

Journal of Healthy Nutrition and Dietetics

In issue:



Calendula



Yarrow



Potato

Detailed description of
useful, healing and
dangerous properties

Application in oriental,
folk and official medicine

Use in cooking and c
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Vitamin C

Top 35 foods rich in vitamin
C, why the body needs it,
daily requirement, signs of
deficiency and excess

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Calendula (Marigolds, lat. *Caléndula*)

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

Keywords: calendula, beneficial properties, potentially dangerous effects, side effects, beneficial properties, contraindications, diets

Useful properties of calendula officinalis

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

trace elements	mg/kg dry weight ^[4]
Iron	533
Manganese	85.9
Zinc	49.9
Copper	15.51
Nickel	5.68
Chromium	4.75
cobalt, lead and cadmium	less than 0.1

What exactly is used and in what form

Medicinal value are marigold flower petals, whole flower inflorescences, and leafy flowering tops. Infusion, tincture, tea, decoctions are prepared from calendula inflorescences. The extract of medicinal marigold is included in the composition of tablets, ointments, lotions. Externally, calendula tincture is used as a lotion, for lubrication and healing of cuts, burns, ulcers and wounds; for douching, rinsing. Marigolds are present in numerous herbal preparations. Calendula is also widely used in homeopathy.

Medicinal properties

Calendula officinalis petals contain volatile oils, flavonoids (heterosides isorhamnetin), carotenoids (carotene, violaxanthin , rubixanthin , flavoxanthin , lycopene), calendine bitterness , triterpene saponins - calenduloses (faradiol , arnidiol and oleanolic acid glycosides), sesquiterpene calendene , resins, mucus, tannins, organic acids, phenol derivatives, antibiotic, sitosterol . ^[5]

Calendula officinalis has anti-inflammatory, bactericidal, wound healing, antispasmodic, hypotensive, cardiotonic and sedative properties; contributes to the acceleration of the metabolic function of the liver (secretory and excretory functions increase, the concentration of bilirubin and cholesterol in bile decreases). A diluted tincture of medicinal marigolds is used to treat leg ulcers, pityriasis versicolor and oily seborrhea of the face, eczema, purulent skin rashes and frostbite, aphthous stomatitis (in the form of rinses), gingivitis, pyorrhea, periodontal disease, tonsillitis and tonsillitis. With erosion of the cervix and trichomonas colpitis prescribe douching, make baths and microclysters for proctitis, paraproctitis, anal fissures. With blepharitis and conjunctivitis, compresses and eye baths are useful. The use of calendula gives a positive therapeutic effect in gastritis, gastric ulcer and duodenal ulcer, colitis, enterocolitis, diseases of the liver and biliary tract (especially in combination with chamomile officinalis and common yarrow). The use of calendula is justified in cardiovascular diseases, accompanied by an accelerated heartbeat, shortness of breath and edema. In gynecological and obstetric practice, an infusion or tincture of calendula is prescribed orally for incessant vomiting in pregnant women, dysmenorrhea, high blood pressure and insomnia in menopause. In folk medicine, medicinal marigolds are used for aphthosis , bronchitis, scrofula, rickets, jaundice, diseases of the bladder and spleen, nervous fever and dizziness. ^[6]

In herbal medicine, calendula in the form of a suspension or tincture is used externally to treat acne , reduce inflammation and soothe irritated skin. Some sources indicate the effective use of calendula ointment or cream in the treatment of radiation dermatitis (skin damage due to radiation exposure). Calendula ointment with radiation dermatitis significantly reduces the pain of the victim. ^[16]

In official medicine

Preparations based on *calendula officinalis*:

- **Tincture of calendula** ;
- **KN tablets** (composed of calendula flower powder and nicotinic acid). Assign to reduce the effects of dyspepsia in oncological diseases of the esophagus, stomach, intestines. Symptomatically, together with nicotinic acid, calendula has a beneficial effect on malignant tumors of the stomach, which are not subject to surgery;
- **Caleflon** (purified extract of *calendula officinalis* flowers in the form of tablets) - used for stomach ulcers, duodenal ulcers, chronic gastritis in the acute phase to eliminate inflammation and accelerate healing;
- **Caferide** (as part of the preparation of iron oxide and marigold flowers). It is prescribed for anemia as a means of stimulating the processes of hematopoiesis. ^[5]

In folk medicine

- With inflammation of the mucous membrane of the digestive tract, half a tablespoon of calendula petals is poured with a glass of boiling water. Let it brew and take a tablespoon every 60 minutes. ^[5]
- With scrofula, rickets and swelling of the spleen, drink 2 glasses a day of tea from marigold flowers and yarrow herb, taken in equal parts.

- For diseases of the liver and biliary tract, take a tablespoon of herbal mixture of St. raw water, insist night, boil for 7 minutes in the morning, insist 20 minutes and take 3 glasses a day.
- With painful menstruation, a tablespoon of a mixture of calendula flowers and mallow flowers (mallow forest) in proportions of 6: 4 per glass of boiling water, insist 20 minutes and take 3 glasses a day.
- With furunculosis, they drink tea from a mixture of marigold flowers, burdock roots, walnut leaves and creeping wheatgrass root (4; 2.5: 1.5: 2). A tablespoon of this mixture is poured with a glass of boiling water, let it brew for a quarter of an hour and take 0.5 cups three times a day. ^[7]
- In case of hypertension, in order to reduce and stabilize blood pressure, a long-term collection is recommended: 9 tablespoons of marigold flowers, pour 0.2 liters of vodka and leave for 10 days in a glass container, in a dark and cool place, shaking from time to time. After that, strain, take 20 drops three times a day with water.
- With angina pectoris, atherosclerosis, hypertension, pain in the heart and neurotic conditions, a collection is useful: a tablespoon of valerian root and dill seeds and 2 tablespoons of licorice root, string grass and calendula flowers. Pour a spoonful of the mixture of all the ingredients with 200 ml of boiling water, boil for half an hour in a water bath, let it brew, strain it chilled. Add boiled water, increasing the volume to 0.2 liters. Drink a third of a glass three times a day for three weeks, then take a break and continue the course for another 2 weeks. ^[eight]
- Powder from calendula flowers is considered a good anti-inflammatory and bactericidal agent: you need to take it three times a day, 0.3 - 0.5 g, washed down with water, or with honey.
- For neuroses, as a sedative: take 2 tablespoons of calendula inflorescences and oregano herbs, a tablespoon of tansy flowers. Mix, pour a tablespoon of the herbal mixture with 200 ml of boiling water, and heat under the lid in a water bath for a quarter of an hour. Then cool and strain. Drink a quarter cup 4 times a day for 3 weeks.
- Calendula tincture at home: to prepare the tincture, you need 40% alcohol . Grind two tablespoons of fresh medicinal marigold inflorescences and pour into a glass dish. Pour the flower mixture with 100 ml of alcohol. Close the container, leave in a dark place for 8 days. Then strain and store in a cold place. ^[9]

Externally:

- For cuts, acne, boils, frostbite, ulcers, lichen, blepharitis, apply marigold steam to the affected area . For rinsing the cavity and throat with tonsillitis, gingivitis, stomatitis, amphotodosis, take one teaspoon of alcohol tincture of calendula in half a cup of boiled water.
- Freckles on the face and hands are removed with a two-time lubrication of juice from calendula leaves, mixed in equal parts with lemon juice, currant berries and almond oil. ^[7]
- If vision falls, lotions from such a mixture are applied to the eyes at night: calendula flowers, blue cornflower petals and flowering eyebright herbs are taken in equal parts. The course of treatment is long, at least six months.
- For douching with cervical erosion, with trichomonas lesions, pathological discharge, prepare an infusion of 4 tablespoons of calendula per liter of boiling water. ^[ten]
- For pain in the joints, rub a few drops of calendula tincture with massage movements into the affected area, then wrap it with a warm scarf or scarf. This treatment should be followed for a week, daily at bedtime. Also, a compress can be applied to the joint: moisten the cloth in tincture, “warm” the finished compress, withstand at least 3 hours. Repeat the procedure daily. ^[9]

in oriental medicine

Indian healers have long used calendula as an antiseptic and stimulant.

