stepmother , useful properties, potentially dangerous effects, side effects, contraindications, diets

### Beneficial features

Table 1. The chemical composition of coltsfoot (according to [Food+](#) ).

| Main substances (g / 100 g): | Fresh feijoa [1] |
|------------------------------|------------------|
| Squirrels                    | 2.47             |
| Fats                         | 1.74             |
| <b>Minerals</b>              |                  |
| Potassium                    | 0.295            |
| Calcium                      | 0.463            |
| Magnesium                    | 0.228            |
| Sodium                       | 0.057            |
| Iron                         | 0.912            |
| Zinc                         | 0.0353           |
| Copper                       | 0.081            |

### What exactly is used and in what form

In the treatment of various diseases in the framework of official medicine and in the recipes of traditional healers, flower baskets and coltsfoot leaves are used, from which decoctions and infusions are prepared. The leaves and inflorescences of the coltsfoot are part of the nursing and diaphoretic herbal preparations. Fresh leaf juice is prescribed for both internal and external use. Leaf extract with syrup is used during rehabilitation therapy. Externally, coltsfoot is used in the form of lotions (prepare gruel from fresh leaves), compresses, rinses. <sup>[3]</sup>

### Medicinal properties

The leaves and flowers of coltsfoot contain triterpene saponins ( faradiol ), flavonoids (rutin, hyperoside ), bitter glycoside tusilagin , mucus, tannins, traces of volatile oils that act antibacterial and anticonvulsant , carotenoids ( taraxanthin dye ), silicon, malic and gallic acids, mineral salts, polysaccharides (inulin, dextrin). The flowers contain phytosterols . The leaves also contain sitosterol and the trace element zinc. <sup>[5]</sup>

**What is coltsfoot used for?** Basically , as an expectorant, emollient, anti-inflammatory, mild diaphoretic, choleric and weak antispasmodic. In scientific medicine, an infusion of coltsfoot leaves

is prescribed for laryngitis, tracheitis, chronic bronchitis, bronchopneumonia, bronchial asthma, and bronchiectasis.

The mother-and-stepmother justified itself as an effective disinfectant for abscess and gangrene of the lungs. In folk medicine, in addition, an infusion of leaves is recommended for fever, catarrh of the stomach, intestines and bladder, with an inflammatory process in the kidneys, dropsy, general physical exhaustion; to increase appetite and improve digestion in chronic enterocolitis.

Raw coltsfoot juice is considered an effective diaphoretic and choleric agent. Outwardly, an infusion of leaves is used for rinsing with sore throat, for douching with general diseases of the vagina, while enhancing the therapeutic effect by ingesting coltsfoot infusion in a tablespoon up to 6 times a day. <sup>[6]</sup>

### In official medicine

In the assortment of pharmacy products, you can find coltsfoot leaves, dry raw materials in packages of different weight values.

### In folk medicine

- **When the mucous membrane of the** upper respiratory tract is inflamed, tea from the coltsfoot is useful: a tablespoon of flowers is brewed in a glass of boiling water and allowed to brew for a quarter of an hour. Drink warm 100 ml twice a day.
- **As an expectorant and enveloping agent** in inflammatory processes of the upper respiratory tract, a decoction is recommended for children and elderly patients: a tablespoon of coltsfoot leaves is poured into 200 ml of water and boiled over low heat. Let it brew for 10 minutes. Take half a glass three times a day (for adults, this decoction should be given with the addition of other herbs). <sup>[5]</sup>
- **When coughing** , an infusion is prepared from a tablespoon of the mixture (take all herbs equally) of coltsfoot leaves, black elder flowers, tall and lime-colored mullein, rhizomes of couch grass and comfrey, brewed in a glass of boiling water. Withstand the infusion for at least 8 hours and take 50 g four times a day.
- **For liver diseases, rashes, spots on the body**, a tablespoon of a collection of coltsfoot flowers, rue grass and highlander (taken in proportions 5:3:10) is steamed in 200 ml of boiling water, let it brew for 10 minutes. Drink infusion in an amount up to 3 glasses per day.
- With pulmonary tuberculosis, freshly squeezed juice from the leaves of the coltsfoot is drunk for a long time, 4 tablespoons per day. <sup>[7]</sup>
- **When coughing, as an expectorant** , an infusion is advised: 2 tablespoons of a mixture of coltsfoot leaves, large plantain and licorice root (in a ratio of 3:2:2), pour 400 ml of boiling water, let it brew. Take 0.5 cup three times a day. <sup>[6]</sup>
- **With tonsillitis** , the composition is useful: leaves of coltsfoot, raspberry and sage, calendula flowers (all herbs equally), chop, mix. Steam a tablespoon of this collection in 200 ml of boiling water, let it brew for half an hour, strain and drink 100 ml of infusion three times a day.
- **For whooping cough and bronchiectasis**, take coltsfoot leaves and pine buds in equal parts. Grind the ingredients, mix well. Pour 2 tablespoons of the collection with a glass of cold water and let it brew for 2 hours. After boiling for 5 minutes, strain and drink 1/3 cup daily, observing the same intervals between doses.
- **For colds** , syrup is recommended. To prepare it, you will need: 2 cups of coltsfoot flowers, lemon juice (from 2 lemons), 1.5 liters of water, 1.5 kg of sugar. Peel the inflorescences from the receptacle, rinse thoroughly, pour boiling water over. Insist for a day. After the infusion, strain, pour the juice of 2 lemons into it, add granulated sugar and cook until it thickens. Pour the warm syrup into jars and store in a dark, cool place. For colds, add to tea, milk.

- As a **diuretic**, an infusion helps: prepare a collection of coltsfoot leaves, raspberries and oregano herbs (in a ratio of 2: 2: 1). Pour a tablespoon of this mixture in a thermos with 200 ml of boiling water and leave overnight. Strain the infusion. Drink hot before bed.
- **With duodenitis**, it is recommended to take coltsfoot with honey. Boil a tablespoon of dry coltsfoot leaf in 200 ml of boiling water. Allow to cool slightly, strain, add a tablespoon of honey. Reception up to three times a day, a tablespoon.
- **For diseases of the bladder**, mix a dry leaf of coltsfoot, bearberry and lingonberry (each herb should be taken equally). Brew and drink like regular tea.
- **Cough remedy**: 28 g each of coltsfoot leaves, fennel, veronica and 14 g of orris root. Mix the herbs, steam 3 tablespoons of the collection in 4 cups of boiling water, let it brew for 2 hours, strain and take a tablespoon every two hours. You can add some honey.
- **Remedy for sore throat and hoarseness**: 42 g of coltsfoot leaves, 56 g of marshmallow root, 28 g of licorice root, 14 g of orris root. Mix all the ingredients, steam 3 tablespoons of the herbal mixture in 4 cups of boiling water, let it brew for a quarter of an hour, then strain and bring to a boil again. Sweeten with honey and drink 2 cups daily. <sup>[3]</sup>

### Externally:

- Lotions with fresh juice (or crushed leaves of coltsfoot) treat purulent wounds, ulcers, abscesses.
- With hair loss and dandruff, accompanied by itching of the scalp, a strong decoction of coltsfoot and nettle leaves is recommended for washing (4 tablespoons of each herb per liter of water).
- With erysipelas, the affected areas are sprinkled with powder from the leaves of the coltsfoot. <sup>[7]</sup>
- For douching, a decoction is prepared from the leaves of the coltsfoot at the rate of 50 g of raw material per liter of water. Boil the broth for 5 minutes, strain, cool to the desired temperature. <sup>[6]</sup>
- For headaches, fresh coltsfoot leaves are applied with the smooth side to the forehead and temples.
- With rhinitis, the juice of fresh leaves is instilled into the nose.
- For colds, inhalation with coltsfoot and chamomile helps. A teaspoon of coltsfoot leaves and 2 teaspoons of chamomile flowers pour 0.5 liters of boiling water, boil for a couple of minutes, let cool to the desired temperature. Breathe over herbal steam for about 10 minutes.
- When mastitis begins, compresses are recommended from the leaves of the coltsfoot, soaked in hot milk.
- With bronchial asthma in children, it is advised to pour 40 dry leaves of coltsfoot with 0.5 liters of vodka. Leave the raw material overnight. On the first evening, put the leaf soaked in vodka on the back of the child. The next day, attach the sheet to the chest. So alternate treatment for more than a month.
- With thrombophlebitis, brew 3 tablespoons of chopped coltsfoot grass in 200 ml of boiling water, let it brew for half an hour, then strain. Use infusion for compresses.
- **Bath with coltsfoot**  
200 g of flowers and leaves of coltsfoot pour 3 liters of boiling water, boil the broth for a quarter of an hour, let it brew, strain and add to a full bath. <sup>[3]</sup>

### in oriental medicine

In Chinese medicine, coltsfoot flowers ( *kuan dong hua* ) are used to treat wet coughs accompanied by copious phlegm; to activate the lungs.

### In scientific research

Nicholas Culpeper in his herbalist ( The complete Herbal , 1653) indicated that "... fresh leaves, juice or syrup from coltsfoot are suitable for the treatment of hot dry cough, wheezing and shortness of breath." Also, according to the records of a British healer, coltsfoot remedies help with fever, erysipelas, burns and blisters. <sup>[eight]</sup>

The pharmacological and phytochemical aspects of the study are the aim of the scientific work of a group of Chinese scientists (Li K.Y., Tsang T.Zh. and others). <sup>[9]</sup>

Karomatov 's article is devoted to the medicinal potential of coltsfoot I.J. , Ibatova H.B., Amonova M. <sup>[10]</sup>

The composition of water-soluble polysaccharides contained in the leaves of the coltsfoot and the significance in antiallergic therapy was studied in the work of Korzh A.P., Guryev A.M., Belousov M.V. and others <sup>[11]</sup>

### **In cooking**

The coltsfoot flowers are edible. They are added to salads, honey is insisted on them. Dried flowers are added to the dough for pancakes or fritters, in pastries. Young leaves of coltsfoot are added to soups, salads, stews, after boiling them to get rid of bitterness. Dried and fresh leaves are used in herbal teas.

- Carrot salad with coltsfoot leaves

For the salad you will need: 50 g of fresh carrots, 30 g of coltsfoot leaves, 30 ml of kefir, salt to taste. Grate the carrots, rinse the coltsfoot leaves thoroughly under running water, chop, mix with carrots, season with kefir or yogurt without additives and salt.

- Sauerkraut and coltsfoot salad

Required products: 300 g of sauerkraut, 100 g of young leaves of coltsfoot, 40 ml of vegetable oil. Rinse the leaves of the coltsfoot, finely chop, mix with sauerkraut and season with vegetable oil.

- Soup with coltsfoot leaves

For the soup you will need: 100 g of fresh coltsfoot leaves, 200 g of potatoes, salt to taste, sour cream for serving. Cut the potatoes into slices, rinse the leaves of the coltsfoot well and chop finely. Boil potatoes until half cooked, add coltsfoot leaves, bring to a boil, remove from heat and let the soup brew. Salt to taste and serve with sour cream. <sup>[3]</sup>

- Honey with coltsfoot

Preparing such herbal honey is simple: separate the inflorescences of the coltsfoot from the cups, disassemble the inflorescences-baskets. Pour the prepared flower mass into a sterilized glass container and pour liquid honey to the top. Infuse honey in a warm place, on a windowsill well lit by sunlight, etc. Soak honey for 6 weeks. Then strain into a separate container and store in a cool place.

- Herbal lollipops with coltsfoot

Ingredients: 15 cups coltsfoot leaves, 5 cups water, 450 g sugar, 2 cups corn syrup, 3 tablespoons butter, a pinch of baking soda, a tablespoon vegetable oil.

Rinse the leaves thoroughly, put in a saucepan, pour water. Bring to a boil, cook for 3 minutes, then add sugar, corn syrup, butter and boil the mass over low heat until a drop of syrup thrown into cold water hardens into a tight ball (the so-called sugar syrup sample). Remove from heat, add soda, mix and beat with a mixer until a thicker and more viscous consistency. Lubricate a mold or a deep frying pan with vegetable oil and put the candy mass into it for solidification. Frozen candy layer split into pieces. These lozenges help relieve sore throats and coughing fits and are a great natural treat.

- Coltsfoot Wine by Monica Wilde

Required: 5-liter container filled with coltsfoot inflorescences, 5 liters of water, juice and zest of two oranges and one lemon, wine yeast (bag), yeast nutrition, 1 kg of sugar (for dry wine) or 1.6 kg of sugar (for semi-sweet wine).

Boil water, add sugar, cook over low heat until sugar is completely dissolved. Pour orange and lemon zest into hot syrup and cool to 21 °C. Add coltsfoot flowers, citrus juice, wine yeast and top dressing to the cooled syrup. Stir, cover tightly and leave in a warm place for a week. Stir daily. After a week, strain into a fermentation bottle. Keep the wine in a warm place for 3 months. After that, carefully (without lifting the sediment from the bottom), pour into a bottle, hold for another 2 or 3 months. Then bottled. <sup>[13]</sup>

Sorbet from French chef Marc Weir ( Tussilago Flowers Sorbet recipe from Marc Veyrat )

To prepare an exquisite recipe, you will need products: 30 fresh coltsfoot inflorescences, 125 g of sugar, 400 ml of mineral water, a little lemon juice, half the protein of one large egg.

Grind the inflorescences into a crumbling flower mass. Separate the flowers from the sepals. Boil water with sugar, add lemon juice. Pour coltsfoot flowers into boiling syrup , boil for 2 minutes. Strain through a sieve and let the flower syrup cool. Then add the egg white and beat thoroughly. After that , cool the sorbet in the freezer or ice cream maker. If the sorbet is prepared in the freezer, it must be periodically removed from the refrigerator and whipped to form the desired structure.

When serving, you can serve sorbet with fresh coltsfoot flowers and caramel threads. <sup>[12]</sup>

### **In cosmetology**

- Emollient herbal cream for dry skin

Ingredients: tablespoon of coltsfoot extract, 1 tablespoon of lanolin, half a cup of olive or corn oil, 1 tablespoon of fresh psyllium juice.

Mix lanolin and oil, stirring, gradually add plantain juice. Add coltsfoot extract, bring everything to a homogeneous state with a mixer or in a blender.

- Face masks with coltsfoot

### **Mask for oily skin**

Pour 2 tablespoons of dried and finely chopped leaves of coltsfoot with boiling water until gruel. Heat the mixture over low heat and let cool. Such a mask gives an anti-inflammatory effect, evens out the functioning of the sebaceous glands.

### **Mask for normal skin**

0.5 cups of fresh stems, 0.5 cups of kefir. Rinse the leaves, grind to a mushy state, mix with kefir. Apply a face mask. Wash off with warm water after a quarter of an hour.

### **Mask for dry skin**

Pour 2 tablespoons of finely chopped coltsfoot leaves into 200 ml of hot milk, let it brew, mix thoroughly, apply the mask on clean face skin. Wash off with water after a quarter of an hour.

For problematic skin, rashes, the following cosmetic recipe is effective. Steam 2 tablespoons of finely chopped coltsfoot leaves in 200 ml of boiling water and keep in a water bath for at least 5 minutes. Allow to cool, strain and mix the infusion with 2 tablespoons of vodka. Use this "lotion" to wipe the cleansed skin of the face, twice a day.

### **Wrinkle mask**

3 tablespoons of crushed coltsfoot leaf pour 100 ml of hot water. Keep the infusion for a quarter of an hour, then strain. Select 2 tablespoons of infusion, combine with 2 tablespoons of sour cream, bring to a homogeneous state, apply on clean face skin, for 20 minutes. Wash off the mask first with warm water, then with cool water.

- Hair rinse with coltsfoot

Useful coltsfoot for hair. To improve and strengthen them, prepare a decoction: burdock leaves and coltsfoot (in a ratio of 1: 1) pour water and boil in a water bath for 20 minutes. Rinse washed hair with warm decoction.

To strengthen thin and brittle nails, it is recommended to wipe them with a composition of lemon juice, coltsfoot juice and vitamin A oil solution.