The properties of calendula were studied by Avicenna, who highly appreciated the medicinal value of the plant.

Calendula is used in Ayurvedic medicine.

In scientific research

- The medicinal properties of calendula remain the object of modern scientific research.
- J. M. Leach studied the healing abilities of calendula officinalis, its significance in therapy aimed at treating wounds of various etymologies. ^[eleven]
- Phytochemical and ethnopharmacological aspects of representatives of the genus Calendula are covered in the work of D. Arora , A. Rani and A. Sharma. ^[12]
- M. Butnariu and K. Z. Koradini studied the bioactive components of the flowers of calendula officinalis. ^[13]
- Scientific work of Sharova O.V. and Kurkina V.A. dedicated to flavonoids contained in marigold flowers. ^[fourteen]
- The diuretic effect of drugs based on calendula flowers was analyzed in the work of Kurkin V.A., Kurkina A.V., Zaitseva E.N. and others ^[15]
- P. Pomier , F. Gomez and others substantiated in a scientific study the role of calendula in the prevention of radiation dermatitis during irradiation used in the treatment of breast cancer. ^[16]

In cooking

Calendula petals as a natural dye, flavoring agent and flavoring agent are used in the preparation of salads, desserts, drinks, and a variety of vegetarian dishes. Calendula is added to soups, pastries, herbal tinctures, homemade liquors, sauces.

- Rice with calendula

Ingredients you will need: 4 cups water, 1/8 teaspoon salt, half a finely chopped onion, 2 bouillon cubes, half a cup of crushed marigold petals, 2 cups long grain rice. Boil water, add salt, onion, bouillon cubes, marigold petals and rice to boiling water. Stir and cook covered over low heat for 18 minutes.

- Muffins with calendula

You will need: 1 and ¾ cups flour, 2 teaspoons baking powder, 0.5 teaspoon salt, ¼ cup sugar, 2 eggs, 2 tablespoons melted butter, ¾ cup milk, ¾ cup crushed dates, 2 tablespoons marigold petals. Preheat the oven to 220 0. Mix the sifted flour with baking powder, salt and sugar. Beat eggs separately. Combine the egg mixture with milk, butter, dates and calendula petals. Mix all ingredients thoroughly. Pour the batter into the cupcake molds, filling them halfway. Bake for 15-20 minutes. Garnish the finished muffins with calendula flowers and petals.

- Omelet with calendula

To prepare an omelette you will need: 2-3 eggs, 2 tablespoons of milk, a teaspoon of butter or a tablespoon of any vegetable oil, 2 tablespoons of fresh calendula petals, salt and pepper. Beat eggs with milk, salt and pepper to taste. Pour the calendula petals into the egg-milk mixture. Prepare an omelette in a preheated frying pan, greased with oil and sprinkle the finished dish with marigold petals.

- Custard with calendula

It will take 0.5 liters of milk, a cup of marigold petals, a quarter teaspoon of salt, 3 tablespoons of sugar, vanilla on the tip of a knife, 3 egg yolks, 1/8 teaspoon of grated nutmeg and the same amount of allspice, ½ teaspoon of rose water. Grind the calendula petals in a mortar and mix with milk and vanilla. Add beaten egg yolks, salt and sugar with spices (nutmeg and allspice) to the milk mixture. Bring to a boil over medium heat, stirring constantly. Stirring constantly, boil for 5-10 minutes until thickened. Add rose water to the chilled cream. Ready-made custard can be used for making desserts or served as a separate dish, baked. Serve the baked custard with whipped cream and calendula petals.

- Herbal oil with calendula and marjoram

Required products: 200 g butter, 2-3 tablespoons of marigold petals and the same amount of marjoram leaves. Mix the softened butter with calendula and marjoram and bring the mixture to a homogeneous state in a blender. You can add a tablespoon of olive oil, a little lemon juice, salt and pepper to taste. Put the finished butter into a mold or butter dish and freeze in the refrigerator.

- Cornbread with calendula petals

Ingredients: 2 cups whey, 3-4 tablespoons fresh marigold petals, 1.5 cups cornmeal, ¾ cup wheat flour, ¾ cup unbleached flour, 1.5 teaspoons baking powder, ¾ teaspoon salt, 2 large eggs, ¼ a cup of vegetable oil or melted butter, ¼ cup of honey.

Soak calendula petals in whey. Preheat the oven to 190°C. Lubricate the baking dish with oil. Sift corn flour, wheat flour, unbleached flour, baking powder and salt into a large bowl. Beat eggs, add whey, vegetable or melted butter and honey, beat all liquid ingredients for at least a minute. Mix the egg-butter mixture on the whey with the prepared flour. Pour the dough into the mold, bake the bread for 25-30 minutes, until golden brown. Cut and serve when completely cool. ^[17]

Calendula can be salted and pickled and used as a dressing for salads, soups, main dishes.

To pickle calendula, you will need: 1 kg of fresh flower baskets of medicinal marigolds, 0.5 liters of water and 60 g of salt. Boil the water, salt, pour the calendula flowers washed and dried from moisture with boiling brine, cook for 5 minutes. Allow to cool, pour into a glass dish with brine, store in a cool place.

For calendula in marinade, you will need: 1 kg of fresh calendula inflorescences, 0.5 l of 3% vinegar, 40 g of salt and a few black peppercorns. Pour the prepared inflorescences with vinegar, add salt and pepper, and cook for 5 minutes. Pour chilled into storage containers. Store in a dark place.

- Calendula drink with apple juice

A glass of dry marigold inflorescences pour 2 liters of water and boil over low heat for at least 0.5 hours. Leave the decoction for about 8 hours. Then add 400 ml of fresh apple juice and 200 ml of liquid honey to the calendula decoction. Pour the drink into bottles, leave in a cool place. ^[9]

In cosmetology

Calendula is an invariable component of many skincare products. Based on it, tonics, creams, scrubs, rinses, masks, herbal cosmetic ice and soap are created.

- Softening hand mask with calendula

To prepare such a cosmetic product, you will need: 2 tablespoons of oatmeal, 2 teaspoons of lemon juice, 1 teaspoon of fresh marigold petals, a tablespoon of honey, 3 tablespoons of warm water. Mix all ingredients and puree in a blender. Apply to cleansed and slightly damp skin. Withstand 5-10 minutes. Rinse off the mask with room temperature water and lubricate your hands with a nourishing cream. Oatmeal cleanses and softens the skin, lemon juice evens out skin tone and eliminates age spots, calendula and honey soften and heal.

- Hair rinse with calendula

You will need: 0.5 liters of strong herbal calendula tea, a tablespoon of calendula tincture, 3-5 drops of rosemary essential oil. Brew strong tea from calendula flowers. Let stand and cool. Add calendula tincture and rosemary essential oil. Apply to washed and damp hair and scalp. Leave on for a few minutes, then rinse.