- Bath for nails

Dissolve a tablespoon of sea salt in a glass of coltsfoot infusion. Keep your nails in this infusion for 10 minutes. Then gently wipe the nails dry and smear with a nourishing cream.

If the nails exfoliate, it is useful to make a mask: mix a teaspoon of any hand cream with a teaspoon of ground red feather and coltsfoot juice. Keep the mask on the nails for 5 minutes, then rinse. <sup>[3]</sup>

### **Other uses**

Dried and burned to an ashy state, coltsfoot leaves are used as a substitute for ordinary kitchen salt if it needs to be excluded from the diet due to a certain diet, etc.

Toothache is relieved by smoking special cigars made from powdered coltsfoot leaves. The smoke of such a cigar must be held in the mouth.

### **Dangerous properties of coltsfoot and contraindications**

Coltsfoot can cause an allergic reaction in people with intolerance to its components. With uncontrolled use and in large doses, the plant can have a toxic effect on the liver (due to the content of pyrrolizidine alkaloids in coltsfoot).

Coltsfoot drugs may increase the risk of bleeding. The risk group includes patients with various disorders, circulatory disorders and those who take medications that can provoke bleeding (anticoagulants, etc.). In this case, dosage adjustment is necessary.

Coltsfoot can increase blood pressure. The simultaneous use of coltsfoot drugs and drugs that affect blood pressure should be agreed with the attending physician and carried out with great care.

Patients taking calcium channel blockers should take coltsfoot only under the supervision of the attending physician, carefully and timely responding to possible changes in the condition. <sup>[fifteen]</sup>

### Botanical description

It is a perennial grass representing the family **Asteraceae** ( *Asteraceae* ).

### origin of name

Among the people, coltsfoot is also called *one-sided* , *double-leaved* , *two- faced* , *rannik* , *reed grass*, *cashew*, *podbel* , *mother grass*, *king-potion* . The Latin name of the genus - **Tussilago** - comes from the noun " *cough* " ( *tussis* ) and the verb " *drive away* ", " *cast out* ".

Why "mother and stepmother"? The answer lies in the fact that the structural features of the coltsfoot leaf caused the Russian version of the name to appear: the bottom of the plant's leaves does not evaporate moisture so intensively, because it is covered with many villi, and when touched it seems warmer and softer than the smooth upper part of the leaf, on cool touch. This made it possible to compare the plant with maternal warmth and the aloof, cold attitude of a stepmother.

The genus Coltsfoot is monotypic: it includes only one species. The habitat of the coltsfoot is extremely extensive: Eurasia, Eastern Siberia and the mountainous part of Southern Siberia, the Asia Minor region, northern Africa, the Arctic and North America. <sup>[one]</sup>

Coltsfoot is a perennial herbaceous plant, up to 0.2 m high. The rhizome is creeping, branched. The stems are erect, not branched, covered with small leaves in the form of purple-purple or brown scales, grow in early spring. The top of the stem is crowned with a single drooping basket inflorescence. The coltsfoot blooms before the leaves appear (from the second half of March to the beginning of May). The flowers are golden yellow, tubular in the middle of the inflorescence, reed - along the edge. After the end of the flowering period, the main, large basal, rosette-shaped leaves develop. They are round-heart-shaped, dense, white-felt below, with many thick, short villi, and bare above. The fruits of the achenes ripen in late April - early May.

Coltsfoot grows on sandy, wet clay, limestone and clay-chalk soils of slopes or hills, along railway embankments, in ravines, on the banks of reservoirs, along the edge of meadows, along clay cliffs, like a weed in vegetable gardens and fields. <sup>[2]</sup>

### Growing conditions

Coltsfoot is a moderately demanding plant for care conditions. It tolerates drought quite steadfastly, takes root on any type of soil, quickly takes root, gives a large number of new shoots, but grows best in areas located in shady places (under fruit trees with dense foliage, etc.). It propagates both by division of rhizomes and by seed. One plant can produce up to 17 thousand seeds. The seeds of the coltsfoot ripen quickly, are easily dispersed by the wind and, once in the soil, are able to germinate on the very first day. The coltsfoot successfully breeds and, with the help of planting rhizomes, which easily take

root in the ground, quickly grow and give dense thickets-sprouts. Annual top dressing of a plant with organic and mineral fertilizers in a complex is recommended. <sup>[3]</sup>

When harvesting grass, coltsfoots collect young, covered from underneath with thick, short white, felted villi, leaves that are not touched by rust. The leaves are cut along with the petiole or plucked. The time of collection of raw materials is May-June. The coltsfoot is dried on a paper or fabric base under a canopy, in places with good ventilation, scattering the leaves in a thin layer. The inflorescences-baskets of the coltsfoot are harvested in April-early May, plucking them or cutting them along with peduncles no more than 0.5 cm long. They are harvested in the same way as the leaves. The shelf life of leaves and inflorescences is 3 years.

Herbalists with little experience often confuse the plant with burdock and other members of the Aster family (Asteraceae) when collecting coltsfoot leaves. Herbs can be distinguished by a combination of external signs. When collecting coltsfoot inflorescences, in some cases, dandelion officinalis flower material is mistakenly collected. It is also necessary to distinguish coltsfoot from similar species - felt podbel, white podbel and hybrid podbel. One of the main distinguishing features can be leaf venation: in the named species of podbel it is pinnate, and in coltsfoot the lower part of the leaf is white-tomentose with three bundles of veins extending like a fan. One of the significant differences can be attributed to the peculiarity of the inflorescences: the inflorescence-basket is white with a bell-shaped wrapper, while the coltsfoot basket has a cylindrical wrapper.

It is important to remember that the collection of raw materials is possible only in uncontaminated areas located at a sufficiently large distance from highways. Plants growing along roadsides are often poisoned by accumulated salts of heavy metals. <sup>[2]</sup>

## Power circuit

The coltsfoot serves as a food source for the larvae of many Lepidoptera species.

## Video

What ailments does coltsfoot treat? Infusion of coltsfoot: recipe and cooking tips.

Mother and stepmother with bronchitis, cystitis, joint diseases: a commentary by a phytotherapist .

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### **Tussilágo - useful properties, composition and contraindications**

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*Received 05.08.18*

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



### **Cucumber (Cucumis sativus)**

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**Abstract.** The article discusses the main properties of cucumber 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 plant are indicated, the use of cucumber in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially

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

**Key words:** cucumber , beneficial properties, potentially dangerous effects, side effects, contraindications, diets

## Beneficial features

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

| 100 g of fresh cucumbers with peel contains [10]:    |        |            |          |            |       |
|------------------------------------------------------|--------|------------|----------|------------|-------|
| Main substances:                                     | G      | Minerals:  | mg       | Vitamins:  | mg    |
| Water                                                | 95.23  | Potassium  | 147      | Vitamin C  | 2.8   |
| Carbohydrates                                        | 3.63   | Phosphorus | 24       | Vitamin PP | 0.098 |
| Sugar                                                | 1.67   | Calcium    | 16       | Vitamin B6 | 0.040 |
| Squirrels                                            | 0.65   | Magnesium  | 13       | Vitamin B2 | 0.033 |
| Alimentary fiber                                     | 0.5    | Sodium     | 2        | Vitamin E  | 0.03  |
| Fats                                                 | 0.11   | Iron       | 0.28     | Vitamin B1 | 0.027 |
| calories                                             | 15kcal | Zinc       | 0.20     | Vitamin K  | 0.016 |
| 100 g of fresh cucumbers without peel contains [11]: |        |            |          |            |       |
| Main substances:                                     | G      | Minerals:  | mg       | Vitamins:  | mg    |
| Water                                                | 96.73  | Potassium  | 136      | Vitamin C  | 3.2   |
| Carbohydrates                                        | 2.16   | Phosphorus | 21       | Vitamin B6 | 0.051 |
| Sugar                                                | 1.38   | Calcium    | fourteen | Vitamin PP | 0.037 |
| Alimentary fiber                                     | 0.7    | Magnesium  | 12       | Vitamin B2 | 0.025 |
| Squirrels                                            | 0.59   | Sodium     | 2        | Vitamin B1 | 0.031 |
| Fats                                                 | 0.16   | Iron       | 0.22     | Vitamin E  | 0.03  |
| calories                                             | 10kcal | Zinc       | 0.17     | Vitamin B9 | 0.014 |
| 100 g of pickled cucumbers contains [12]:            |        |            |          |            |       |
| Main substances:                                     | G      | Minerals:  | mg       | Vitamins:  | mg    |
| Water                                                | 94.08  | Sodium     | 1208     | Vitamin C  | one   |
| Carbohydrates                                        | 2.26   | Potassium  | 23       | Vitamin B2 | 0.010 |
| Sugar                                                | 1.06   | Phosphorus | fourteen | Vitamin E  | 0.09  |
| Alimentary fiber                                     | 1.2    | Magnesium  | four     | Vitamin K  | 0.047 |
| Squirrels                                            | 0.33   | Iron       | 0.40     | Vitamin B6 | 0.009 |
| Fats                                                 | 0.20   | Zinc       | 0.02     | Vitamin B9 | 0.001 |
| calories                                             | 11kcal | Calcium    | 0        | Vitamin A  | 0.01  |

It is most useful to eat cucumbers together with the peel, which contains many useful substances. However, even without peel, and pickled, cucumbers retain some useful properties. True, it should be borne in mind that in a salted or pickled form, the level of sodium in them jumps sharply, which can adversely affect the health of people suffering from kidney failure. At the same time, the proportion of vitamins decreases, the level of potassium, magnesium, zinc and calcium decreases. And too much salt can lead to the destruction of tooth enamel, fluid retention in the body and disruption of the digestive tract.

## Medicinal properties

Cucumber is inferior to many vegetables in the content of vitamins, since it consists almost entirely of water. However, cucumber water is rich in mineral salts and biologically active substances. For example, cucumber fruits contain enzymes that promote the absorption of proteins and B vitamins, as well as maintaining a normal blood reaction. What's more, cucumbers contain an insulin-like enzyme, making them an important staple in the diet of diabetics.

In addition, cucumber water helps to cleanse the body by dissolving toxins. That is, the cucumber should not be used as a standalone food, but it plays a significant role in the absorption of other foods, such as meat. Due to its low calorie content, cucumbers are recommended for people prone to obesity.

Although in small quantities, cucumbers contain phosphorus, potassium, calcium, sulfur, magnesium, sodium, iron, zinc and iodine (in an easily digestible form). Due to this, they have choleric and diuretic properties, help improve the activity of the cardiovascular system, and are recommended for people suffering from thyroid diseases. In addition, such a set of trace elements improves the condition of nails, hair, human teeth and reduces the acidity of gastric juice. By the way, the fiber that is part of cucumbers has the best effect on the digestion process. A mild laxative effect helps to get rid of constipation.

As for vitamins, cucumbers boast the presence of carotene, thiamine, riboflavin, folates, etc. in their composition. The latter are actively involved in regulating the level of homocysteine, an amino acid that is formed in the body during metabolism, and increases the risk of atherosclerotic vascular damage and thrombosis.

Another useful component of the cucumber is phytosterol (phytosterol) - a steroidal alcohol that does not dissolve in water. In fact, we are talking about a vegetable counterpart of cholesterol. Its advantage is that it is safe for humans and does not provoke the development of atherosclerosis. Once in the body, phytosterol inhibits up to 10% of cholesterol absorption and instead enters the blood without causing any harm to the body.

### **Use in medicine**

In traditional medicine, cucumber, despite the presence of useful elements and properties, is not used and is not considered a pharmacopoeial plant. Nevertheless, green fruits have been actively and successfully used in folk medicine and cosmetology for a long time.

Firstly, the simplest popular use of cucumber is external. When receiving small burns, abrasions or wounds, it is recommended to attach a cut cucumber to the damaged area or lubricate this place with fresh cucumber juice. This guarantees a powerful antimicrobial effect (even in case of suppuration). Secondly, various decoctions, infusions are prepared on the basis of cucumber, compresses are made from them. Moreover, not only the fruits themselves and the juice are put into circulation, but also the flowers, leaves and lashes of the plant (usually in dried form).

- **Decoctions and infusions**

A decoction of fresh cucumbers can help get rid of edema that has appeared due to heart pathologies or varicose veins. To do this, finely chop 100 g of washed cucumber, pour 200 ml of boiling water over it and cook over low heat for 5 minutes. Half a glass of this decoction should be drunk before meals three times a day for 7-10 days.

In case of jaundice, it is recommended to grind 50 g of ripe cucumbers and 20 g of dry leaves of the same plant. Pour this mass with 500 ml of water and boil in a bath for 20 minutes. Then filter the resulting decoction and take 4 times a day for 14 days.

With malaria and fevers, a decoction of cucumber flowers is considered an effective method. 1 tablespoon of dried flowers should be poured with 250 ml of hot water and boiled over low heat for 10 minutes. Then strain through cheesecloth and divide the portion into three equal parts, which should be taken three times a day for 10 days.

Traditional healers believe that cucumber is useful for hemorrhoids. To alleviate the condition of patients, it is recommended to pour green fruits with lightly salted water and leave in the refrigerator. For 14 days, drink this brine one glass between meals (3 times a day). To get rid of uterine bleeding, it is advised to pour 70 g of dry cucumber stems into 500 ml of water and cook in a water bath for 20 minutes. Let the broth brew for 2 hours, and then strain. Drink half a glass 3 times a day for 5 days.

Finally, cucumber tincture is considered an effective means of combating trophic ulcers. To prepare it, grind 100 g of cucumber seeds (from ripe fruits) in a blender and pour them with a glass of water. Infuse the mixture in the dark for 10 days, shaking it regularly. Strain before use. Next, moisten gauze swabs and apply them to the ulcer for 30 minutes. Cucumber seeds are also useful for relieving pain when urinating. A tablespoon of ground seeds should be poured with 600 ml of water and insisted in a thermos for 2 hours. Drink this tincture, adding honey to taste, three times a day for a week.

- Juice

Cucumber juice is considered a cleansing agent that helps dissolve toxic substances in the body. Also, traditional healers claim that it is effective in the fight against small kidney stones and uric acid crystals. In addition, it is believed that it quenches thirst well, has a positive effect on the nervous system and strengthens memory.

Cucumber juice has diuretic and laxative properties. For such purposes, it is necessary to take 3 tablespoons 3 times a day. A mixture of cucumber juice and carrot juice is recommended for rheumatic diseases. And along with honey, cucumber juice is used to get rid of coughs and stomach pains. For 100 ml of juice, one tablespoon of honey is usually taken. It is necessary to drink such a remedy one tablespoon three times a day.

### **in oriental medicine**

According to the effect that the product has on the body, once inside, oriental medicine classifies the cucumber as a cold product. Food with cold properties has an antipyretic effect, cleanses the body and slows down energy metabolism. In the East, products are also divided by color, each of which corresponds to a specific organ. Green vegetables actively interact with the liver, removing the load from it. In addition, cucumber is believed to help relieve both physical and mental stress and prevent headaches.

In Indian Ayurveda, cucumber is also valued for its cooling qualities. Even in tropical climates, this vegetable can keep temperatures up to 20 degrees cooler than in the environment. Even in ancient times, cucumber was used to treat poor eyesight and diabetes. With its help, they lowered the pressure, they also saved themselves after being bitten by scorpions. Now in India, oil is made from cucumber, which has a wide range of applications. It treats constipation and diseases of the urinary system, duodenal ulcer and rheumatism, erectile dysfunction and vaginal infections. In addition, it is considered effective against dandruff, sunburn, and dark circles under the eyes<sup>[13]</sup>.

### **In scientific research**

Cucumber is very popular around the world, grows in a variety of climatic conditions, so it is not surprising that it becomes the object of scientific research. Basically, scientists are improving the

existing methods of planting (terms and schemes), growing, harvesting and storing cucumbers. Breeders are engaged in the development of new, more disease-resistant varieties.

So, it turned out that the origin of their paternal and maternal forms affects the yield and quality of hybrid cucumbers. For the best harvest, it is recommended to involve forms from the Asian eco-geographical group in the breeding process <sup>[14]</sup>.