- Facial scrub

Ingredients: a cup of oatmeal, half a cup of cornmeal, 1/3 cup of dry marigold petals. Grind all products in a coffee grinder into powder. Store this scrub base in a container with a tight-fitting lid. Before cleansing the face, mix one teaspoon of the dry mixture with a little water. Apply to a damp face and rub into the skin with massaging movements. Wash off with warm water.

- Balm with calendula

It is useful to lubricate scratches, burns, abrasions, bruises with such a balm. For preparation, you need to take 105 g of an oil extract of medicinal marigolds and 150 g of beeswax. Melt the wax in a water bath and combine with calendula extract. Warm up and pour into a small glass container. Store the frozen balm in a dark, dry place.

- Steam bath for the face

Take half a cup of dry marigold petals, lavender flowers, roses and chamomile. Prepare an infusion by pouring about half a cup of such a flower mixture with a liter of boiling water. Steam the skin of the face over the herbal bath for 3 to 7 minutes.

- Bath with calendula

Based on a full bath, prepare an infusion: pour a full cup of dry calendula petals with 2 liters of boiling water. Bring to a boil and let it brew. Add to bath water. This procedure is useful for eczema, hives, rashes. ^[17]

Calendula helps with problem skin. To make an acne lotion at home, you will need: mix a tablespoon of calendula infusion with a tablespoon of camphor alcohol, adding 10 drops of ammonia, mix everything thoroughly and store in the refrigerator. Apply the lotion on the face with rubbing movements, with a cotton pad dipped in the solution, up to 3 times a day. ^[9]

In perfumery

Calendula essence is traditionally used in perfumery. The plant brings bitterness, spice, balsamic note to compositions. Perfume with a well-tangible aroma of marigold – *Interlude Woman by Amouage*.

Other uses

- The juice of fresh marigold leaves is used to treat bee stings. Marigold flower juice is used as a natural dye in the production of cheese and butter. Previously, marigold dyes were also used to color Easter eggs, added to chicken feed to make the egg yolk brighter.
- Thickets of calendula prevent the reproduction of roundworms (nematodes) in the soil.
- Marigolds are considered a natural repellent: marigold bushes planted under the windows of the dwelling repel mosquitoes. Also, the aroma of calendula repels insect pests from beds with potatoes, tomatoes and eggplants.

Dangerous properties of calendula and contraindications

Calendula lowers blood pressure, so hypotension patients should be especially careful with it.

Also, preparations based on calendula can cause an allergic reaction in people with intolerance or predisposition to allergic diseases. During pregnancy and lactation, the advisability of using calendula should be strictly agreed with your doctor. /p>

Since calendula itself has a calming effect on the nervous system (it is used in the treatment of neurosis), the simultaneous use of sedatives and calendula-based drugs is contraindicated: increased drowsiness and lethargy may occur. ^[ten]

Botanical description

It is an annual herbaceous plant of the Compositae (Asteraceae) family.

origin of name

marigold " is firmly entrenched in the calendula . Other name variations: *solstice*, *oil color*, *golden color* . The Latin word *Calendula* is a diminutive of "little calendar," "little clock," and even "little barometer," as calendula flowers close and bloom at certain times of the day, the so-called "flower clock."

Kinds

In botany, from 12 to 20 types of calendula are distinguished, among which:

1. **Calendula officinalis** (*Calendula officinalis*) - grows in the temperate climate zone of Europe, the Australian continent and Asia. Cultivated as a medicinal plant on an industrial scale. Used in the food industry. Within this species, many varieties have been bred. It also has a decorative value;
2. **Field calendula** (*Calendula arvensis*) is an endemic plant of central and southern Europe. Is a source of medicinal raw materials;
3. **Sea calendula** (*Calendula maritima*) - found in the western part of Sicily, grows along the coast. The species is classified as endangered. Sea calendula is the national symbol of the Italian province of Trapani . ^[one]

Calendula officinalis is an annual herb, from 0.3 to 0.5 m high. The root system is taproot, the stem is straight, branched, with longitudinal ribs, densely pubescent with small and hard villi. The leaf arrangement is alternate (spiral), the lower leaves are larger, petiolate, the upper ones are smaller, sessile. Bright yellow or orange flowers with a balsamic aroma are collected in baskets. Reed flowers grow along the edge of the inflorescence, tubular flowers in the middle. The fruit is a seed. Marigolds bloom from June to mid-autumn. Achenes ripen from July. It is grown in horticultural farms, in household plots, it is very rarely found as a weed. ^[2]

Growing conditions

Calendula takes root on any soil, but the highest yield can be obtained with high humidity and in well-lit areas. It is possible to use the area where calendula is grown for many years. On the eve of sowing, the soil is plowed to a depth of 0.2 m. Seeds are sown in early spring. On the beds with the formed seedlings, weeding is carried out and the soil is loosened. Weeding and plowing the soil is repeated 2-3 more times at the beginning of the summer period. It is also advisable to fertilize the soil with fertilizers (up to 2 times). ^[3]

Watering is moderate. Too densely sown calendula can be affected by powdery mildew. Calendula is frost tolerant. In addition to spring sowing, it is possible to sow seeds before winter. Marigolds sprout well from self-seeding. The plant blooms about a month after seed germination. ^[eight]

The collection of inflorescences-baskets is carried out from 8 to 12 times during the entire growing season, since the flowering period of calendula lasts quite a long time. Harvest raw materials in the phase of mass flowering. Those inflorescences are plucked in which the tubular flowers are partially opened, and the reed ones are located horizontally. A part of the peduncle up to 3 cm long may remain at the basket. Calendula is harvested until frost, as it blooms at intervals of 2 to 5 days. After the fourth or fifth harvest, the inflorescences become much smaller. Dry the nails immediately, in the shade, under a canopy, scattering a thin layer on a tarpaulin or burlap and shaking from time to time. The readiness of raw materials is determined by the degree of friability of the inflorescences into pieces. Permissible shelf life is 1 year. ^[2]

Power circuit

The plant serves as food for butterfly larvae, representatives of several common species. Among them are cabbage scoop, currant scoop, large yellow tapeworm, etc.

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

Calendula - useful properties, composition and contraindications

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



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

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

Keywords: yarrow , beneficial properties, potentially dangerous effects, side effects, beneficial properties, contraindications, diets

Useful properties of common yarrow

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

trace elements	mg/kg dry weight ^[4]
Iron	179
Manganese	84.3
Zinc	40.2
Copper	9.88
Nickel	5.54
Chromium	0.26
cobalt, lead and cadmium	less than 0.1

What exactly is used and in what form

Yarrow grass is used in the form of infusions, decoctions, extracts. It is a component of teas that increase appetite, healing fees. Freshly squeezed juice of the plant is used to treat wounds, with internal diseases. Leaves and flowering tops are used in bitters and herbal liqueurs. Both freshly harvested raw materials and dried flowers and leaves of yarrow are used.