As for the storage of greenhouse cucumbers, under adverse conditions, the development of pathogenic fungi is often observed. Scientists have found that an increase and decrease in temperature, from 12-14 ° C, which are considered the norm, lead to an increase in the infection of cucumbers during storage. An important factor is also the method of packing and the gas composition of the atmosphere <sup>[15]</sup>.

Scientists have also achieved success in scientific and technical research. Now it is not necessary to use soil to grow cucumbers, an alternative method has appeared - the installation of a multi-tiered hydroponic installation, which allows you to grow vegetables based on nutrient solutions. Now new forms of cucumbers are being developed, more adapted to new equipment <sup>[16]</sup>. Also, the first two-armed robots have recently been launched, which perform the function of automatic picking of cucumbers <sup>[17]</sup>.

Finally, recently the cucumber appears not only in agricultural research, but also in medical research, since scientists have come to the conclusion that the cucurbitacin glycoside contained in the vegetable has the ability to suppress the vital activity of cancer cells <sup>[18]</sup>.

## **Weight regulation**

Considering that the cucumber consists almost entirely of water, it is considered a dietary product. Its main value is low calorie, but at the same time it also slows down the process of converting carbohydrates into fats and helps proteins to be absorbed. It should also be noted that there are useful mineral elements and vitamins that have a positive effect on the functioning of the kidneys, liver, heart, and help strengthen blood vessels.

Some nutritionists recommend that people who want to lose weight or cleanse the body of toxins have fasting cucumber days in the summer. This should be done no more than once a week and on this day you should minimize physical activity as much as possible. For a day you need to eat about 2 kg of fresh cucumbers. However, you need to be careful with salted or pickled cucumbers. Their excessive use leads to the ingestion of excess salt in the body.

## **In cooking**

Cucumbers are actively used in cooking, adding them to salads, soups, various snacks and sauces. They are also salted, canned and pickled. In order to select the right cucumbers for your purpose, you should know that breeders separate them by the shirt - the surface of the cucumber. There are 3 main types of shirts: Slavic - with rare spikes on the surface (the marinade penetrates slowly, which makes the vegetable elastic and crispy), German - with densely spaced spikes (the pickle gets inside quickly) and Asian - with a smooth surface and thick skin - are good for salads).

When adding cucumbers to a salad, housewives often encounter the fact that the vegetable is bitter. Such bitterness is provoked by the glycoside cucurbitacin, which appears in the cucumber after a stressful situation (lack of water, excess sun, too high a temperature). Bitter cucumber does not bring any harm to the body, on the contrary, it is believed that cucurbitacin is involved in suppressing the functioning of cancer cells. But in order to still avoid buying bitter vegetables, you do not need to take too thick cucumbers with a thick skin and a dark green edge.

Interestingly, instead of cucumber in cooking, you can use borage cucumber grass (for example, in the season when there are no fresh cucumbers). This herb has a high nutritional value and contains vitamins. It tastes like cucumber with onions.

### **Combination with other products**

Cucumbers go well with almost all foods except tomatoes. Once in the body, tomatoes form an acidic environment around them, and cucumbers form an alkaline one. As a result, this combination leads to the formation of salts, which negatively affects the functioning of the kidneys. Also, ascorbic acid, which is found in tomatoes, is not absorbed due to the cucumber enzyme ascorbinase, as a result of which the body receives less vitamin C. But it is very useful to eat cucumbers with meat, as they contribute to the absorption of protein.

### **Beverages**

Cucumber juice has a lot of useful properties, so it is recommended to drink it in its pure form. However, due to the refreshing effect that cucumber has, it is often added to various summer drinks. For example, a lime and watermelon cocktail (200 g of watermelon pulp, 1/2 lime, 1/2 cucumber, a bunch of mint and water) or a spinach and celery smoothie (grind in a blender: 100 g of spinach, 1 green apple, 1 cucumber, 1 stalk of celery, 1 piece of ginger, 2 tbsp lemon juice). Cucumber water is also popular (1 cucumber, 1 bunch of mint, half a lemon, 1 liter of water).

### **In cosmetology**

Cucumber is considered a good cosmetic product that has a refreshing and rejuvenating effect on the skin. Thanks to phytosterol, moisture is retained and there is a slight lifting effect. And alkaline salts provide nutrition to the skin and have a whitening effect, removing plaque.

Now there is a huge selection of all kinds of masks, lotions, tonics, gels based on cucumber, but in the summer you can prepare a cosmetic product at home.

In order to refresh the skin of the face after overwork, lack of sleep or stress, you need to take 1 cucumber and 1 chicken protein. You should grate the cucumber on a fine grater and take 2 tbsp. gruel, combining them with egg white whipped to foam. Then apply the mask on the face for 15 minutes and rinse with water. And for the skin around the eyes, it is recommended to mix 2 tbsp. grated cucumber with chopped parsley.

To achieve a rejuvenating effect, you need to mix 1 tbsp. grated cucumber with 1 tsp. white clay. A moisturizing effect is given by a mask prepared from 1 tbsp. grated cucumber, 1 tsp. chopped mint and 1 tsp. chopped basil.

### **Dangerous properties of cucumbers and contraindications**

Cucumbers are a dietary product, but even they can sometimes harm the body. It is recommended to refuse their use in such cases:

- exacerbation of stomach ulcers;
- acute and chronic gastritis and enterocolitis;
- acute and chronic nephritis and pyelonephritis, as well as hepatitis and cholecystitis (you should avoid eating pickles);
- feeding the baby (may cause indigestion and colic in the baby).

## Story

Cucumber is considered one of the oldest representatives of vegetable crops, which appeared four thousand years ago. Although there are bold assumptions that the cucumber is already more than 6 thousand years old. There is no unequivocal information about the homeland of this vegetable, but most likely it was the tropical and subtropical regions of Ancient India and China. We can definitely say that initially the cucumber grew wild. Only in the second millennium BC. the ancient Indians cultivated it and gradually introduced it into their diet <sup>[1]</sup>.

Thanks to the increase in cultivation volumes and established trade relations, the cucumber went to conquer the world from India and China. That is how he got to Egypt, Ancient Greece, and much later to the Roman Empire. There is reason to believe that it was from the Greek name of this green vegetable " ἄγουρος " (goes back to " ἄωρος " - unripe) that the word "cucumber" came from. By the way, the English name " cucumber " comes from the French word " concombres ", which, in turn, was borrowed from the Latin language (" cucumis ") <sup>[2]</sup>.

The fact that in ancient times the cucumber was an important part of the diet of people is evidenced by its images on frescoes in Greek and Egyptian temples. In addition, the beneficial properties of this crunchy vegetable were described by Aristotle and Hippocrates. In ancient Rome, cucumbers were eaten by both the elite classes and the lower classes. And the emperor Tiberius ordered to serve him one cucumber every day of the year. Then cucumbers began to be grown in boxes on wheels so that they could be moved following the sunlight. It is believed that the first salting recipes appeared at the same time.

From the Roman Empire, the cucumber spread throughout Europe (in France - from the 9th century, in England - from the 14th century). In the 15th century, thanks to Columbus, the cucumber reached the shores of the New World, where it also quickly gained popularity among the locals. However, at the beginning of the XVII century. in America, information appeared that eating raw vegetables and fruits is dangerous to health, so the cucumber lost its position for some time and received the mocking nickname " cowcumber " (English cucumber for feeding cows). Only about a hundred years later, the green vegetable returned to the tables of Americans <sup>[3]</sup>.

It is not known for certain when and how the cucumber came to Russia. There is a theory that this vegetable came to us from Europe after the baptism of Russia. Although some scientists believe that our merchants bought cucumbers in East Asia as early as the 9th century. In any case, one of the first written references to this vegetable dates back to the first half of the 17th century. (Notes of the German traveler Elschleger ). At the same time, Peter I issued a decree on the cultivation of this crop in the royal garden. It was then that the first greenhouses began to appear.

## How to choose

In the summer, it is better to buy cucumbers in the morning, before they lose their freshness, lying in the sun. If the cucumbers have already faded a little, then you can "revive" them by leaving them in cool water for 2-3 hours. By the way, soaking in cold water (about 30 minutes) helps to remove nitrates. To heighten the effect, put the cucumbers in a transparent bowl and leave in a bright place (the sun's rays help accelerate the removal of harmful substances).

Buy cucumbers should be dense, without visible damage and yellow spots. When buying cucumbers out of season, you should pay attention to the unnatural shine. Imported vegetables are often covered with a thin layer of paraffin during transportation for better preservation. In this case, before eating the vegetable, it is necessary to cut the peel. And if there are no seeds inside at all, then it is better to throw away such a cucumber, due to the presence of a large amount of hazardous substances in it.

In general, the choice of cucumbers depends on your purpose. Almost all cucumbers can be used for salad, but specially bred smooth fruits with a thick skin, about 13 cm long, are considered the most suitable. They have a rich aroma. You can take cucumbers with white spikes.

The best pickled cucumbers are obtained from fruits 9-12 cm long with dark spikes (they are easily removed when washed, which allows the brine to intensively soak the cucumber). For pickling, it is recommended to take cucumbers up to 9 cm in size ( short- fruited gherkins) of a dark green color with light tips or light stripes on the side. Fruits with dark thorns are also suitable.

### **How to store**

As for the storage of fresh cucumbers, they can usually be stored in the refrigerator for about 3-5 days. It is important to keep them well ventilated and not store them near ripe fruits and vegetables. To increase the shelf life up to 10 days, they are placed in a plastic bag, covered with wet gauze on top and sent to the refrigerator. Cucumbers wrapped in paper towels and placed in an open bag can be stored in the refrigerator for about two weeks <sup>[7]</sup>. In order for the vegetables to remain fresh for 3-4 weeks, they are dipped in tails in cool water by 1-2 cm and put in the refrigerator. The water in the tank must be changed every day.

### **Varieties**

Despite the fact that cucumbers need a set of certain conditions for normal ripening, thanks to the efforts of breeders, they are now cultivated in different climatic zones and on soils of different composition. The main thing is to choose the right variety.

Depending on the ripening time, cucumbers are divided into early-ripening, ripening up to 45 days (cupid, artist, Hector, Masha), mid-ripening, ripening up to 50 days (competitor, non-female, table, mother-in-law), and late ripening, ripening more than 50 days (phoenix , Aquarius, Alice). There is also a division of cucumber varieties according to their intended use: for fresh consumption, for pickling or preservation, and universal, suitable for both purposes.

Interestingly, the oblong green vegetable known to us has many exotic relatives that are considered its varieties. For example, the African Kiwano cucumber has a yellow skin with thorns and juicy green flesh, slightly reminiscent of our traditional cucumber. The dragon egg is distinguished by its smoothness and light color of the shell, rounded shape and sweetish taste. And Red Hmong cucumbers turn red when ripe, and taste a bit like melon.

A cucumber called Gak or Spring Bitter has an orange-red skin and soft red flesh. It contains a high amount of antioxidants, which makes it very useful, however, it does not tolerate transportation well, so it can only be found in places where it is grown <sup>[4]</sup>. There are also decorative wild cucumbers, which are also popularly called hedgehogs. They braid hedges and fences, and their fruits are covered with needles. The peculiarity of these cucumbers is that at the time of ripening, the peel on the fruit stretches as much as possible and bursts. At the same time, seeds and a little mucus fly out of two small holes under pressure.

### **Growing features**

Cucumber is a vine -like plant with a creeping stem that can reach two or more meters in length. Lateral shoots and tendrils depart from the main stem, with the help of which the plant can be fixed on supports, taking a vertical position. Thanks to this, it is possible to grow cucumbers on trellises (usually this method is used in greenhouses and on balconies), although if space in the garden / bed

allows, then the stem is allowed to spread along the ground. The length and degree of branching depends on the variety <sup>[5]</sup>.

During flowering, male (with stamens) and female (with pistils) yellow flowers are formed on the plant. Female flowers differ in that there is an ovary under them and they are located singly or in 2-3 pieces on lateral shoots, while male flowers (empty flowers) form inflorescences of 5-7 pieces mainly on the main stem. Fertilization occurs mainly during the opening of flowers (1-2 days). The pollen is carried by bees and other insects, which are attracted by the bright yellow color and the presence of nectar.

In the case of cold weather or in greenhouse growing conditions, the pollination process becomes more complicated - it is done manually, so breeders began to breed hybrids. They are obtained by artificial pollination of flowers of different varieties. In its name, the hybrid must have a distinctive symbol - F (filli - Italian children) and a number that indicates the generation number. Moreover, in our time, cucumbers have appeared that do not require pollination at all - parthenocarpic, as well as self-pollinated - their flowers have both a stamen and a pistil at the same time <sup>[6]</sup>.

Cucumbers usually begin to be harvested when the fruits are not yet biologically ripe, which is why they are called greens. To ripen and acquire a yellow-brown hue is given only to those cucumbers from which seed material is taken for planting or for selection.

Planting cucumbers can be carried out both seedlings and seeds. Usually seedlings provide an earlier harvest, but also require more attention. After planting on the beds, young plants need to be wrapped in case of a drop in temperature. In general, cucumber is a heat-loving, moisture-loving and light-loving plant that does not tolerate drafts (note to those who grow vegetables at home on windowsills). It is recommended to plant cucumbers at a distance of at least 20 cm from each other to a depth of 2-2.5 cm in the second or third decade of May (at a temperature of 18 to 25 ° C).

Among the main cucumber pests, a spider mite stands out, which settles on the underside of the leaves and feeds on their juice, which leads to the appearance of white dots on the leaves, and then, braided with cobwebs, they dry out. Cucumbers are also afraid of melon aphids, which live on all parts of the plant and suck out its juices. After that, the leaves begin to turn yellow and die. The cucumber mosquito is also dangerous, whose translucent larva with a black head is introduced into the stem and root of a weakened plant, after which it dies.

Chemicals are commonly used to control pests. However, in order to prevent harmful insects from entering the plant, regular weeding should be done to remove weeds.

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### **Cucumber - useful properties, composition and contraindications**

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*Received 08/05/18*

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



### **Banana (Musa)**

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

**Keywords:** banana, beneficial properties, potentially dangerous effects, side effects, contraindications, diets

## Beneficial features

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

| 100 g of fresh dessert bananas without peel contains [7]: |        |            |      |            |       |
|-----------------------------------------------------------|--------|------------|------|------------|-------|
| Main substances:                                          | G      | Minerals:  | mg   | Vitamins:  | mg    |
| Water                                                     | 74, 91 | Potassium  | 358  | Vitamin C  | 8.7   |
| Carbohydrates                                             | 22.84  | Magnesium  | 27   | Vitamin PP | 0.665 |
| Sugar                                                     | 12.23  | Phosphorus | 22   | Vitamin B6 | 0.367 |
| Alimentary fiber                                          | 2.06   | Calcium    | 5    | Vitamin B2 | 0.073 |
| Squirrels                                                 | 1.09   | Sodium     | one  | Vitamin A  | 0.064 |
| Fats                                                      | 0.33   | Iron       | 0.26 | Vitamin B1 | 0.031 |
| calories                                                  | 89kcal | Zinc       | 0.15 |            |       |
| 100 g of fresh yellow plantains contains [8]:             |        |            |      |            |       |
| Main substances:                                          | G      | Minerals:  | mg   | Vitamins:  | mg    |
| Water                                                     | 65.20  | Potassium  | 487  | Vitamin C  | 18.4  |
| Carbohydrates                                             | 31.89  | Magnesium  | 36   | Vitamin PP | 0.672 |
| Sugar                                                     | 17.51  | Phosphorus | 32   | Vitamin B6 | 0.242 |
| Alimentary fiber                                          | 1.7    | Sodium     | four | Vitamin B2 | 0.076 |
| Squirrels                                                 | 1.30   | Calcium    | 3    | Vitamin B1 | 0.062 |
| Fats                                                      | 0.35   | Iron       | 0.55 |            |       |

So, a fresh banana is not very fatty, but a very nutritious and energetically valuable product. As for plantains, which require heat treatment before consumption, they are rich in the same minerals and vitamins as dessert bananas. Baking such fruits allows you to save their beneficial substances, but frying reduces the amount of vitamins and makes them fatter and more nutritious.

## Medicinal properties

Despite the fact that a banana is 75% water, it contains many useful components. For example, this tropical fruit is very rich in potassium, and thus helps the body maintain a healthy heart and kidneys, as well as enhances attention and activates the brain. Scientists claim that a sufficient amount of this mineral in the body prevents the formation of kidney stones, contributes to the normalization of blood pressure and reduces the risk of a heart attack by 27% <sup>[11]</sup>. Magnesium in combination with vitamins C and B6 also has a positive effect on the functioning of the heart.

In addition, a banana is recommended for diarrhea. By itself, the fruit will not solve the problem, but it will certainly help restore the level of potassium that is washed out of the body during an upset stomach <sup>[12]</sup>. Bananas also contain dietary fiber, which supports normal bowel function and plays an important role in preventing colorectal cancer. By the way, the antioxidants in bananas can help reduce the damage from free radicals, which scientists believe contribute to the development of cancerous tumors.

Banana is considered an effective assistant in the fight against ulcers, since it contains substances that resist the bacteria that cause this disease. It also has an antacid effect (reduces irritation of the mucous membrane, soothes the digestive system) and envelops the walls of the stomach.

Bananas are useful at any age, but are especially important at a very early stage of life. So, puree from this tropical fruit usually becomes almost the first meal of the baby after mother's milk. As a rule, a banana does not cause allergies and provides the child's body with useful substances. Moreover, according to the observations of British scientists, if children eat one banana every day, then their risk of developing asthma is reduced by 34% <sup>[12]</sup>.

The use of this tropical fruit also benefits the organs of vision. Despite the fact that carrots are usually associated with a positive effect on the eyes, bananas also contribute to the fight against macular degeneration (retinal damage and impaired central vision), due to the presence of vitamin A in their composition.

Calcium is found in bananas in not very large quantities, but it still helps to strengthen bones. In addition, certain non-digestible carbohydrates increase the body's ability to absorb calcium from other sources.

Finally, bananas are often and not in vain associated with the product for athletes. Minerals and fast carbohydrates saturate the body and charge with energy and strength for a rich workout. In addition, some scientists believe that bananas help reduce muscle cramps and relieve sore throat. However, this effect has not been scientifically proven.

In the same way, the effect of bananas on a person's mood has not been proven. The antioxidant dopamine, obtained from a banana, does not affect the hormonal background, so you should not associate its entry into the body with an improvement in mood. And in the case of the amino acid tryptophan, which in the body is transformed into the neurotransmitter serotonin ("the hormone of good mood"), its amount in a banana is so insignificant that it can hardly affect mood.

## **In medicine**

Although bananas are not used in the pharmaceutical industry, they certainly have medicinal properties that are actively used in traditional medicine. In tropical countries, where a banana is considered one of the main components of the daily diet, not only the pulp of the fruit, but also the rest of the plant (roots, leaves, flowers, fruit peel) is used to treat various diseases. For example, it is believed that an infusion of flowers helps with diabetes, ulcers and bronchitis, roots - with disorders of the stomach, dysentery, and leaves - with skin wounds and burns <sup>[13]</sup>. In our area, the use of banana for medicinal purposes is mainly limited to the use of the fruit and its peel.

- Drinks and infusions

With bronchitis, in combination with drug treatment, it is recommended to drink a honey-banana drink. To prepare it, peel and mash 3 ripe bananas, pour 400 ml of boiling water over them, and let the

mixture brew for about 30 minutes. In the cooled remedy, you need to add 2 tablespoons of honey and drink half a glass 4 times a day for 5 days.

A chocolate-banana drink can help get rid of a sore throat. It is necessary to mash 1 ripe banana and add 1 tablespoon of cocoa powder to it. Then dissolve the resulting mixture in 1 cup of boiled milk. Take the remedy at bedtime for 5 days.

To combat dry cough, it is advised to mash one ripe banana, add 100 ml of orange juice, 200 ml of boiling water, 1 tablespoon of honey and cinnamon to taste. Means to use for 5-7 days. And if you brew a whole banana with a peel like tea, adding a little cinnamon, then a cure for insomnia will come out.

Traditional healers claim that 1 mashed banana, poured into a glass of milk, can help the body cope with mild allergic reactions. The drink should be consumed 2-3 times a day. And if you add a little honey to this mixture, you get a good cure for a hangover.

Finally, banana kvass is considered to help the body with arrhythmias. To prepare it, put 2 cups of chopped banana peel in gauze and pour 3 liters of boiled water. Then add 1 tablespoon of sour cream, a glass of sugar and insist 12 days. A thin layer of mold may form on the surface of the liquid, which must be removed immediately. After 12 days, 1 liter of kvass can be poured and filtered through gauze, and the remaining one can be added with 1 liter of water and a third of a glass of sugar, leaving it to infuse for a few more days. It is necessary to drink kvass half a glass 2 times a day before meals.

- Applications

Banana peel, less often banana pulp, is used as an appliqué. The inside of the skin acts as a natural antiseptic, and thanks to tannins and wax, it can help stop bleeding. In addition, the oils in its composition help relieve pain and itching. Thus, you can apply the peel or pulp, carefully scraped off with a knife, to scratches, abrasions, calluses, bruises, burns, insect bites. Folk recipes also suggest regularly applying a banana peel to warts. The result should be noticeable after 3-4 weeks.

### **in oriental medicine**

In Eastern practice, a banana is considered a useful product and is used for various purposes. Particular attention is paid to the ripeness of the fruit, because this greatly affects its medicinal properties. For example, with ripening, a protein appears in a banana that is involved in preventing the development of cancerous tumors. Conversely, an unripe banana contains resistant starch (dietary fiber), which, according to Indian doctors, improves the condition of diabetes.

Oriental medicine also considers banana an effective means of cleaning blood vessels. This fruit contains phytosterols that help lower cholesterol levels. According to one of the recipes, pour 50 g of mashed banana into a cup of tea and add 2 teaspoons of honey. This remedy should be taken in the morning and evening.

In addition, in Eastern practice it is not customary to combine a banana with milk, as is often done in the West. It is believed that such a compound negatively affects the digestion process, can provoke allergies, and can also cause seemingly completely unrelated cough and runny nose <sup>[14]</sup>.

### **In scientific research**

Since the banana has a lot of useful properties and is the main part of the diet in many tropical countries, it has long been the object of scientific research. Scientists are looking for ways to make this fruit more resistant to various diseases, as well as studying its potential as a medicinal product.

For example, a 10-year humanitarian project by a group of Australian researchers recently completed with success, the goal of which was to develop bananas rich in provitamin A. This task was set for scientists due to the fact that in Uganda and several other African countries, hundreds of thousands of children die or become blind due to a lack of this vitamin in the body. Now the problem can be partially solved, thanks to the future harvests of "golden" bananas <sup>[15]</sup>. In parallel, the mechanisms of carotenoid production in bananas are also being studied in the USA <sup>[16]</sup>.

Also in the United States, a group of scientists from different countries is working to investigate a compound found in a banana - a protein lectin ( BanLec ). It was found that this protein can become the basis for drugs against viral diseases (influenza, hepatitis C, HIV, etc.). The first experiments showed that it does not allow viruses to enter the cells of the body, but at the same time causes side effects in the form of irritation and inflammation. Slightly "improved" by scientists, BanLec will gradually be tested on animals, and then on humans <sup>[17]</sup>.

In addition, British scientists are working on the creation of medicines that will use fiber from banana and broccoli. This agent is aimed at the treatment of patients with Crohn's disease (inflammatory disease of the gastrointestinal tract) <sup>[18]</sup>.

## **Weight regulation**

Nutritionists recommend a banana for inflammatory diseases of the mucous membranes of the duodenum, stomach and oral cavity. It is included in the diet for diseases of the pancreas, as well as some diseases of the liver and kidneys.

As for diets aimed at reducing weight, in this area the attitude towards the banana is ambiguous. Some believe that this fruit is too high in calories and should never be included in the diet of a losing weight person. Others, on the contrary, argue that a banana, although high in calories, does not contain fat, so it can and should be consumed, but in moderation.

In any case, during the diet, it is preferable to eat unripe bananas, which contain starch that has not yet had time to turn into sugar. The glycemic index of such a fruit is only 30 units, while a ripe banana is about 50. Thus, an unripe fruit will take longer to digest, avoid a sharp spike in sugar and bring longer satiety.

## **In cooking**

In some tropical countries, where the banana is the basis of the diet, it is consumed not only raw or in desserts, but also boiled, deep-fried, baked on coals. Usually, plantains are used to make side dishes. Africans add them to cereals, omelettes, and even soups, and in China, a banana can be found in a vegetable salad. Sauces, casseroles, chips are prepared on the basis of bananas, flour and ketchup are made from them.

By the way, a banana can also come in handy while cooking meat. In order to make it softer and more tender, experienced housewives add banana skin to the pan.

As for the compatibility of a banana with other products, it combines well with sweet fruits and nuts. Some nutritionists do not see anything seditious in mixing a banana with dairy products, while others

consider such a tandem unacceptable. It is best to eat a banana between main meals, separately from other meals.

- **Beverages**

Banana is used to make a wide variety of drinks, from fresh juices, smoothies and cocktails to tea, coffee, beer and gin. More traditional for us, juices and smoothies are recommended to drink every day between meals or after exercise. Victoria's nutritionists and trainers Secret recommend making green juice from a banana, two pears, a stalk of celery, a handful of spinach, lemon, and honey.

Coffee lovers may not be limited to adding banana syrup to the drink, but also experiment with fresh fruit. So, you need to cool 350 ml of strong coffee, add 100 g of ice cream, 1 banana, a pinch of cinnamon, a little grated chocolate and beat everything in a blender. Then put crushed ice in a glass and pour the drink.

Banana is also used in alcoholic beverages. For example, in Uganda, it is used to make the national drink **waragi** (homemade gin). Waragi is usually drunk from barrels through special long straws.

Banana can also be used to make a sweet wine-based cocktail. To do this, take 1 banana, 2 limes, 100 g of chocolate ice cream, 1 tablespoon of powdered sugar in a glass of white nutmeg wine and add ice after mixing.

### **In cosmetology**

Numerous studies show that the banana is useful not only for the health of internal organs and systems, but is also effective when used externally. This fruit is actively used in the development of cosmetic products for facial skin and hair care. Global cosmetic giants annually buy tons of bananas for the manufacture of various creams, lotion masks, etc.

Banana is believed to help moisturize the skin of the face, help eliminate wrinkles and contribute to the fight against acne. The moisturizing mask recipe is simple: mix half a ripe mashed banana with 1 tablespoon of yogurt and 1 tablespoon of vitamin E oil. Apply to a clean face and wash off after 30 minutes. In order to make the skin more elastic and elastic, mix the pulp cut from a banana skin and 1 one yolk. This mask is kept for 5 minutes and then washed off. To treat acne, simply rub the affected area with the inside of the peel and rinse with water after a few minutes.

In hair care, banana has a nourishing, moisturizing and strengthening effect. To achieve the effect and avoid difficulties, it is necessary to adhere to the following recommendations:

- do not knead the banana with a fork, but beat with a blender until a homogeneous mass is obtained, otherwise the lumps will not be washed out well;
- before washing off the mask with water, you should apply shampoo to the hair and lather, otherwise the hair may remain sticky;
- do not keep the mask on your hair for longer than 20-30 minutes (do not let it dry).

As far as recipes go, simply beat a raw egg with 4 tablespoons of mashed banana to make the formula. To achieve a moisturizing effect, you need to mix 3 tablespoons of mashed banana and avocado, a raw egg and 2 tablespoons of unrefined olive oil. In the fight against hair loss, it is advised to combine 4 tablespoons of banana puree with 1 tablespoon of sea salt, and add a little olive oil to get a more liquid consistency. Such a mask is rubbed into the roots, not applied to the entire length of the hair.

### **Unconventional use**

The banana fruit itself is usually used quite traditionally, although sometimes the skin of a banana is used instead of a cream for leather shoes or as a cosmetic product, but banana leaves find a much wider range of applications.

Firstly, they are used as decoration during various Buddhist ceremonies and rituals. In addition, in India they serve as plates for traditional dishes. Secondly, original umbrellas are made from banana leaves, as well as a kind of wrapping paper for products. Thirdly, even a special kind of plant is grown - a textile banana. Its strong false trunk of leaves is used to make fishing nets, sea ropes and rafts. Finally, in some regions of India, a banana leaf is still used instead of toilet paper.

### **Dangerous properties of a banana and contraindications**

Like any other food product, with a general positive effect on the body, in some situations, a banana can produce the opposite effect. This does not mean that it should be completely excluded from the diet, but under certain conditions, the consumption of this fruit should be limited.

- Banana actively removes fluid from the body, as a result of which blood thickens and its flow to organs and parts of the body decreases. Therefore, people suffering from varicose veins, men with erection problems, and patients with thrombophlebitis should not get carried away eating bananas.
- Taking beta-blockers for heart disease significantly increases the level of potassium in the body, so you should not consume a large amount of bananas rich in this mineral, especially with unhealthy kidneys.
- In large quantities, bananas are not recommended for irritable bowel syndrome, as they can cause bloating.
- Uncontrolled consumption of bananas is contraindicated in obese people.
- People with diabetes need to carefully approach the choice of bananas. Slightly unripe fruits are best, because when they ripen, the complex carbohydrates (starch and fiber) contained in them are transformed into carbohydrates with a high glycemic index.

### **Botanical description**

Banana is the fruit of a large perennial herbaceous plant of the banana genus ( lat. *musa* ) of the banana family (lat. *musaceae* ). Although in everyday life and in cooking we are accustomed to consider bananas as just fruits, botanists classify them as berries. It is these non-standard berries that are included in the world's top most important agricultural crops along with wheat, rice, corn and potatoes. According to statistics, people around the world eat about one hundred billion bananas a year <sup>[1]</sup>.

### **origin of name**

As for the scientific term *Musa* , there are two versions of its origin. According to the first, it was borrowed from Arabic, in which the word *mauz* ( arab. موز ) means banana. According to the second version, the Latin name was given in honor of the Greek Renaissance botanist *Antonio Musa* . As for the word "banana" itself, it sounds the same in most modern European languages. It is likely that the Portuguese or Spaniards originally adopted it from the West African language Wolof , in which it is pronounced like this - **banana** <sup>[2]</sup>.

### **Story**

Numerous researchers of the origin of the banana agree that the Malay Archipelago and Oceania were the birthplace of this fruit. Scientists believe that people began to grow bananas there for human

consumption in the 5th millennium BC. And some even claim that the banana was cultivated in Papua New Guinea (Oceania) as early as the 8th millennium BC. <sup>[3]</sup>

Until now, disputes have not subsided about the period of the appearance of bananas in Africa. So, some researchers are convinced that bananas have been grown in Madagascar for about 3 thousand years. However, more substantial evidence suggests that these fruits appeared on the African island only in 400-600 AD, thanks to Asian colonizers. Around the same time, bananas spread throughout the Middle East, and they appeared in China a little earlier - around 200 AD, although they managed to gain wide popularity only in the 20th century <sup>[4]</sup>.

Thanks to the Portuguese sailors who discovered yellow sweet fruits in Africa, banana plantations appeared in the Canary Islands, and from there the road to the Caribbean, Central and South America was opened for these fruits. As for the North American continent, yellow fruits got into the diet of local residents there only in the second half of the 19th century.

The same fate befell the banana in Europe. Until the beginning of the Victorian era, bananas were not in special demand, although they were already known in the Old World (according to legend, their great taste struck Alexander the Great, who brought them from India). A new wave of interest in bananas rose in the 19th century in Hamburg, Germany, where this overseas fruit was brought by sailors, and swept across Europe. The French especially liked the new delicacy. Moreover, in Paris, the banana has become an integral symbol of salon life.