Medicinal properties

Yarrow flowers contain the hemostatic bitter alkaloid akhilein , volatile oils containing chamazulene , proazulene , thujone , borneol, pinenes , camphor , eugenol , pineol , flavonoid luteolin-7-glycoside, sesquiterpene lactones (matricine , milefolid , balchanolide - acetate), balchanolide- acetate organic acids (acetic, formic, isovaleric, salicylic), esters and alcohols, choline, asparagine. Yarrow herb contains akhilein bitterness , volatile oils, sesquiterpene lactones, tannins, flavonoids , phytoncides, vitamins C and K, carotene. ^[5]

The versatile therapeutic properties of yarrow are explained by the complex of chemicals contained in the plant. The effective hemostatic effect of yarrow is used for pulmonary, intestinal, hemorrhoidal and nasal bleeding, as well as for bleeding gums, with uterine bleeding (with inflammatory processes, fibromyomas). When using yarrow to stop bleeding, it is the leaves of the plant that should be preferred, since the flowers do not have such an effect. Along with this, yarrow preparations irritate the endings of taste buds and increase the secretory activity of the stomach, dilate the bile ducts, increase bile secretion into the duodenum , increase diuresis, stop spastic pain in the intestines; this causes their use in case of reduced appetite, hypoacid gastritis, peptic ulcer of the stomach and duodenum , ulcerative spastic colitis, flatulence, and diseases of the liver, kidneys and bladder.

With the external use of yarrow as a hemostatic, anti-inflammatory, bactericidal and dermatonic agent, the drugs are effective in alopecia areata (alopecia), excessively oily skin, acne, hemorrhoids and herpes, promote the healing of fresh and festering wounds, ulcers, boils, scaly lichen, stimulate growth hair.

In folk medicine, yarrow is used very extensively. It is taken orally as a means of regulating metabolism, with dizziness, nausea, headache, sleep disturbances, hysteria, chlorosis, malaria and pulmonary tuberculosis, with nephrolithiasis, with enuresis ; yarrow finds application in gynecology -

it is recommended for regulating the menstrual cycle; prescribed to stimulate lactation, and as a remedy for worms.

Monotreatment based on yarrow is rarely used, more often it is combined in collections with other medicinal herbs. Yarrow is a common ingredient in laxative, antihemorrhoid, appetizing and gastric teas. ^[6]

In traditional medicine recipes, yarrow is combined with plants such as lavender, sage, calendula, mint, etc. The most popular and classic combinations are: yarrow in combination with Benedict Pharmacy is often used to improve digestion; sage and yarrow stimulate the outflow of bile and have a beneficial effect on the functions of the liver and stomach; with bloating, flatulence, yarrow paired with lavender helps well, and such a herbal collection also has a calming effect; hemorrhoids are treated with a composition of calendula and yarrow; the symptoms of premenstrual syndrome are relieved by a combination of yarrow and motherwort; a collection of yarrow and corn stigmas is recommended for urinary tract infections; peppermint in combination with yarrow helps with colds, flu.

According to some authors, despite the fact that the yarrow herb increases the number of platelets in the blood, there is no threat of thrombosis. The hemostatic effect of yarrow is associated mainly with the activation of platelets and a reduction in the bleeding period.

The anti-allergic effect of yarrow allows it to be successfully used for diathesis, eczema, urticaria, bronchial asthma, etc. ^[7]

In official medicine

Yarrow preparations available at the pharmacy:

1. yarrow herb;
2. yarrow powder;
3. yarrow extract is rare.

In folk medicine

With intestinal, gastric, hemorrhoidal bleeding, dyspepsia, with mycotic pneumonia (sometimes developing after prolonged use of antibiotics), as well as to prevent the formation of kidney stones, tea is prescribed: a tablespoon of yarrow flowers is brewed in a glass of boiling water. Drink half a glass twice a day. An overdose may cause a headache. ^[5]

With hyperacid gastritis (with high acidity), a collection is recommended: mix yarrow grass, St. John's wort, chamomile flowers and celandine grass (2: 2: 2: 1). Pour a tablespoon of this herbal mixture with a glass of boiling water, let it brew, strain and drink a third of a glass four times a day. Yarrow with gastritis can be recommended as part of a variety of herbal preparations.

For neurosis, tachycardia, combined with sleep disturbance, mix a tablespoon of valerian root, lemon balm leaves and yarrow herb. Pour a glass of boiling water and leave for 3 hours. After that, boil for 5 minutes, strain. Drink a little at a time several times a day. ^[eight]

With severe pain in the stomach, yarrow is used in combination with chamomile flowers (a tablespoon of yarrow herb and chamomile flowers in a glass of boiling water).

In case of inflammation of the bladder, manifestations of calculous pyelonephritis and hematuria caused by stones in the urinary tract, take 2 tablespoons of yarrow, birch buds, bearberry leaves, and a tablespoon of herb cuff and calamus rhizomes mixed with 2.5 cups of raw water, boil the composition 5 minutes, let it brew for 30 minutes, drink the decoction in 4 doses per day.

With a tendency to angina pectoris, spasms of smooth intestinal muscles, a tincture of yarrow is advised: take yarrow flower inflorescences in a ratio of 1:5 to 70% alcohol. Take 20 drops before meals.

For obesity: in tablespoons, measure a mixture of yarrow herb, bearded cystoseira and St. John's wort (4:2:2), pour a glass of water, boil for 5 minutes and take it hot in the morning for a long period.

With a rapid heartbeat, it is useful to take 24 drops of yarrow juice and rue juice for 2 glasses of weak homemade wine (drink twice a day).

For peptic ulcer, boil 2 tablespoons of chopped yarrow herb in a glass of water for about 10 minutes and take a decoction of 0.5 cups, three times a day, a quarter of an hour before meals, for a month.

Yarrow juice mixed with honey is used to improve appetite and speed up metabolism. ^[9]

For anemia, an infusion is used: 60 g of a mixture of dry herbs of yarrow and nettle is poured into a ceramic dish with 2 cups of boiling water, covered tightly and allowed to brew for half an hour. Take a cup once a day (in the morning on an empty stomach or at night). You can divide the amount into 2 doses: half a cup in the morning and half a cup before bed.

For migraine, prepare a collection of hawthorn flowers and yarrow herb (taken in equal parts). A tablespoon of this collection brew 200 ml of boiling water, strain. Drink a quarter cup three times a day before meals.

To increase the amount of breast milk (to stimulate lactation), you can take an infusion: pour a tablespoon of dried yarrow herb with a glass of boiling water, let it brew under a tightly closed lid for 60 minutes, then strain. Drink a tablespoon four times a day before meals.

For painful menstruation, a collection is recommended: take 50 g of yarrow herb, lemon balm leaves and chamomile flowers. Pour a tablespoon of this mixture with a glass of boiling water, let it brew, strain. Drink a third of a glass three times a day.

For nervous disorders, nervous exhaustion and overwork, a collection of such herbs is useful: yarrow, St. John's wort, angelica root (1: 1: 1). Pour a tablespoon of the herbal mixture with a glass of boiling water, leave for 30 minutes under the lid, then strain. Take the infusion one hour before bedtime.

For weight loss, it is also recommended to take an infusion of yarrow, anise and chamomile. Such a drink helps to cleanse the whole body, removes toxins.

With radiculitis, myositis, pain in the lumbar region, pour a tablespoon of dry yarrow with a glass of boiling water, let it brew for 60 minutes, then strain. Drink an infusion of a tablespoon 3-4 times daily before meals.