As for Russia, the active import of bananas began under Nikita Khrushchev. Naturally, there is no need to talk about the widespread availability of these fruits, but in big cities they appeared on the shelves from time to time. However, in the 60s. relations between the USSR and one of the two main suppliers of tropical fruit, China, deteriorated. And another supplier country, Vietnam, was engulfed in war, so the import of bananas practically ceased. In the 70s. Leonid Brezhnev arranged the import of fruit from Africa and Latin America.

Interestingly, unlike our time, when a yellow sweet banana can be purchased almost anywhere in the world, earlier it was not possible to enjoy the sweet variety of this tropical fruit everywhere. Not in all countries where bananas were grown, they were suitable for eating raw. And yes, the taste could be different.

However, in the 19th century, a fortunate combination of circumstances contributed to the spread of sweet banana fruits around the world. At the beginning of the century, the French botanist and chemist Jean-Francois Pouyat brought a banana variety from the island of Martinique to Jamaica, which was later called Gros Michel <sup>[5]</sup>. This sweet tropical fruit quickly gained popularity among the locals, and with the imminent appearance of the first cooling chambers, Jamaica established the first large shipments of bananas to other countries. Thus, Gros Michel gradually gained worldwide fame.

## Varieties

The species and varietal diversity of bananas is amazing. In addition to plants that produce edible fruits, there are also ornamental and wild bananas. Directly edible banana varieties are conditionally divided into **dessert** (with sweet pulp) and **plantains** (with a hard, starchy core). The former are usually consumed raw or dried, while the latter require heat treatment or are used as livestock feed.

Interestingly, almost all varieties of edible bananas grown today are varieties of one cultigen - a cultivated plant that has no analogue in the wild. Sometimes wild bananas have a visual resemblance to the familiar yellow crescents, but inside they are speckled with seeds, and a tiny amount of pulp has an unpleasant taste.

As for the bananas eaten, almost all existing varieties are variations of a human-bred hybrid. The work of breeders made it possible to achieve good taste characteristics and the required level of resistance to diseases and pests. Considering that the plant reproduces vegetatively, then, in fact, all bananas growing today have the same progenitor.

However, even such painstaking work is not a guarantee of safety for fruits. For example, the already mentioned variety Gros Michel, the undisputed leader in world supplies, was almost completely destroyed in the middle of the 20th century by a disease called "*Panamanian fungus*". After that, scientists developed a new variety - **Cavendish**, which can now be found on store shelves anywhere in the world.

Among the unusual bananas, in addition to the already described wild one, **red cavendish also stands out**, which, in addition to the skin of the corresponding color, has a creamy taste with raspberry notes. On the island of Java, you can find a blue banana, and in Florida and Hawaii, **Ae bananas grow**. **Ae**, which in appearance (alternating dark green and light green stripes) are more like zucchini<sup>[6]</sup>. In addition, in many countries of the world, including ours, the so-called "**baby banana**". As the name implies, these are small bananas (up to 12 cm), with a thin skin and creamy flesh. As a rule, they are sweeter than ordinary fruits.

### Growing features

Contrary to popular belief, a banana fruit does not grow on a palm tree, but on a herbaceous plant of the same name, which, by the way, along with bamboo, is considered the tallest grass in the world. Leaves overlapping each other in a spiral, from which a false trunk is formed, sometimes reach 12 meters in height. The color of the leaves varies depending on the type and variety of banana (fully green, two-tone - purple-green or spotted - with brown patches). Developing, the banana sheds old leaves, and new shoots appear inside the false trunk.

The flowering period of a banana occurs 8-10 months after planting. A peduncle grows out of the ground through the trunk, forming a complex inflorescence of three tiers of flowers: on top are female flowers that form fruits, below are bisexual, and even lower are male. Pollination occurs due to bats, birds and small mammals. From one inflorescence, several hundred bananas usually develop. The color, shape and taste characteristics of the fruit depend on the cultivar.

The natural habitat of bananas is the territories located in the tropical and subtropical zones. Plants need high humidity, and the optimum temperature ranges from 25 to 36°C. In addition, bananas grow best in acidic soil rich in nitrogen, potassium and phosphorus.

On the territory of Russia, bananas are cultivated only in the vicinity of Sochi, but low winter temperatures do not allow the fruits to fully ripen. As a rule, at a temperature of about 16°C, the growth of a tropical fruit slows down, and at a temperature of 10°C, it stops. A long stay in adverse conditions can lead to the death of the plant.

Despite the unsuitable Russian climate, it is quite possible to grow a banana with edible fruits right in your house or even in an apartment, if you follow some conditions:

1. you need to choose seedlings of dwarf varieties (for example, Musa Super Cavendish Dwarf or Musa Cavendish Dwarf), which reach a height of no more than 1.5-2 meters;
2. the best location for a tropical plant is the brightest place;
3. a banana needs abundant watering and high humidity, if it is not fully provided in the apartment, then the leaves must be regularly sprayed.

In addition, it is recommended to feed the banana every 2 weeks, as well as replant it on time. A sign that the plant is ripe for a larger container is usually rootlets that are visible from the drainage holes. As a rule, a banana begins to bear fruit when it has reached a size suitable for pots with a volume of 30-50 liters.

### **Selection and storage**

Bananas are usually harvested unripe and then transported around the world in cold stores. However, the beauty of this fruit is that it ripens even when it is already plucked from the branch. When choosing bananas, you should start from your goal. If you plan to eat or use the fruit in the next 1-2 days, then you can take bananas with brown dots on the peel. These fruits are already ripe and ready to eat. However, brown or black spots indicate overripeness and the beginning of the rotting process of the fruit.

Naturally, you should check that the banana peel is elastic, without visible damage. Too soft core or light brown spots on it - a sign of overripeness. If you need bananas for the future, then you can take fruits with a greenish peel. You can also use them in this form, but they have a more viscous and less sweet taste, so it is better to let them ripen.

When it comes to storing bananas, 7-10°C is suitable for ripe fruits, and 12-14°C for ripe fruits. Bananas are not advised to be kept in the refrigerator, because at low temperatures the peel quickly turns black (although this does not have much effect on taste). By the way, the advice common on the Internet - to wrap the tails of a banana in cling film for its longer storage - in practice is not very effective.

### **Diseases and pests**

The result of long and painstaking work of breeders was the development of the Cavendish variety, which has excellent taste characteristics, brings good yields and tolerates transportation well. However, for all its merits, there are certain disadvantages that become key when it comes to the viability of the variety. First of all, this is the inability of the plant to develop defense mechanisms against diseases.

The fact is that edible banana fruits can only be obtained from plants that have been propagated vegetatively (planting a shoot). But in this case, the banana ceases to evolve and adapt to the environment, and on the one hand, we always get the same high-quality and tasty crop, and on the other, susceptibility to disease.

Gros Michel variety, bred by breeders, fell into the same trap. In the middle of the twentieth century, it was attacked by the so-called "Panama disease" TR1 (Tropical fungus Race 1), which led to the cessation of large-scale cultivation of Gros Michel. Working on breeding the Cavendish variety, the researchers took into account the characteristics of the disease and made the "new" fruit resistant to it. However, the organisms affecting the fruits continued to develop. As a result, the mutated type of "Panama disease" TR4 threatened the further fate of Cavendish.

However, the complete disappearance of the banana is not yet threatened. Scientists continue to conduct research and try to introduce into a new variety one of the genes of the Indonesian wild banana, which copes well with the TR diseases that exist today. However, this process is slightly slowed down by the fact that seeds are needed for selective selection, and they are extremely rare in edible bananas.

In addition to the "Panamanian disease", the banana is subject to attacks by roundworms and black weevils. Also, problems can arise due to bacterial moko disease or sigatoka fungus, but banana growers have learned to cope with these misfortunes, thanks to chemicals.

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[An extended HTML version of the article](#) is available on the website edaplus.info.

## Banana - useful properties, composition and contraindications

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*Received 13.09.18*

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



## Viburnum

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

**Keywords:** viburnum, useful properties, potentially dangerous effects, side effects, contraindications, diets

## Beneficial features

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

| Main substances (g / 100 g): | Dried fruits of viburnum <sup>[6]</sup> |
|------------------------------|-----------------------------------------|
| Carbohydrates                | 28 g                                    |
| calories                     | 105 kcal                                |
| Vitamin C                    | 82 mg                                   |
| Vitamin A                    | 2.5 mg                                  |
| Vitamin E                    | 2 mg                                    |

## What is used and in what form

In recipes of folk and official medicine, viburnum bark, flowers and fruits are used. Flowers and bark are used in infusions and decoctions, both for internal and external use. Fruits are most often consumed fresh, in a grated state, with the addition of honey or sugar. Viburnum fruit juice is boiled with sugar, syrups and jelly are prepared. Fresh viburnum juice is used externally for the treatment of skin diseases . Kalina is a part of vitamin teas.

## Medicinal properties of viburnum

The bark of common viburnum contains the bitter glycoside viburnin and an enzyme that provokes its decomposition, cyclic alcohol viburnitol, tannins and resinous substances, coumarin derivatives (scopoletin, esculetin), organic acids (valeric, formic, capric, linoleic, palmitic).

The fruits of viburnum vulgaris contain cyclic alcohol viburnitol, invert sugar, viburnin bitterness, ascorbic, acetic and isovaleric acids, pectins. <sup>[5]</sup>

Flavonoids comperol-3-glycoside and kaempferol-3,7-diglucoside were found in viburnum flowers. Viburnum roots contain sterols, astragalin, peonozide, essential oil, amyirin derivatives. Viburnum seeds contain up to 21% fatty oils. <sup>[6]</sup>

Herbal preparations of viburnum bark have hemostatic and weak diuretic properties, have an astringent and calming effect, increase the tone of the muscles of the uterus, and increase the duration of the action of sleeping pills. As a hemostatic agent, drugs based on the bark of viburnum are used for uterine bleeding (and menopausal bleeding), for algomenorrhea, subinvolution of the uterus in the postpartum period, for bleeding against the background of inflammatory diseases of the female reproductive system, and also for hemorrhoidal bleeding. Viburnum bark is used in the prevention of miscarriages. Viburnum fruits (mashed with honey or sugar, in the form of syrup) are prescribed for nervous excitement, high blood pressure, atherosclerosis and vasospasm.

The fruits of viburnum boiled with honey are used for coughing, hoarseness, shortness of breath, liver diseases, jaundice and diarrhea. Viburnum juice with honey is used in folk medicine in the treatment of breast cancer, for the prevention of gastric cancer in gastritis with low acidity. It is believed that the systematic use of viburnum fruits favorably affects the condition of patients suffering from malignant tumors of the digestive system. An infusion of viburnum fruits is drunk for boils, carbuncles, eczema, skin rashes of various etymologies, as a vitamin, tonic and mild laxative. In dermatology and cosmetology, fresh juice of viburnum fruits helps with acne and age spots. Infusion of flowers is used in folk medicine for coughs, colds, sclerosis, pulmonary tuberculosis and stomach diseases. Gargle with a flower infusion and wash the wounds. <sup>[7]</sup>

## In traditional medicine

An extract of viburnum fruit on a water-alcohol basis can be found in pharmacies: this drug is called "Kalifen". It belongs to dietary supplements and is consumed with food as a source of substances - proanthocyanidins. The product is available in liquid form, in vials.

In pharmacies, you can buy crushed viburnum bark in packages.

In the pharmaceutical perspective, there is also the production of gelatin capsules with viburnum oil. <sup>[one]</sup>

## In folk medicine

- With painful menstruation, menopausal uterine bleeding, and also to prevent miscarriage, they drink it as a decoction: pour a tablespoon of crushed viburnum bark into 200 ml of water, boil for 10 minutes, then cool. Take up to three times a day for a teaspoon.
- As a mild expectorant, sedative and hypotensive agent, a decoction of viburnum fruits is used: pour half a tablespoon of viburnum berries into 200 ml of water, boil, cool. Drink a tablespoon three times a day. <sup>[5]</sup>

- With a cold cough, fever, take a teaspoon of viburnum flowers for 200 ml of boiling water, let it brew for 10 minutes. Take up to 2 glasses per day.
- For stomach ulcers, colitis, constipation, three times a day, 30 minutes before meals, take a tablespoon of crushed raw berries.
- For colds, bouts of dry debilitating cough, intestinal upset and hoarseness, hoarse voice, they drink a decoction of viburnum berries with honey in a warm form (up to 150 ml per day).
- With hypertension, several viburnum berries, pounded with sugar and begun to "ferment", are taken raw: up to 10 berries per day.
- For boils, carbuncles, eczema, various skin rashes, take an aqueous decoction of viburnum berries.
- With dyspepsia and as a diaphoretic, a decoction of viburnum seeds is used. <sup>[eight]</sup>
- In case of influenza, fresh or frozen viburnum fruits are rubbed with honey (in proportions of 1: 1), add a small amount of boiled water at room temperature, take half a tablespoon three times a day after meals.
- When coughing, mix the washed fruits of viburnum with honey (1: 2), let it brew for at least 6 hours, and take a tablespoon three times a day.
- In case of bronchial asthma, pour a tablespoon of ripe fruits of viburnum mashed in mashed potatoes with 200 ml of warm boiled water, combine with a tablespoon of honey. Bring to a boil over low heat, then keep on low heat for at least a quarter of an hour, strain, cool and take a tablespoon 3-5 times a day.
- For hypertension, viburnum bark is also used: pour 2 tablespoons of crushed bark into 400 ml of boiling water. Bring to a boil, keep in a water bath for half an hour, strain, cool and drink a tablespoon three times a day.
- In case of coronary heart disease, eat viburnum fruits grated with sugar - up to 3 tablespoons per day, or drink viburnum juice in small portions (100 ml of juice per day).
- In case of tachycardia, grind 5 tablespoons of viburnum fruits in an enamel bowl, gradually pour in 600 ml of boiling water, stirring constantly, let it brew for 4 hours, then strain. Drink 100 ml per day, in 4 doses, before each meal.
- With hemorrhoidal bleeding, a decoction prepared from a tablespoon of crushed viburnum bark and 200 ml of boiling water is drunk in a tablespoon three times a day, or ready-made pharmacy candles are used on viburnum bark extract. <sup>[3]</sup>
- When coughing, a home remedy is useful, for the preparation of which you will need 400 g of viburnum fruits, 400 g of honey, 220 g of sugar and 250 ml of wine vinegar. Washed and dried fruits grind in a puree and bring to a boil. Strain and add honey, sugar and wine vinegar to the strained broth. Stir, boil the mixture and pour into sterilized bottles. Keep refrigerated. <sup>[four]</sup>

Externally:

With angina, an infusion of fruits, flowers and leaves is gargled. Pour a tablespoon of flowers or leaves with 200 ml of boiling water, leave for an hour, then strain. Gargle several times a day.

Juice of viburnum berries remove acne on the face. For acne, mix the juice of fresh viburnum fruits with honey (in equal parts), apply to cleansed face skin, rinse with warm water after a quarter of an hour. <sup>[3]</sup>

Ripe crushed berries or pulp from cambium bark scraped off from young branches are used for compresses on wounds (including bleeding ones) and on skin areas affected by eczema. <sup>[eight]</sup>

### **in oriental medicine**

In Chinese informal medicine, viburnum fruits and leaves were considered a laxative and emetic.

## In scientific research

The medicinal potential of viburnum is a fertile material for research.

- The scientific substantiation of the traditional use of Turkish folk medicine viburnum in the treatment of nephrolithiasis is confirmed in the article by M. Ilhan, B. Ergen , I. Suntar and others <sup>[9]</sup>
- An assessment of the agro-morphological , biochemical and bioactive characteristics of viburnum is given in a study by Turkish scientists N. Ersoy , S. Ersisli and M. Gundogdu . <sup>[ 10]</sup>
- The stress-protective properties of viburnum and the role of the plant in stimulating the metabolic reactions of liver fat metabolism were studied in the work of Sprygin V.G., Kushnerova N.F., Fomenko S.E. and others <sup>[11]</sup>
- Dissertation of Ilyasova S.M. is devoted to a comparative analysis of the properties of phytopreparations based on common viburnum and viburnum pride . <sup>[ 12]</sup>
- The antioxidant properties of viburnum are the subject of the work of Tsekhina N.N., Khasyanova N.G., Orekhova S.V. <sup>[13]</sup>

## Weight regulation

Viburnum fruits are used for fasting days (consumed with water, honey or a small amount of sugar). They also use viburnum as part of diets ( watermelon- viburnum diet, fasting days on watermelons and viburnum fruits).