With hypo- and beriberi, as an antipyretic and tonic for acute respiratory diseases, a healing drink is prepared: 20 g of dried yarrow herb, 400 ml of cranberry juice, a glass of honey, 3 liters of water. Pour herbal raw materials into boiling water, boil for 5 minutes, let it brew for 2 hours, then strain. Combine

the broth with cranberry juice and honey, mix well, pour into a storage container. Store in a dark place.
[ten]

Externally:

With boils, yarrow ointment is recommended: 2 tablespoons of yarrow herb (dry) pour a quarter cup of hot water. Heat the mixture until very hot, then allow to cool. Add 20 g of vaseline, grind until smooth. Lubricate the boil with ointment.

Yarrow poultices are useful for local anesthesia. Pour boiling water over 4-5 tablespoons of dry yarrow herb, wrap in gauze cloth, when warm, such poultices should be applied to inflamed and sore places.

With bruises, swelling, wounds, a compress with yarrow helps: you will need 30 g of yarrow flower inflorescences, 20 g of thyme herb and 10 g of eucalyptus leaves. Collection of herbs pour boiling water and leave for 60 minutes. Then strain. Moisten a clean cloth or gauze with plenty of infusion, apply to the affected area and hold for an hour.

Yarrow bath

Pour 200 g of dry raw materials with 3 liters of boiling water. Let it brew for 30 minutes. Then strain, pour into a full bathroom. Take a bath before going to bed, no more than a quarter of an hour. After warmly take cover. This infusion can also be used in lotions for eczema, ulcers.

With stomatitis, gingivitis, bleeding gums, rinsing with a decoction of yarrow with the addition of sage is useful. [ten]

Powdered yarrow leaves with nettle leaves (in equal proportions) act as a hemostatic and anti-inflammatory.

Juice squeezed from washed, clean yarrow leaves, applied to a fresh wound, stops bleeding and heals.
[7]

For burns, boils, tuberculosis of the skin and for rubbing with alopecia, a recipe is used: a mixture is prepared from fresh, carefully ground yarrow herb and Provence oil (in proportions of 1:10). [6]

The use of yarrow in oriental medicine

In his *Canon of Medicine*, Avicenna praised the medicinal qualities and characteristics of yarrow.

In Chinese folk medicine, one of the representatives of the genus, the Arabic yarrow, is widely used.

In scientific research

British N. Culpeper, physician and botanist, in his work on medicinal plants ("The complete Herbal", 1653), described the properties of yarrow as follows: "yarrow ointment heals wounds. Drinking a decoction of white wine stops bleeding. The plant is used both to treat fresh open wounds, and to heal ulcers and fistulas, weeping wounds ... For toothache, you should chew a few leaves of yarrow ... Yarrow helps with spasms and convulsions. [eleven]

Modern research on yarrow is diverse in subject matter.

- The medicinal properties of representatives of the genus Yarrow are characterized in the study of Sednia S., Gohari A.R., Mokhber-Dezfuli N. and others ^[12]
- The chemical composition of the essential oil of common yarrow was studied in the work of Pokrovskaya I.S., Mazova O.V., Apykhtin N.N., Plemenkov V.V. ^[13]
- Article Chudnovskaya G.V. dedicated to the species Yarrow Asiatica. ^[fourteen]
- Biologically active substances contained in common yarrow are the object of study by Shatalina N.V., Pervyshina G.G., Efremova A.A., Gordienko G.P. and others ^[15]
- A pharmacognostic study of the herb yarrow broad-bladed is presented in the scientific work of Glushko M.P. ^[16]

In cooking

Yarrow greens are added to soups, sauces, stews, salads, as an addition to a side dish. You should know that yarrow leaves are best used in recipes in the spring, in the summer the greens of the plant become coarser, tougher and acquire a bitter aftertaste. Inflorescences -baskets are used in cooking as a spice. Seasoning for meat and other dishes is prepared as follows: dried yarrow flowers are ground in a mortar into powder. The resulting material is sifted through a sieve. Store in a tightly closed jar.

- Yarrow tea

One teaspoon of dried yarrow (or a few fresh leaves), 240 g of boiling water, a slice of lemon, a teaspoon of honey. Boil water, pour yarrow, infuse tea for at least 10 minutes. Add lemon and honey. Drink hot. Honey can be replaced with sugar (cane, coconut). ^[17]

- Pasta with yarrow sauce

To prepare this dish you will need: 240 g of penne pasta , 4 tablespoons of finely chopped garlic, salt to taste, 3 tablespoons of olive oil, 2 teaspoons of finely chopped yarrow leaves, a quarter cup of dry white wine, grated cheese for serving.

Separate the yarrow leaves from the stems, rinse well and finely chop. Boil water, salt, cook penne pasta until tender. Fry garlic in olive oil until golden brown, add wine, hold on fire, combine with ready-made penne and chopped yarrow. Cook for 2 more minutes over low heat. Serve pasta with lettuce leaves and grated cheese.

- Spicy yarrow soup

Ingredients needed: 50 g butter, 2 medium onions, one small head of garlic, 2 teaspoons curry powder, one teaspoon turmeric, 2 tablespoons flour, 3 cups chicken broth, 120 g chopped yarrow leaves, plain yogurt or sour cream for serving.

Melt butter in a frying pan, lightly fry finely chopped onion in butter, combined with garlic, curry and turmeric. Add flour and cook the sauce for a minute. Then add chicken broth, bring to a boil. Add the chopped yarrow leaves and simmer the soup for 15 minutes. Serve hot with sour cream or yogurt.

- Salad of beets and yarrow

450 g beets, 2 teaspoons of sugar, 3 tablespoons of young yarrow leaves, 4 tablespoons of sour cream, 2 tablespoons of red wine vinegar. Boil the beets until tender, peel and cut into cubes. Mix with crushed yarrow leaves, sprinkle with sugar. Dress the salad with sour cream and wine vinegar.

- Salad with yarrow

Soak young yarrow leaves (5 g) for a minute in boiling water, chop well, mix with sauerkraut (150 g), green onions (25 g). Salt and season with vegetable oil (10 g). ^[6]

In cosmetology

Manufacturers of organic cosmetics actively include yarrow extract in the composition of cosmetic products for body and face skin and hair care. Yarrow has a beneficial effect on the condition of sensitive oily skin, regulates the secretion of sebum, tones cells and stimulates regeneration processes, moisturizes, soothes and cleanses the skin; strengthens hair, treats acne and relieves inflammation and burns.

What is useful yarrow for hair? To accelerate hair growth and improve their condition, use the following recipe:

Pour 10 g of crushed dry yarrow flower mass with a glass of boiling water and let it brew for 60 minutes (preferably in a thermos). After that, strain and rub the infusion into the hair roots. Before rinsing and washing with shampoo, moisten the hair with infusion along the entire length. The infusion can be added to rinse water (at the rate of 2 tablespoons per liter of water). ^[ten]

Face mask for oily skin (with excessive sebum production)

Prepare an infusion of yarrow from 3 teaspoons of flower inflorescences of the plant and a glass of boiling water. Mix the infusion with powdered milk powder, starch or flour. Apply the resulting slurry on the face, hold for about a quarter of an hour, then rinse. ^[6]

Other uses

The yarrow planted on the garden plot perfectly copes with the role of a fighter against insect pests, and also repels ants.

A concentrated infusion of yarrow herb is an effective means of controlling garden pests (spider mites, aphids, scale insects, thrips).

Some birds (for example, starlings) use yarrow stems when building nests. As it turned out, the plant repels many parasitic insects that attack bird nests.

Yarrow essential oil is used in winemaking, the alcoholic beverage industry and perfumery.

Yarrow is a good nectar plant.