## In cooking

- Viburnum jam

Ethnobotanist Robin Harford 's recipe

You will need products: 800 g of viburnum berries (the fruits should be soft, easily squeezed by your fingers), orange puree (you will need the pulp of 2 oranges), 12 small apples mashed to a puree state (it is better to use "paradise apples"), 0.5 l of cold water, sugar.

Mix viburnum fruits, orange and apple puree and water in a saucepan with a thick bottom, and bring to a boil. Boil over low heat, stirring occasionally. Put the boiled mass in a clean tissue bag, placing it in a suspended state over the container and leave it overnight for decanting. Measure the expressed jelly base liquid with a measuring cup and add sugar (at the rate of 0.5 kg of sugar for every 0.5 l of liquid). Stirring evenly, bring to a boil over low heat, and boil for about a quarter of an hour. As soon as the jam begins to thicken, remove from heat, let it brew for 5 minutes, pour into sterilized jars and close. <sup>[fourteen]</sup>

- Spicy viburnum sauce (for meat or fish)

Required ingredients: 1 kg of viburnum fruits, 1 kg of granulated sugar, 5 g of citric acid and red hot pepper (one pod). Rinse the viburnum under running water, let it drain, then simmer in a small amount of water for a couple of minutes and rub through a sieve. Combine the mashed puree with granulated sugar, citric acid and finely chopped, seeded pepper. While stirring, bring the sauce to a homogeneous state. Arrange in sterilized jars and let it brew at room temperature for 48 hours. For long-term storage, close the jars as usual. Store the sauce in a dark and cool place. To eat immediately, store the sauce in the refrigerator, tightly closed. <sup>[fifteen]</sup>

- Belish with viburnum

To prepare such a traditional Tatar pie with viburnum berries for the dough, you will need: 4 cups of flour, 2 cups of curdled milk, 3 eggs, 200 g of butter, 0.75 teaspoon of baking soda, a pinch of salt. Ingredients for the filling: 0.5 kg of viburnum berries, 0.3 kg of sugar, 150 g of malt, 2 tablespoons of ground crackers. Also one egg for greasing the surface of the pie. Knead the dough from flour, curdled milk, beaten eggs, melted butter, soda and salt. Sort viburnum, mix with sugar and malt, and leave to infuse in a closed, well-heated oven. Divide the dough into two unequal parts. Roll out the cake from a larger portion of the dough, put it in a greased form in such a way that the edges of the dough hang from the sides of the form. Put the viburnum filling on the cake, wrap the edges of the dough a little towards the center, forming folds. Roll out pigtails and flagella from a smaller portion of the dough, decorate the pie with them. Put the pie in the form in a warm place to "fit". Then grease with egg mass and bake at medium temperature until golden brown. <sup>[16]</sup>

### **Combination with other products**

In combination with apples, marmalade is prepared from viburnum fruits (viburnum and apples are taken in equal proportions), as well as marshmallow (viburnum fruits should be taken one third). Viburnum and mountain ash complement each other especially well in taste: viburnum fruits soften the bitterness of mountain ash, and rowan berries, in turn, give the dish or product a pleasant color and a peculiar taste and aroma. <sup>[2]</sup>

### **Viburnum drinks**

- Kissel from viburnum

It will take 150 g of juice from viburnum fruits, 300 g of sugar, 120 g of potato starch and 2 liters of water. Dilute the juice with water, heat to a hot state, add starch, previously diluted in a small amount of cold boiled water, then add sugar, mix everything thoroughly and bring to a boil. So that the surface of the finished jelly is not covered with a tightening film, sprinkle with a small amount of sugar.

- Morse from viburnum

Ingredients: a glass of ripe viburnum fruits, half a glass of granulated sugar, 1 liter of water. Sort the fruits (berries), wash, mash and squeeze the juice. Place the container with juice in the refrigerator. Pour viburnum pomace with hot water, bring to a boil, boil for 10 minutes, then strain, add sugar, cool and combine with the previously squeezed juice. Pour into glasses and serve with a slice of lime or orange.

- Drink from oats and viburnum:

You will need a glass of oats, half a glass of viburnum fruits, 0.25 cups of raisins or dried apricots, 3 teaspoons of honey or sugar, 1.5 liters of water.

Sort the oats, rinse, pour cold water, boil and let it brew for at least 3 hours. Then bring to a boil again, add the mashed fruits of viburnum, add chopped raisins or dried apricots, remove from heat and leave for an hour. Strain, serve warm or cold with honey or sugar. <sup>[four]</sup>

### **Kalina in cosmetology**

Fruits, flowers and leaves of viburnum are used in many cosmetic recipes: in the treatment of problem skin, to get rid of age spots and freckles.

- **Toning face mask from viburnum leaves** : chop the washed viburnum leaves, apply a thin even layer on the face skin smeared with a greasy cream. After a quarter of an hour, remove the mask with a soft cloth and rinse with warm water.
- **Cosmetic viburnum ice** (frozen juice of viburnum fruit) is used for facial massage, lightening age spots, removing freckles and eliminating fine wrinkles.
- **Viburnum juice whitening mask** : mix viburnum fruit juice and egg white in equal proportions. Apply to previously cleansed face. Wash off after 20-30 minutes with warm water. Also, to whiten the skin, you can combine viburnum juice with honey.
- **To remove freckles and lighten overly tanned skin**, use this homemade cosmetic product: mix viburnum juice with sour cream (1: 1), apply the mixture on your face. Leave the mask for 15 minutes, remove the residue with a soft cloth and rinse with warm water.
- **tonic lotion** is prepared as follows: steam a handful of viburnum flowers with 200 ml of boiling water. Let it brew for 2 hours, then strain. Ready infusion to use for rubbing the skin of the face.
- **Fresh viburnum juice** is used to wipe oily skin, to eliminate acne and age spots. After applications with viburnum fruit juice, the skin must be softened with a nourishing cream. <sup>[17]</sup>

### Dangerous properties of viburnum and contraindications

Uncontrolled consumption of fresh viburnum fruits can cause vomiting (also if the berries have retained bitterness that has not been eliminated by the first frosts). Viburnum is contraindicated for gout. With caution, it should be taken by those who suffer from low blood pressure (hypotension). <sup>[3,6]</sup>

### Species and varieties

There are at least 166 species belonging to the genus Kalina. The most common ones are:

1. **Viburnum vulgaris** - the habitat of the species covers eastern Europe and western Siberia. Medicinal plant. Within the framework of this species, many decorative (" Compactum ", " Roseum ", "Buldenezh") and fruit varieties ("Pomegranate Bracelet", "Red Coral");
2. **Viburnum whole-leaved ( gordovina )** is a predominantly wild-growing species, growing in the central and southern parts of Europe. It is also cultivated as an ornamental shrub with dense, beautiful inflorescences. Known as "black viburnum". Ink is produced from the berries of this species, chibouks are produced from the stem part;
3. **Viburnum evergreen (laurel)** - an ornamental Mediterranean shrub that has become widespread on the southern coast of the Crimean peninsula;
4. **Kalina Bureinsky** - found on the territory of the Bureinsky mountain range (Khabarovsk Territory). The plant is a honey plant. The view has a decorative value;
5. **Kalina Raita** - grows on Sakhalin, the Kuril Islands, Korea and Japan. The species is listed in the Red Books of Russia and the Sakhalin Region;
6. **6 Fragrant viburnum** - common in Japan, Korea, India. <sup>[one]</sup>

**Viburnum vulgaris** is a branched bush from 2 to 5 m high with gray bark. The leaf arrangement is opposite, the leaves are large, petiolate. Snow-white flowers are collected in corymbose inflorescences. Shiny, juicy, bright red fruits form drooping clusters. The fruits are berry -like oval drupes with a hard stone. Blooms in May-June.

Viburnum grows along water bodies, in meadows, in the undergrowth of mixed and deciduous forests. <sup>[2]</sup>

### Growing features

The plant propagates both by seed and vegetatively (by dividing the bush, cuttings, layering, etc.). Seeds are subjected to long-term stratification and then planted in prepared soil, keeping the distance between rows from 0.3 to 0.4 m. After two years of cultivation, the seedlings are transplanted to a permanent plot. The plant tolerates wintering well without shelter. Viburnum grows on any type of soil, with the exception of overly dense clay or rocky soil. Light-loving and moisture-loving plant: needs additional watering during the flowering period, and during active growth in the spring. The most effective way to propagate viburnum is in a greenhouse, using green cuttings, in early summer. In this case, by autumn, a well-developed root system is formed in a young tree. [3]

### **How to choose**

The degree of maturity of viburnum fruits can be judged by the color of the berries: they should be saturated, dark red, pomegranate in color. It is also important to remember that the harvest from the viburnum tree can only be harvested after the fruits have been "grabbed" by the first frosts and bitterness has gone out of them. [6]

### **When to harvest viburnum?**

The bark is harvested in the spring, during the movement of juices (April-May). On cut branches, circular cuts are made with knives at an interval of 0.25 m, they are connected by longitudinal cuts, after which the bark is easily removed. Dry in attics, under a canopy, where there is good ventilation, laying out a thin layer of 3-5 cm, on paper or cloth. Shelf life up to 4 years. Stored in bales up to 50 kg.

The fruits are harvested when they are fully ripe (August-September). Whole bunches are cut with knives or sickles and put loosely in baskets. Dry in ovens or dryers. After threshing and separating on a sieve from twigs and stalks. Dried fruits are stored in bags. Shelf life has not been set.

### **How to store**

Viburnum fruits can be stored dried or dried, ground with sugar, frozen and stored in the freezer like ordinary berries, as well as squeezed juice and prepared or boiled syrup.

### **How to dry viburnum?**

To prepare dried viburnum, you need to: rinse ripe fruits, remove stalks, sort out spoiled berries. To reduce bitterness, the fruits should be blanched for 2-3 minutes. Then let drain, dry on a paper towel, getting rid of excess moisture, and mix with sugar. For 1 kg of viburnum fruits, take 250 g of granulated sugar and let it brew for a day at room temperature. Drain the resulting juice, add 250 g of sugar to the viburnum mass again and hold until the juice appears. The juice drained for the first and second time is combined and preserved. The remaining viburnum -sugar mass is poured with hot syrup of 50% concentration and allowed to brew for 5 minutes. Then the syrup is separated, filtered through a sieve, and the fruits are laid out in a thin layer on a baking sheet, put in the oven, and kept for half an hour at a temperature of 850 C. Then they are laid out in jars.

### **How to properly dry viburnum?**

To dry the fruits of viburnum, they are thoroughly washed in their ripe form along with the stalks, which are then very carefully removed. The washed fruits are laid out in an even thin layer on a baking sheet covered with parchment and dried at a temperature of 50-600 C with the door open. Slow drying is possible as the fruits are not susceptible to mold due to their high content of antimicrobial substances. Properly dried viburnum fruits are roundish, wrinkled and flattened. Dried viburnum has a barely perceptible aroma and a bitter-sour taste. It is mainly used for making decoctions.

## How to preserve viburnum juice?

You will need: 1 kg of viburnum fruits, 200 g of granulated sugar and 200 ml of water. Sort the fruits, wash and squeeze the juice out of them. Pour the pulp with water, boil for 5 minutes, then strain. The broth is combined with squeezed juice, sugar is added, mixed, poured into jars, pasteurized and closed.

## Kalina with honey: how to cook for long-term storage?

It will take 400 g of viburnum and 200 g of honey. Pick the fruits of viburnum, rinse well, dry. Rub the prepared fruits through a sieve. Add honey and mix thoroughly. Pour into sterilized jars and store in the refrigerator. <sup>[four]</sup>

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## Viburnum - useful properties, composition and contraindications

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Received 09/16/18

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



### **Vitamin D - description, benefits and where it is contained**

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

**Keywords:** vitamin D, vitamin D , benefits, harms, beneficial properties, contraindications, sources

### **A Brief History of Vitamin Discovery**

Diseases associated with vitamin D deficiency were known to mankind long before its official discovery.

- Mid 17th century - Whistler and Glisson pioneered independent research into the symptoms of the disease later called **rickets** . However, in scientific treatises nothing was said about the measures to prevent the disease - enough sunlight or good nutrition.
- 1824 Dr. Schötte first prescribed fish oil as a treatment for rickets.
- 1840 - Polish doctor Sniadecki released a report that children living in regions with low solar activity (in the polluted center of Warsaw) have a greater risk of getting rickets than children living in villages. Such a statement was not taken seriously by his colleagues, since it was believed that the sun's rays could not affect the human skeleton.
- Late 19th century - more than 90% of children living in polluted European cities suffered from rickets.
- 1905-1906 - it was discovered that with a lack of certain substances from food, people fall ill with a particular disease. Frederick Hopkins suggested that in order to prevent diseases such as scurvy and rickets, some special components must be supplied with food.

- 1918 - it was discovered that beagles who consume fish oil do not develop rickets.
- 1921 - Scientist Palm 's suggestion of lack of sunlight as the cause of rickets was confirmed by Elmer McCollum and Marguerite Davis . They demonstrated that giving lab rats fish oil and exposing them to sunlight accelerated the growth of the rats' bones.
- 1922 - McCollum isolated a "fat-soluble substance" that prevents rickets. Since vitamins A, B, and C of a similar nature had been discovered shortly before, it seemed logical to name the new vitamin in alphabetical order - D.
- 1920s - Harry Steenbock patents a method of exposing foods to UV rays to enrich them with vitamin D.
- 1920-1930 Various forms of vitamin D were discovered in Germany.
- 1936 - It was proved that vitamin D is produced by the skin under the influence of sunlight, as well as the presence of vitamin D in fish oil and its effect on the treatment of rickets.
- Beginning in the 1930s, some foods in the US began to be fortified with vitamin D. In the post-war period, there were frequent poisonings in Britain from an excess of vitamin D in dairy products. Since the early 1990s, numerous studies have appeared on the decline in vitamin levels in the world's population.

#### **Foods with the highest content of vitamin D [4-6]:**

|                        | Content (D2 + D3) (µg/100g) | Content (IU/100 g) |
|------------------------|-----------------------------|--------------------|
| Fish fat               | 250                         | 10000              |
| Mackerel               | 16.1                        | 643                |
| Salmon                 | eleven                      | 441                |
| Tuna                   | 5.7                         | 227                |
| Egg yolk               | 5.4                         | 218                |
| C herring              | 4.2                         | 167                |
| Caviar (red, black)    | 2.9                         | 117                |
| beef liver             | 1.2                         | 49                 |
| Mushrooms sh and itaka | 0.4                         | eighteen           |
| ricotta cheese         | 0.2                         | ten                |
| Shrimps                | 0.1                         | 2                  |
| Whole milk             | 0.1                         | 2                  |

See also **Top 100 Natural Sources of [Vitamin D](#)**.

#### **Daily requirement for vitamin D**

In 2016, the European Committee for Food Safety established the following recommended daily intake of vitamin D, regardless of gender:

| Age                | Recommended Amount (mcg/day) (International Units/day) |
|--------------------|--------------------------------------------------------|
| 6-11 months        | 10 mcg (400 IU)                                        |
| 1-3 years          | 15 mcg (600 IU)                                        |
| 4-6 years old      | 15 mcg (600 IU)                                        |
| 7-10 years old     | 15 mcg (600 IU)                                        |
| 11-14 years old    | 15 mcg (600 IU)                                        |
| 15-18 years old    | 15 mcg (600 IU)                                        |
| 18 years and older | 15 mcg (600 IU)                                        |

It is worth noting that many European countries set their own intake of vitamin D, depending on solar activity throughout the year. For example, in Germany, Austria and Switzerland, since 2012, the intake of 20 micrograms of vitamin per day has been considered the norm, since in these countries the amount obtained from food is not enough to maintain the required level of vitamin D in blood plasma - 50 nanomoles / liter. In the US, the recommendations are slightly different, with people over the age of 71 being advised to consume 20 mcg (800 IU) per day.