Dangerous properties of yarrow and contraindications

Prolonged uncontrolled use and overdose of yarrow preparations can lead to allergic skin rashes and dizziness. Pregnancy, thrombophlebitis and increased blood clotting are also factors that limit the possibility of treatment with yarrow. ^[6,8]

Botanical description

It is a perennial herb of the **Asteraceae** (*Asteraceae*) family.

origin of name

people, the grass is called *bloodworm*, *sickle cutter*, *mother liquor*, *cutter*, *goulyavitsa*, *white-headed*, *carpenter's grass*. The Latin generic name of yarrow - **Achillea** - has several interpretations. According to the most common version, the plant was named after the hero Achilles, who was the first to use the herb for medicinal purposes, healing the bleeding wounds of Telephus with yarrow. The origin of the name is also associated with the Greek words "**akhilos**" ("*abundant food*") and "**akhilon**" (translated as "*thousand*", meaning numerous excisions of the leaves of the plant).

Kinds

About 150 species of yarrow are known to science, including:

1. **Yarrow** is a common medicinal plant, cultivated as a honey plant, has a decorative value, is used as a spice. Grows in the European region, in the Caucasus, in Siberia, in the Far East, in Asia;
2. **Ptarmic yarrow** - the species has medicinal value, it is also grown as an ornamental plant. Growth area - Europe, the European part of Russia. Many cultivars have been bred within the species;
3. **Yarrow willow** - common in Asia and Eastern Europe;
4. **Yarrow Arabic** (Bieberstein) - grows in the Central Asian region, in the European part of Russia, in the Balkans, the Caucasus, in Afghanistan and Iran. Included in the Red Book of the Volgograd region;
5. **Yarrow bristly** - a species common in Europe, found in Altai, in some Siberian regions, in Central and Asia Minor, in the Mediterranean. ^[one]
6. **Yarrow naked** - one of the rarest representatives of the earth's flora. Included in the European Red List. This endemic plant is found in the protected area on the granite sections of the Bestash mountain;
7. **Yarrow noble** - grows in Western Siberia, the European part of Russia;

Yarrow is a herbaceous perennial plant with a height of 0.4 m to 1 m. The rhizome is creeping, branched. Stems are straight, ribbed, rarely pubescent. The leaf arrangement is alternate, the leaves are linear-lanceolate, doubly pinnately dissected into linear segments. The leaves at the roots are petiolate, and those that are located on the stems are sessile. Small baskets of inflorescences are collected at the top of the stems in complex shields. Reed flowers in baskets are white or pale pink, tubular flowers are yellow. Seed fruit. The flowering period begins in summer and ends by mid-autumn. Achenes ripen in August-September.

It occurs along roads, on hills, slopes, in fields, forest clearings, between bushes, in meadows. ^[2,3]

Growing conditions

Yarrow grows in both abundantly lit and shaded areas. It tolerates wintering under a large layer of snow, without requiring additional insulation. It adapts to any soil, but the soil of medium moisture, loose and fertilized with fertilizers, is optimal.

The plant is propagated by seed and division of rhizomes. In the prepared soil in the spring or autumn, the roots dug in advance and divided into 4 parts are planted, with an interval of 0.2 m. A distance of 0.3 m is maintained between the rows. Subsequently, the beds are weeded and the soil is loosened. Watering is rare. Seeds are sown immediately after they are collected. Shoots appear in the spring of the following year, after which they are thinned out.

In the second year of the life of the yarrow, it is advisable to feed with ammonium nitrate, and with the onset of autumn - with potassium salt and superphosphate.

The plant can grow in one area up to 10 years. Easily tolerates division and transplantation. [3,8]

How and when to collect yarrow? Grass, leaves and flowers are harvested in the flowering phase (from June to October). The tops of the stems are cut off up to 20 cm long, the surface thickened parts of the stems are not collected. Inflorescences are cut off or cut off shields with a stem no more than 2 cm long. The raw materials are dried in the open air or in a room with good ventilation, spread out in a thin layer. Shelf life of dry material is 5 years. [2]

Power circuit

Wasps, as well as numerous species of butterflies (adults) and beetles feed on pollen and nectar collected from yarrow.

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Yarrow - useful properties, composition and contraindications

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



Картофель (Паслён клубненосный, лат. *Solánium tuberósum*)

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

Keywords: potatoes , useful properties, potentially harmful effects, side effects, beneficial properties, contraindications, diets

Beneficial features

Chemical composition and presence of nutrients

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

Main substances (g / 100 g):	Raw white potatoes contain: ^[20]
Water	81.58
Carbohydrates	15.71
Squirrels	1.68
Fats	0.1
Calories (kcal)	69
Minerals (mg/100 g):	
Potassium	407

Phosphorus	62
Magnesium	21
Sodium	16
Calcium	9
Vitamins (mg/100 g):	
Vitamin B4	eleven
Vitamin C	9.1
Vitamin B-3	1.066
Vitamin B- 5	0.281
Vitamin B-6	0.203

The most useful potatoes are baked in their skins, which are often called jacket potatoes. It also benefits the use of boiled tubers, but fried potatoes should not be abused, since such heat treatment dramatically increases the content of fat and harmful substances that digestive enzymes do not cope well with.

Medicinal properties

The beneficial effect of potatoes on various processes in the human body is explained by the presence of a large number of useful elements in its composition. Firstly, potatoes are a rich source of ascorbic acid or vitamin C. Although in smaller quantities, they also contain B vitamins. Secondly, due to the high starch content, potatoes supply a significant amount of carbohydrates to the body and give a person energy and vitality. Thirdly, potato proteins provide the human body with 14 of the 20 essential amino acids.

In addition, in any form and with any heat treatment, potatoes are very rich in potassium. This mineral contributes to the fight against hypertension, as it promotes vasodilation. Potassium also has a diuretic property and is necessary for people suffering from gout, acidosis, cystitis and prostatitis. Promoting the removal of excess fluids from the body, potassium thereby helps it maintain a normal metabolism [7].

Iron, phosphorus, calcium, magnesium and zinc contained in potatoes help the growth and strengthening of bones. At the same time, it is important that the body maintains a balance of phosphorus and calcium, since an excess of phosphorus and a lack of calcium can lead to increased bone fragility and, as a result, to osteoporosis. [8].

Vitamin C, which is so rich in potatoes, is a powerful antioxidant that takes part in the neutralization of free radicals in the human body and thus helps prevent the destruction of cells and connective tissues. It promotes collagen production and aids in iron absorption [9]. Together with vitamin B, as well as magnesium, potassium, phosphorus and zinc, vitamin C has a positive effect on skin condition and relieves pain from minor burns [10].

Vitamin B6, combining with various enzymes, plays an important role in the processing of proteins and carbohydrates, and also takes part in the process of fat metabolism. In addition, B6 promotes the synthesis of hemoglobin and, in general, improves hematopoiesis [9]. Vitamin B9 (folic acid), in turn, is of great importance for DNA synthesis and red blood cell regeneration. Its presence in the body is especially important for women during pregnancy, since B9 is involved in the regulation of the formation of the structures of the fetal nervous system [8].

The presence of coarse dietary fiber in potatoes, in particular fiber, has a positive effect on cholesterol levels and helps prevent clogging of the arteries. Also, fiber helps to normalize the stool with

constipation. True, it must be borne in mind that the bulk of dietary fiber, however, like other useful elements, is located in the potato peel or directly under it.