Many experts believe that the minimum amount of vitamin D intake should be increased to 20-25 mcg (800-1000 IU) per day for adults and the elderly. In some countries, scientific committees and nutrition societies have been able to increase the level of daily allowance to achieve the optimal concentration of the vitamin in the body <sup>[4]</sup>.

### **When does the need for vitamin D increase?**

Even though our body is able to produce vitamin D on its own, the need for it can increase in a few cases. First, **dark skin** reduces the body's ability to absorb ultraviolet B radiation needed to produce the vitamin. In addition, the use of **sunscreen** with an SPF factor of 30 reduces the ability to synthesize vitamin D by 95 percent. In order to stimulate the production of the vitamin, the skin must be fully exposed to the sun's rays.

People living in the northern parts of the Earth, in polluted regions, who work at night and spend the day indoors, or who work from home, should ensure that they receive adequate levels of the vitamin from food. Infants who are exclusively breastfed should receive vitamin D supplements, especially if the infant has dark skin or minimal exposure to sunlight. For example, American doctors advise giving infants 400 IU of vitamin D per day in the form of drops.

### **Physico-chemical properties of vitamin D**

Vitamin D is a group of **fat-soluble substances** that help the body absorb calcium, magnesium, and phosphate through the intestines. In total, there are five forms of vitamin - D<sub>1</sub> (a mixture of ergocalciferol and lumisterol), D<sub>2</sub> (ergocalciferol), D<sub>3</sub> (cholecalciferol), D<sub>4</sub> (dihydroergocalciferol) and D<sub>5</sub> (sitocalciferol). The most common forms are D<sub>2</sub> and D<sub>3</sub>. It is about them that we are talking about when they say "vitamin D" without indicating a specific number. By their nature, they are secosteroids. Vitamin D<sub>3</sub> is produced photochemically, under the influence of ultraviolet rays, from the protosterol 7-dehydrocholesterol, which is present in the epidermis of the skin of humans and most higher animals. Vitamin D<sub>2</sub> is present in some foods, notably portobello and shiitake mushrooms. These vitamins are relatively stable at high temperatures, but are easily destroyed by oxidizing agents and mineral acids.

### **Useful properties and its effect on the body**

According to the European Committee for Food Safety, vitamin D has been confirmed to provide clear health benefits. Among the positive effects of its use are observed:

- normal development of bones and teeth in infants and children;
- maintaining the condition of teeth and bones;
- normal functioning of the immune system and a healthy response of the immune system;
- reducing the risk of falls, which are often the cause of fractures, especially in people over 60 years of age;
- normal absorption and action of calcium and phosphorus in the body, maintaining a normal level of calcium in the blood;
- normal cell division.

In fact, vitamin D is a prohormone and has no biological activity on its own. Only after it undergoes metabolic processes (first turning into 25 (OH) D<sub>3</sub> in the liver, and then into 1α,25 (OH)<sub>2</sub> D<sub>3</sub> and 24R,25 (OH)<sub>2</sub> D<sub>3</sub> in the kidneys), are produced biologically active molecules. In total, about 37 vitamin D<sub>3</sub> metabolites have been isolated and chemically characterized.

The active metabolite of vitamin D ( calcitriol ) performs its biological functions by binding to vitamin D receptors, which are primarily located in the nuclei of certain cells. This interaction allows vitamin D receptors to act as a factor that modulates gene expression for the transport of proteins (such as TRPV6 and calbindin ) that are involved in calcium absorption in the intestine. The vitamin D receptor is a member of the superfamily of nuclear receptors for steroid and thyroid hormones and is found in the cells of most organs - the brain, heart, skin, gonads, prostate and mammary glands. Activation of the vitamin D receptor in the cells of the intestine, bones, kidneys and parathyroid gland leads to the maintenance of the level of calcium and phosphorus in the blood (with the help of parathyroid hormone and calcitonin ), as well as the maintenance of the normal composition of skeletal tissues.

### **The key elements of the vitamin D endocrine pathway are:**

1. photoconversion of 7-dehydrocholesterol to vitamin D<sub>3</sub> or dietary intake of vitamin D<sub>2</sub> ;
2. metabolism of vitamin D<sub>3</sub> in the liver to 25(OH)D<sub>3</sub> - the main form of vitamin D circulating in the blood;
3. the functioning of the kidneys as endocrine glands for the metabolism of 25(OH)D<sub>3</sub> and its conversion into two main dihydroxylated vitamin D metabolites - 1α,25(OH)<sub>2</sub> D<sub>3</sub> and 24R,25(OH)<sub>2</sub> D<sub>3</sub> ;
4. systemic transport of these metabolites to peripheral organs via plasma vitamin D binding protein;
5. the reaction of the above metabolites with receptors located in the nuclei of the cells of the corresponding organs, with subsequent biological responses (genomic and direct).

### **Interaction with other elements**

Our body is a very complex biochemical mechanism. How vitamins and minerals interact with each other is interconnected and depends on many factors. The effect that vitamin D produces in our body directly depends on the amount of other vitamins and minerals, which are called cofactors . There are a number of such cofactors , but the most important ones are:

- Calcium: One of the most important functions of vitamin D is to stabilize calcium levels in the body. That is why maximum absorption of calcium occurs only when there is a sufficient amount of vitamin D in the body.
- Magnesium: Every organ in our body needs magnesium to function properly and to fully transform food into energy. Magnesium helps the body absorb vitamins and minerals such as calcium, phosphorus, sodium, potassium, and vitamin D. Magnesium can be obtained from foods such as spinach, nuts, seeds, and whole grains.
- Vitamin K: Our body needs it to heal wounds (ensure blood clotting) and to keep bones healthy. Vitamin D and K work together to keep bones strong and develop properly. Vitamin K is found in foods such as kale, spinach, liver, eggs, and hard cheese.
- zinc: it helps us fight infections, form new cells, grow and develop, and fully absorb fats, carbohydrates and proteins. Zinc helps vitamin D to be absorbed in the tissues of the skeleton, and also helps transport calcium to the bones. A large amount of zinc is found in meat, as well as some vegetables and grains.
- boron: our body needs little of it, but it plays an important role in the metabolism of many substances, including vitamin D. Boron is found in foods such as peanut butter, wine, avocados, raisins, and some leafy vegetables .

- Vitamin A: Together with vitamin D, retinol and beta-carotene help our "genetic code" work. If the body lacks vitamin A, vitamin D will not be able to function properly. Vitamin A can be obtained from carrots, mangoes, liver, butter, cheese and milk. It must be remembered that vitamin A is fat-soluble, so if it comes from vegetables, it must be combined with various fat-containing foods. In this way, we can get the maximum benefit from food.

### **Healthy Vitamin D Food Combinations**

The most useful is the combination of vitamin D with calcium. The vitamin is needed by our body in order to fully absorb calcium, which is indispensable for our bones. Good product combinations in this case would be, for example :

- grilled salmon and lightly braised kale;
- omelet with broccoli and cheese;
- sandwich on whole grain bread.

It is useful to combine vitamin D with magnesium, for example, by eating sardines with spinach. This combination may even reduce the risk of heart disease and colon cancer.

*Of course, it is better to get the required amount of vitamin directly from food and spending as much time as possible in the fresh air, allowing the skin to produce vitamin D. Taking vitamins in tablets is not always useful, and only a doctor can determine how much of a particular element our body needs. Incorrect intake of vitamins can often harm us and lead to certain diseases.*

### **Application in official medicine**

Vitamin D is essential for regulating the absorption and levels of the minerals calcium and phosphorus in the body. It also plays an important role in maintaining proper bone structure. Walking on a sunny day is an easy and reliable way to get the right vitamin dose for most of us. When exposed to sunlight on the face, arms, shoulders and legs once or twice a week, the skin will produce enough of the vitamin. Exposure time depends on age, skin type, time of year, day. It's amazing how quickly vitamin D can be replenished with sunlight. Just 6 days of intermittent sun exposure can make up for 49 days without sun. Our body's fat stores serve as a storehouse for the vitamin, which is gradually released in the absence of ultraviolet rays.

However, vitamin D deficiency is more common than one might expect. People living in northern latitudes are especially at risk. But it can occur even in sunny climates, as people in southern countries spend a lot of time indoors and use sunscreen to escape excessive solar activity. In addition, deficiency often occurs in older people.

### **Vitamin D as a drug is prescribed in such cases:**

1. with a low content of phosphorus in the blood due to a hereditary disease ( familial hypophosphatemia ). Taking vitamin D along with phosphate supplements is effective for treating bone disorders in people with low blood phosphate levels;
2. with a low content of phosphates in Fanconi syndrome ;
3. with a low content of calcium in the blood due to low levels of parathyroid hormones. In this case, vitamin D is taken orally;
4. taking vitamin D ( cholecalciferol ) is effective in the treatment of osteomalacia (softening of the bones), including those caused by liver disease. In addition, ergocalciferol may help with osteomalacia due to certain medications or poor intestinal absorption ;

5. with psoriasis. In some cases, a very effective treatment for psoriasis is the topical application of vitamin D along with medications containing corticosteroids;
6. with renal osteodystrophy. Vitamin D supplementation prevents bone loss in people with kidney failure;
7. rickets. Vitamin D is used in the prevention and treatment of rickets. People with kidney failure need to use a special form of the vitamin - calcitriol ;
8. while taking corticosteroids. There is evidence that vitamin D in combination with calcium improves bone density in people taking corticosteroids;
9. osteoporosis. Vitamin D<sub>3</sub> is believed to prevent bone loss and weakening of bones in osteoporosis.

Some studies show that getting enough vitamin D can reduce the risk of **certain types of cancer** . For example, it was observed that men taking high doses of the vitamin had a 29% lower risk of colon cancer compared to men with low blood levels of 25(OH)D (study of more than 120,000 men over five years). Another study tentatively concluded that women with sufficient sun exposure and dietary vitamin D supplementation had a lower risk of breast cancer 20 years later.

There is evidence that vitamin D can reduce the risk of **autoimmune diseases** , in which the body produces an immune response against its own tissues. Vitamin D<sub>3</sub> has been found to modulate autoimmune responses mediated by immune cells ("T cells") such that autoimmune responses are reduced. These include diseases such as type 1 diabetes, multiple sclerosis and rheumatoid arthritis.

The results of epidemiological and clinical studies suggest an association between higher blood levels of 25(OH)D and lower blood pressure, leading to the conclusion that 25(OH)D reduces the synthesis of the enzyme "renin", which plays a key role in the *regulation of blood pressure* .

Low vitamin D levels can increase the chance of getting TB. Preliminary evidence suggests that vitamin D may be a useful adjunct to conventional treatment for this infection.

### **Dosage forms of vitamin D**

Vitamin D in dosage form can be found in different forms - *in the form of drops, alcohol and oil solutions, injections, capsules* , both alone and in combination with other useful substances. For example, there are such multivitamins as:

- cholecalciferol and calcium carbonate (the most popular combination of calcium and vitamin D);
- alfalcidol and calcium carbonate (the active form of vitamin D<sub>3</sub> and calcium);
- calcium carbonate, calciferol, magnesium oxide, zinc oxide, copper oxide, manganese sulfate and sodium borate;
- calcium carbonate, cholecalciferol , magnesium hydroxide, zinc sulfate heptahydrate ;
- calcium, vitamin C, cholecalciferol ;
- and other additives.

In supplements and fortified foods, vitamin D is available in two forms: D<sub>2</sub> ( *ergocalciferol* ) and D<sub>3</sub> ( *cholecalciferol* ). Chemically, they differ only in the structure of the side chain of the molecule. Vitamin D<sub>2</sub> is produced by ultraviolet irradiation of ergosterol from yeast, and vitamin D<sub>3</sub> by irradiation of 7-dehydrocholesterol from lanolin and chemical conversion of cholesterol. The two forms are traditionally considered equivalent based on their ability to cure rickets, and indeed most of the steps involved in the metabolism and action of vitamin D<sub>2</sub> and vitamin D<sub>3</sub> are identical. Both forms effectively increase 25(OH)D levels. Specific conclusions about any different effects of these

two forms of vitamin D have not been made. The only difference appears when high doses of the vitamin are used, in which case vitamin D<sub>3</sub> is more active.

### The following dosages of vitamin D have been studied in scientific studies:

- to prevent osteoporosis and fractures - 400-1000 International Units per day;
- to prevent falls - 800-1000 IU of vitamin D in combination with 1000-2000 mg of calcium per day;
- to prevent multiple sclerosis - long-term intake of at least 400 IU per day, preferably in the form of multivitamins ;
- to prevent all types of cancer - 1400-1500 mg of calcium per day, in combination with 1100 IU of vitamin D<sub>3</sub> (especially for women during menopause);
- for muscle pain from drugs called statins : vitamin D<sub>2</sub> or D<sub>3</sub> , 400 IU per day.

Most supplements contain 400 IU (10 mcg) of vitamin D.

### The use of vitamin D in traditional medicine

Traditional medicine has long valued foods rich in vitamin D. With them, there are many recipes used to treat certain diseases. The most effective of them:

- **fish oil intake** (both in capsule form and in natural form - eating 300 g / week of oily fish): for the prevention of hypertension, arrhythmias, breast cancer, for maintaining a healthy body weight, against psoriasis and for protecting the lungs when smoking , with arthritis, depression and stress, inflammatory processes. **Recipe for ointment** for skin itching, psoriasis, urticaria, herpetic dermatitis: 1 teaspoon of elecampane, 2 teaspoons of fish oil, 2 teaspoons of melted lard.
- **use of chicken eggs** : raw egg yolk is useful for fatigue and overwork (for example, a mixture of gelatin powder and raw eggs dissolved in 100 ml of water is used; a drink of warm milk, raw chicken yolk and sugar). When coughing, use a mixture of 2 raw yolks, 2 teaspoons of butter, 1 dessert spoon of flour and 2 dessert spoons of honey. In addition, there are several recipes for the treatment of various diseases of the gastrointestinal tract. For example, with unpleasant sensations in the liver, folk recipes advise drinking 2 beaten egg yolks, drinking 100 ml of mineral water and applying a warm heating pad to the right side for 2 hours. There are also eggshell recipes. For example, in chronic catarrh of the stomach and intestines, hyperacidity, constipation or worms, folk recipes advise taking half a teaspoon of ground eggshell in the morning on an empty stomach. And to reduce the risk of stone formation, you can use the calcium salt of citric acid (pour eggshell powder with lemon juice, wine or apple cider vinegar, stir until dissolved, or 2-3 drops of lemon juice are dripped onto 1 tablespoon of egg powder). An infusion of egg shells and citric acid is also considered an effective remedy for arthritis. With sciatica, it is advised to rub the back with a mixture of raw eggs and vinegar. Raw eggs are considered a good remedy for psoriasis, raw yolks (50 grams) are mixed with birch tar (100 grams) and heavy cream. For burns, an ointment is used from the black-fried yolks of hard-boiled eggs.
- **milk** rich in vitamin D is a storehouse of folk recipes for a variety of diseases. For example, goat milk helps with fever, inflammation, belching, shortness of breath, skin diseases, coughs, tuberculosis, sciatica, urinary system, allergies, and insomnia. With a severe headache, it is advised to drink 200 grams of goat's milk with grated viburnum berries with sugar. For the treatment of pyelonephritis, folk recipes advise drinking milk with apple peel. With exhaustion and asthenia, you can use oatmeal in milk (1 cup of oatmeal simmer in the oven with 4 cups of milk for 3-4 hours on low heat). With inflammation of the kidneys, you can use an infusion of birch leaves with milk. It is also recommended to take a decoction of horsetail in milk for

inflammation of the urinary system and edema. Milk with mint will help relieve an attack of bronchial asthma. With constant migraines, a mixture of boiling milk with a fresh egg stirred in it is used for several days - one week. To reduce acidity, pumpkin porridge cooked in milk is useful. With weeping eczema, lubricate the affected areas with a decoction of 600 ml of milk with 100 grams of black radish seeds and 100 grams of hemp seeds (you can also apply compresses for 2 hours). For dry eczema, applications from a decoction of 50 grams of fresh burdock leaves in 500 ml of milk are used.