In traditional medicine

In traditional medicine, potato tubers themselves are not used directly, but products obtained during their processing, as well as leaves, flowers and fruits of the potato bush are used. For example, potato starch is commonly found in powders and ointments prescribed for various skin conditions. It is also used as a binder in the manufacture of tablets. In addition, high-quality ethyl alcohol is obtained from potato starch.

The entire upper part (stems, leaves, flowers, fruits) of the potato bush contains glycoalkaloid solanine, toxic to humans and animals. However, scientific studies have shown that in small doses and in combination with other components, solanine can be useful. For example, it is used as a raw material for the synthesis of hormones in the pharmaceutical industry.

In folk medicine

Unlike traditional medicine, in folk recipes, the range of potatoes is much wider. Potatoes are used to treat colds, ulcers, cardiovascular diseases, get rid of allergic reactions, and some even claim the effectiveness of potatoes in the fight against cancer. However, before starting treatment with potatoes, you should consult a doctor, since improper or untimely use of potatoes can only aggravate the situation.

- **Juice**

It is believed that potato juice is effective in the fight against stomach ulcers and gastritis. It also normalizes the digestion process and relieves heartburn. The positive effect is mainly due to the presence of starch in the composition of the tubers - a good enveloping agent. In addition, juice is indicated for diabetics (mild to moderate diabetes), as it normalizes carbohydrate metabolism. Potato juice also helps to cleanse the body of toxic elements and toxins. For such purposes, it is often mixed with celery or carrot juice.

Before starting juice therapy, it is advised to exclude meat, fish, spices and spices from the diet for several days, replacing them with products of plant origin. This will help prepare the body for the intake of raw potato juice.

Usually, in case of violations of the gastrointestinal tract, it is recommended to drink one glass of juice after waking up on an empty stomach, then go to bed for another half an hour, and after another half an hour you can have breakfast. A ten-day course of treatment with juice should be replaced by a ten-day break. Then the course can be repeated again. For heart problems, it is advised to drink 100 ml of juice three times a day before meals. The course lasts three weeks, after which one week break is needed.

For the preparation of potato juice, you need to choose unsprouted healthy tubers. It is important that the peel does not have a greenish tint, which indicates the presence of a toxic substance in the tuber. It is also not recommended to squeeze the juice from February until the new potato crop, since solanine accumulates in it and the amount of useful elements decreases.

The selected potatoes must be washed, wiped and passed through a juicer. An alternative way is to rub the potatoes on a grater or pass through a meat grinder, and then strain through cheesecloth. It is best to drink the prepared juice immediately, because during storage it darkens, becomes reddish, and its vitamin activity is significantly reduced.

- Compresses

Potato compresses are used for various purposes. Firstly, it is believed that they help get rid of coughs. The effect is achieved by reducing the swelling of the airways and increasing the expectoration of mucus by warming the chest. To prepare a compress, you need to wash and boil 3-5 tubers in a peel. Then mash the potatoes, put them in gauze and apply to the back and chest of the patient, wrapping him in a towel for 45-60 minutes. The procedure can not be performed on children under 4-5 years old. Also, the compress is contraindicated if the patient has a fever.

Secondly, potato compresses are recommended for joint pain. 200-300 g of raw potatoes must be grated and mixed with the same amount of grated horseradish roots. The resulting mass must be applied to the legs, covering with a cellophane film and insulating with a woolen cloth. Usually such a compress is done at night.

Thirdly, potato compresses can be useful if you have dark circles and “bags” under the eyes due to fatigue and lack of sleep. To prepare a compress, you need to wash and grate one potato on a fine grater. Then divide the resulting mass in half, wrap both parts in gauze and apply to the eyes for 10 minutes.

- Inhalations

In acute respiratory diseases, which are accompanied by a cough, it is recommended to do inhalation over potatoes. Potatoes are boiled without salt in a small amount of water. A towel is thrown over the head and the steam is breathed for 5-10 minutes.

- Decoction

In potato broth, there are many vitamins and minerals that tubers are rich in. Traditional healers claim that it can be used to relieve swelling and improve heart function. It is recommended to cook potatoes in their skins and without salt. Drink a warm decoction three times a week. It is also believed that potato broth baths are good for the skin of the hands, as they make it soft and promote the healing of minor wounds.

- Tinctures

In folk medicine, in addition to the tubers themselves, potato flowers are also used, from which tinctures are prepared. They are considered effective in the fight against fungi. According to the recipe, a small amount of flowers (about 1 tablespoon) is poured into 250 ml of boiling water and infused for 3-4 hours in a thermos. This tincture is stored in the refrigerator for no more than two days. For longer storage (within two weeks), the resulting tincture must be mixed with 30 ml of alcohol or vodka.

Some traditional healers use tinctures from the flowers to treat cancerous tumors. According to the recipe, 1 tablespoon of flowers should be poured with two glasses of boiling water, and then infused for about 30 minutes. After that, leave for about 3 hours in a sealed container in the oven. The resulting liquid must be drunk three times a day, 100 ml. The course of treatment is 3 weeks. However, such treatment must be used very carefully, since the concentration of alkaloids in the flowers of the plant is much higher than in the tubers.

in oriental medicine

In the classical oriental treatises on medicine, there was no mention of potatoes, because at the time of their writing, potatoes were not yet known in those parts. However, for example, in modern Tibetan

medicine, it is believed that this vegetable benefits the nervous system (the Rlung system in terms of Tibetan medicine), which regulates all processes in the body.

gradual depletion of the Rlung system leads to aging of the body, and the use of potatoes helps to maintain and strengthen this system, slowing down aging. Potatoes also have antidepressant properties and help the body recover from stress. In addition, it is considered a prophylactic against insomnia. Moreover, potatoes have a positive effect on the work of the cardiovascular and digestive systems.

Potatoes are often excluded from the number of healthy vegetables, since oriental medicine classifies them as "cooling" foods, that is, those that slow down metabolism. In fact, it is easy to compensate for this by adding "warming" salt, black and red pepper, garlic, dill or ghee to the potatoes.

In Tibetan medicine, it is believed that "disease enters and exits the body through the skin." The "exit" of the disease is usually accompanied by skin inflammation, which thinly sliced potatoes can cope with. Applying raw potatoes is also advised in case of first and second degree burns.

In scientific research

Potato has long been and does not cease to be the object of scientific research in various areas. Such interest is explained by the fact that potatoes are a product that can provide millions of people with food and a complex set of useful elements at a minimal price. Researchers are studying ways to improve the methods of planting, growing, harvesting and storing potatoes, developing methods for selecting potatoes for certain modes of growing them, and selecting environmentally friendly technologies for protection against harmful organisms and pathogens.

In addition, potatoes are actively researched in medicine. Pigs have shown that raw or cooked potatoes, eaten cold, have beneficial effects on the intestines and strengthen the immune system ^[11]. Also, American scientists have developed a variety of "golden" potatoes, which contains more vitamins and minerals. Thus, it provides almost 42% of the daily value of vitamin A and 34% of vitamin E for a child ^[12]. This variety is planned to be brought to developing countries, where people suffer from a lack of wholesome and healthy food.

The researchers also concluded that the virus that most commonly infects potato plants is very similar to one of the proteins that cause Alzheimer's disease. Now they are using this similarity to create antibodies that would help at least slow down the onset of the disease ^[13]. Americans also believe that purple potatoes help kill cancer stem cells in the colon. Experiments on mice have shown that the flesh of baked purple potatoes removes inflammation and inhibits the growth of tumors ^[14].