- **Butter** is used, for example, for bedsores and trophic ulcers - in the form of an ointment from 1 part of marsh cudweed powder, 4 parts of oil and 4 parts of honey.

### Vitamin D in the latest scientific research

- It has been found that taking a high dose of vitamin D for four months can slow down the process of vascular hardening in overweight dark-skinned young people. Hard vessel walls are a harbinger of many deadly heart diseases, and vitamin D deficiency appears to be one of the major contributory factors. According to studies at the Georgia Medical Institute, USA, very high doses of the vitamin (4000 International Units per day, instead of the recommended 400-600 IU) were seen to reduce vascular hardening by a record 10.4 percent in 4 months. 2000 IU lowered it by 2%, 600 IU led to a deterioration of 0.1%. At the same time, in the placebo group, the condition of the vessels worsened by 2.3%. Overweight people, especially black people, are at risk for vitamin D deficiency. Dark skin absorbs less sunlight, and fat prevents the production of the vitamin [25].
- Vitamin D supplements help relieve painful irritable bowel syndrome, according to the latest study from scientists at the University of Sheffield, Department of Oncology and Metabolism. The study found that vitamin D deficiency is common in patients with IBS, regardless of their ethnicity. In addition, the effect of this vitamin in relation to the symptoms of the disease was studied. While scientists believe that further observations are needed, the results already show that taking the vitamin in the dosage form reduces IBS symptoms such as abdominal pain, bloating, diarrhea and constipation. "From the data obtained, it is clear that all people suffering from irritable bowel syndrome should have their vitamin D levels checked. It is a poorly understood disease that directly affects the quality of life of patients. Nowadays, we still do not know what causes it and how to treat it," says Dr. Bernard Corfi, leader of the study [26].
- The results of their clinical trials, published in the Journal of the American Osteopathic Association, show that about one billion of the world's population may suffer from complete or partial vitamin D deficiency due to chronic diseases, as well as due to the regular use of sunscreen. "We're spending more and more time indoors, and when we go outside, we usually put on sunscreen, and ultimately stop our bodies from producing vitamin D," says Kim Pfotenhauer, a doctoral student at Touro University and researcher on the subject. "While overexposure to the sun can lead to skin cancer, moderate amounts of ultraviolet rays are beneficial and necessary for boosting vitamin D levels." It has also been noted that chronic diseases - type 2 diabetes, malabsorption, kidney disease, Crohn's disease, and celiac disease - markedly inhibit the absorption of vitamin D from food sources [27].
- Low amounts of vitamin D in newborns have been associated with an increased likelihood of developing autism spectrum disorders in children as young as 3 years of age, according to a recent study published in the journal Bone and Mineral Research. In a study of 27,940 newborns from China, 310 were diagnosed with autism spectrum disorder at age 3, for a prevalence of 1.11 percent. When comparing data from 310 children with ASD with 1240 controls, the risk of ASD

was significantly increased in each of the three lower quartiles of vitamin D levels at birth compared to the highest quartile: an increased risk of ASD of 260 percent in the lowest quartile, 150 percent in second quartile and 90 percent in the third quartile. " Newborn vitamin D status was significantly associated with the risk of autism and intellectual disability," said senior study author Dr. Yuan-Ling Zheng [28].

- Maintaining adequate levels of vitamin D may help prevent the onset of certain inflammatory diseases, such as rheumatoid arthritis, according to scientists at the University of Birmingham . However, while vitamin D is effective in preventing inflammation, it is not as active once an inflammatory disease has been diagnosed. Rheumatoid arthritis, along with other diseases, leads to resistance to vitamin D in the body. Another key finding of the study was that the effect of vitamin D on inflammation cannot be predicted by studying the cells of healthy people or even the blood cells of those patients who suffer from inflammation. The scientists concluded that even if vitamin D is prescribed for inflammatory conditions, doses must be significantly higher than currently prescribed. Treatment should also correct the vitamin D susceptibility of immune cells in the joint. In addition to the already known positive effect of vitamin D on skeletal tissues, it also acts as a powerful immunity modulator - this vitamin is able to reduce the inflammatory process in autoimmune diseases. Vitamin D deficiency is common in patients with rheumatoid arthritis and can be prescribed by physicians in medicinal form [29].
- Sufficient vitamin D intake during infancy and childhood reduces the risk of developing an autoimmune reaction to the islets of Langerhans (clusters of endocrine cells, mainly in the tail of the pancreas) with an increased genetic risk of type 1 diabetes. "Over the years, there has been controversy among researchers about whether vitamin D can reduce the risk of developing self-immunity and type 1 diabetes," says Dr. Norris , who led the study. Type 1 diabetes is a chronic autoimmune disease that is increasing by 3-5 percent annually worldwide. Currently, the disease is the most common metabolic disorder in children under 10 years of age. In young children, the number of new cases is especially high. And the risks appear to be higher at higher latitudes, further north of the equator. Vitamin D is a protective factor in type 1 diabetes as it regulates the immune system and autoimmunity . Moreover, vitamin D status varies by latitude. But associations between vitamin D levels and autoimmune response to the islets of Langerhans have been inconsistent, due to different study designs, as well as different levels of vitamin D in different populations. This study is unique in its kind and shows that higher levels of vitamin D in childhood significantly reduce the risk of this autoimmune reaction. "Because the current results do not reveal a causal relationship to this process, we are developing prospective studies to see if vitamin D intervention can prevent type 1 diabetes," said Dr. Norris [30].
- According to a study by Queen Mary University of London (QMUL), vitamin D supplementation helps protect against acute respiratory infections and the flu. The findings, which appeared in the British Medical Journal, were based on clinical trials among 11,000 participants in 25 clinical trials conducted in 14 countries, including the UK, the United States, Japan, India, Afghanistan, Belgium, Italy, Australia and Canada. It should be noted that individually these trials showed conflicting results - some participants reported that vitamin D helps protect the body from SARS, and some - that it does not have a noticeable effect. "The fact is that the immune effect of vitamin D supplementation is most pronounced in those patients who initially have low levels of vitamin D, when taken every day or every week." Vitamin D - often referred to as the "sunshine vitamin" - protects the body from airborne infections by increasing levels of antimicrobial peptides - natural antibiotic substances - in the lungs. The result may also explain why we get colds and flu

most often in winter and spring. During these seasons, the level of vitamin D in the body is the least high. In addition, vitamin D protects against asthma attacks that cause respiratory infections. Daily or weekly intake of the vitamin reduced the likelihood of getting SARS in people with levels below 25 nanomoles / liter. But even those who had enough vitamin D in their bodies benefited, although they had a more modest effect (10 percent reduction in risk). In general, the reduction in the risk of catching a cold after taking vitamin D was on par with the protective effect of the injectable flu and SARS vaccine [31].

### The use of vitamin D in cosmetology

Vitamin D can be used in many recipes for homemade skin and hair masks. It nourishes the skin and hair, gives them strength and elasticity, rejuvenates. We offer you the following recipes:

- **Skin masks with fish oil** . These masks are suitable for aging skin, especially dry. Fish oil goes well with honey: for example, a mixture of 1 tablespoon of yeast, full-fat sour cream, 1 teaspoon of fish oil and honey is effective. This mask must first be placed in a water bath in hot water until the fermentation process begins, then stir and apply on the face for 10 minutes. You can also use a mixture of fish oil and honey (1 teaspoon each, with the addition of 1 tablespoon of boiled water) - this mask after 10-12 minutes will help smooth fine wrinkles and improve skin color. Another effective fish oil mask recipe that is suitable for any skin type will give it freshness and beauty. For such a mask, you need to mix 1 teaspoon of eggshell powder, 1 teaspoon of fish oil, 1 egg yolk, 2 teaspoons of mustard honey and half a glass of boiled pumpkin pulp. The mask is applied to the face with warm water, washed off with cool water after 10-15 minutes.
- **Egg skin masks** . These masks are very popular and effective for all ages and skin types. For example, for aging skin, a moisturizing mask with 1 tablespoon of crushed dried lemon peel, 1 egg yolk and 1 teaspoon of olive oil is suitable. For any skin type, a nourishing and cleansing mask of 2 proteins, 1 tablespoon of honey, half a teaspoon of almond oil and 2 tablespoons of oatmeal is suitable. For dry aging skin, you can use a mask of 1 tablespoon of banana puree, 1 egg yolk, sour cream and honey. To get rid of wrinkles, a mask of 1 yolk, 1 teaspoon of vegetable oil and 1 teaspoon of aloe leaf juice (previously aged in the refrigerator for 2 weeks) is suitable. To care for oily skin and narrow the pores, a mask is suitable, which includes 2 tablespoons of cottage cheese, half a teaspoon of liquid honey and one egg. A whitening mask for any skin type contains half a glass of carrot juice, 1 teaspoon of potato starch and half a raw egg yolk, applied for 30 minutes and washed off in a contrasting way - either with cold or hot water.
- **Masks for hair and scalp with vitamin D**. Such masks most often include an egg or egg yolk. For example, for hair growth, a mask is used, which includes 1 tablespoon of lemon juice, 1 tablespoon of onion juice and 1 egg yolk - applied once a week for 2 hours before washing your hair. For dry hair, a mask with 2 egg yolks, 2 tablespoons of burdock oil and 1 teaspoon of calendula tincture is suitable. Nourishing mask for thinning hair - 1 tablespoon of burdock oil, 1 egg yolk, 1 teaspoon of honey, 2 teaspoons of onion juice and 2 teaspoons of liquid soap (apply this mask an hour or two before washing your hair). To strengthen the hair roots and get rid of dandruff, use a mask of infusion of 1 tablespoon of crushed plantain leaves, burdock, 2 tablespoons of aloe juice and egg yolk. Effective masks against hair loss are cinnamon mask (1 egg, 2 tablespoons of burdock oil, 1 teaspoon of ground cinnamon and 1 teaspoon of honey; wash off after 15 minutes) and sunflower oil mask (1 tablespoon of sunflower oil and 1 yolk, washed off after 40 minutes). Also useful for strengthening and shining hair is a mask with 1 tablespoon of honey, 1 tablespoon of castor oil, 1 egg yolk and 1 tablespoon of cognac. To restore dry and damaged hair, use a mask with 2 yolks, 1 tablespoon of hazelnut oil and a drop of lemon essential oil.

## **Use of vitamin D in animal husbandry**

Unlike humans, cats, dogs, rats, and birds need to get their vitamin D from food because their skin is unable to produce it on its own. Its main function in the animal body is to maintain normal bone mineralization and skeletal growth, regulation of the parathyroid gland, immunity, metabolism of various nutrients and protection against cancer. Through research, it has been proven that dogs cannot be cured of rickets by exposure to ultraviolet radiation. For normal development, growth, reproduction, the food of cats and dogs must also contain a sufficiently high amount of calcium and phosphorus, which help the body synthesize vitamin D.

However, because natural foods are low in this vitamin, most commercially prepared pet foods are synthetically fortified. Therefore, vitamin D deficiency in pets is extremely rare. Pigs and ruminants do not need to obtain the vitamin from food, provided they have sufficient exposure to sunlight. Birds that are also exposed to UV rays for a long time can produce some vitamin D, but to maintain skeletal health and egg shell strength, the vitamin must also be supplied through diet. As for other animals, namely carnivores, it is believed that they can get enough vitamin D by eating fat, blood and liver.

## **Use in crop production**

Although adding fertilizer to the soil can improve plant growth, dietary supplements intended for human consumption, such as calcium or vitamin D, are not considered to provide clear benefits to plants. The main plant nutrients are nitrogen, phosphorus and potassium. Other minerals, such as calcium, are needed in small amounts, but plants use a different form of calcium from supplements. According to popular belief, plants do not absorb vitamin D from soil or water. At the same time, there are some practical, independent studies that show that adding vitamin D to the water used to water plants speeds up their growth (because the vitamin helps the roots absorb calcium).

## **Contraindications and warnings**

### **Signs of a Vitamin D deficiency**

The vitamin D molecule is fairly stable. A small percentage of it is destroyed during cooking, and the longer the product is exposed to heat, the more vitamin we lose. So, when boiling eggs, for example, 15% is lost, when frying - 20%, and when baking for 40 minutes, we lose 60% of vitamin D.

The main function of vitamin D is to maintain calcium homeostasis, which is essential for the development, growth, and maintenance of a healthy skeleton. With vitamin D deficiency, it is impossible to get full absorption of calcium and meet the body's need. Vitamin D is essential for effective dietary absorption of calcium from the gut. Symptoms of vitamin D deficiency are sometimes difficult to identify and may include general fatigue and pain. Some people don't show symptoms at all. However, there are a number of common indications that may indicate a lack of vitamin D in the body:

- frequent infectious diseases;
- back and bone pain;
- depression;
- long wound healing;
- hair loss;
- muscle pain.

If vitamin D deficiency continues for long periods of time, it can lead to:

- obesity
- diabetes
- hypertension;
- fibromyalgia ;
- chronic fatigue syndrome;
- osteoporosis;
- neurodegenerative diseases such as Alzheimer's disease.

A lack of vitamin D can be one of the causes of certain types of cancer, especially breast, prostate, and colon cancers.

### **Signs of Too Much Vitamin D**

While for most people, vitamin D supplementation goes well without any complications, cases of overdose do occur occasionally. These are called vitamin D toxicity. Vitamin D toxicity, when it can be harmful, usually occurs if you take 40,000 International Units a day for several months or longer, or take a very large single dose.

An excess of 25(OH)D can develop if you:

- took more than 10,000 IU per day daily for 3 months or longer. However, vitamin D toxicity is more likely to develop if you take 40,000 IU per day every day for 3 months or more;
- have taken more than 300,000 IU in the last 24 hours.

Vitamin D is fat soluble, meaning it is difficult for the body to get rid of it if too much has been taken. In this case, the liver produces too much of a chemical called 25(OH)D. When its level is too high, high levels of calcium in the blood ( hypercalcemia ) can develop.

### **Symptoms of hypercalcemia include:**

- bad feeling;
- poor appetite or loss of appetite;
- feeling of thirst;
- frequent urination;
- constipation or diarrhea;
- abdominal pain;
- muscle weakness or muscle pain;
- bone pain
- confusion;
- feeling tired.

In some rare diseases, hypercalcemia can develop, even when vitamin D levels are low. These diseases include primary hyperparathyroidism, sarcoidosis, and a number of other rare diseases.

Vitamin D should be taken with caution in diseases such as granulomatous inflammation - in these diseases, the body has no control over the amount of vitamin D that it uses, and what level of calcium in the blood it needs to maintain. Such diseases are sarcoidosis, tuberculosis, leprosy, coccidioidomycosis , histoplasmosis , cat scratch disease, paracoccidioidomycosis , granuloma annulare. In these diseases, vitamin D is prescribed only by a doctor and is taken strictly under medical supervision. With great care, vitamin D is taken for lymphoma.

### **Interaction with other drugs**

Vitamin D supplements can interact with several types of medications. A few examples are given below. Individuals taking these medicines on a regular basis should discuss their vitamin D intake with their health care providers.

Corticosteroid drugs such as prednisone, given to reduce inflammation, can decrease calcium absorption and interfere with vitamin D metabolism. These effects may further promote bone loss and osteoporosis. Some weight loss and cholesterol-lowering drugs can reduce the absorption of vitamin D. Seizure control drugs increase liver metabolism and decrease calcium absorption.

## Literature

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[An extended HTML version of the article](#) is available on the website edaplust.info.

## Vitamin D - useful properties, composition and contraindications

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*Получено 25.01.18*

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