Ethyl alcohol is obtained from the waste generated during the processing of potatoes, but Russian scientists talk about the possibility of obtaining other high-quality antimicrobial agents ^[15]. Finally, in the UK, potato starch has been used to produce biodegradable medium-density fibreboard (MDF), which is highly sustainable ^[16].

Weight regulation

Despite the fact that the potato occupies a leading position among the most high-calorie vegetables, it is unfairly considered a forbidden product for people who follow their figure. Scientists from the US National Nutrition Center conducted a study and found that due to the large amount of potassium in its composition, the potato helps to remove excess fluids from the body and thus can even lead to the loss of extra pounds.

Overweight problems arise only if potatoes are eaten fried or seasoned with fatty sauces. Boiled, stewed or baked, potatoes can even become the basis of an unloading diet if, instead of fish and meat, they are consumed with other vegetables and spices.

Due to the fact that potatoes have good taste and high nutritional value, rich in vitamins and minerals, easy to digest, they are widely used in baby and diet food. Potatoes are usually recommended for patients with chronic renal failure, cardiovascular diseases, arterial hypertension, atherosclerosis, and gastrointestinal diseases. However, potatoes are not recommended for people suffering from severe forms of diabetes and obesity ^[17].

In cooking

Potato is a versatile vegetable that is used in recipes around the world. Potatoes are an indispensable ingredient in soups and a good side dish. In addition, it is put in salads, pies, meat dishes, pancakes are made on its basis. Cooking potatoes is easy. Both by itself and as part of various dishes, it is most often boiled, stewed or baked in the oven.

In order for the dish to turn out as tasty as possible, you should choose the right potatoes. According to the density of the pulp, it is customary to divide it into 4 types: A, B, C and D. Type A potatoes contain a minimum of starch and are poorly boiled. It is most often used for salads. Type B potatoes are good for making chips, and type C are good for deep frying. Type D is the most mealy variety and is best for casseroles and mashed potatoes.

However, the label is usually only on imported potatoes. In case of its absence, you can navigate by color. Red varieties of potatoes ("red-tamb", "rozeval", "sheri") are characterized by a high content of antioxidants and do not crumble during cooking. Usually such potatoes are well stored in the winter. White varieties ("erow", "tiras", "gypsy") contain a lot of vitamin C and, as a rule, such potatoes boil well. Yellow varieties ("symphony", "rosalind", "adretta") are rich in carotene and retain their shape when cooked.

Combination with other products

According to adherents of a healthy diet, traditional combinations of potatoes with meat, fish or eggs are unacceptable. It is believed that starchy foods do not mix well with animal proteins. So, to digest potatoes, the body secretes alkaline enzymes, which are dissolved by hydrochloric acid, produced by the stomach to process meat. Thus, not fully digested foods enter the intestines, where the fermentation process can begin with the active release of toxins.

A combination of potatoes with vegetable oil, sour cream, cheese, green vegetables, as well as legumes is considered healthy and useful.

Beverages

Drinks made from potatoes have a specific taste, but are considered very beneficial for the body. Raw potato juice and potato broth are recommended to drink as a cure for various diseases. Often beets, celery or carrots are added to potato juice. In addition, a traditional drink is prepared from the tubers - natural live kvass. With the addition of oatmeal from potatoes, you can even make jelly, which is considered a soothing detoxifier.

Dangerous properties of potatoes and contraindications

Despite the exceptional usefulness and importance of potatoes in the diet, it can be consumed only with some reservations:

- only potato tubers should be eaten, since the upper part of the bush (stems, leaves, flowers and fruits) contains the alkaloid solanine, which can cause poisoning of the body;
- green and sprouted potatoes should also not be eaten due to their toxicity;
- juice from raw potatoes can be prepared up to a maximum of February, since after that solanine begins to accumulate in the tubers themselves and in their peel;
- during the preparation of potatoes at a temperature of 120 degrees and above, the amino acid asparagine contained in its composition is transformed into a carcinogenic substance acrylamide, therefore, any other method of heat treatment, except for frying, is preferable;
- potatoes are not recommended for obese people;
- potatoes should be used with caution in patients with severe diabetes.

Botanical description

From a botanical point of view, the potato is a perennial tuberous plant of the nightshade family. But in everyday life, the potato is often referred to as the "second bread" because, along with wheat, rice, corn and sugarcane, it is one of the five most important agricultural crops in the world ^[1,2].

Story

The history of the potato has more than one millennium, and scientists believe that for the first time wild species of this plant began to be eaten as early as the 5th century BC. ancient Indians who lived in South America. When and how the potato left its homeland is not known for certain, but it is believed that it came to Europe through the Iberian Peninsula and the British Isles in the middle of the 16th century ^[3].

In Spain, and especially in Ireland, potatoes quickly became a solid staple of the diet of the locals, however, in the rest of Europe they were not very popular and for a long time were considered the creation of the hands of the devil. Nevertheless, information about the true value of potatoes nevertheless spread over time throughout the Old World and, contrary to initial mistrust, they began to grow and use it in Germany, the Netherlands, Belgium, France and other European countries.

The first who, at the end of the 16th century, described the potato and assigned it the modern scientific name *Solanum tuberosum* (lat. tuberous nightshade), became the Swiss botanist Kaspar Baugin ^[4]. As for the everyday name of the potato, it varies depending on the country. So, for example, the Russian name "potato" comes from the German word "kartoffel", which in turn was borrowed from the Italian language. In Italy, potatoes were called "tartufoli" by analogy with truffles (it. tartufo), since its tubers, like truffle tubers, are located underground.

The English name "potato" comes from the Spanish word "patata". The Spaniards, in turn, adopted the name from the Indians, combining their words "papa" (potato) and "batata" (sweet potato). In France, potatoes are still called "pomme". de terre " (fr. earthen apple) ^[5].

Varieties

Given that the potato is an unpretentious plant, it can be grown on a wide variety of soils, regardless of the climatic conditions and temperature fluctuations ^[6]. That is why this crop is cultivated in more than a hundred countries of the world with a temperate, subtropical and tropical climate. However, to obtain a quality crop, you need to know which variety is suitable for the soil and weather conditions of a particular area.

There are a huge number of varieties of potatoes (about 4000), ranging from various wild species in South America to species carefully bred by breeders. Usually, varieties are divided into categories depending on the ripening time: 70-80 days (early ripening), 90-120 days (mid-ripening), 140-150 days (late-ripening) ^[1].

In addition to well-known varieties such as Adretta, Riviera, American or Granada, which correspond to the traditional ideas about the appearance of potatoes (brown skin and light yellowish flesh), there are also very unusual varieties with colored flesh or variegated external color. For example, potatoes of the Vitelotte variety have a rich purple color of the pulp, while potatoes of the All variety Blue both the skin and the flesh are blue. The Bikini variety has an unusual red-yellow skin, the Christina tubers have a dark red skin, and the Shetland potato is black on the outside.

Growing features

Potato is considered a perennial plant and in its homeland, in South America, it is often found in the wild. However, in Europe it is grown as an annual plant. Depending on the variety, a potato bush can reach 30 to 150 cm in height and have 4 to 8 stems. The color of the leaves varies from light green to dark green with a brown tint ^[1]. At the tips of the stems, small inflorescences of white, pink or lilac usually appear, depending on the variety.

Closer to autumn, fruits form on the bush - small fleshy berries of green-white color. The tops and berries contain the poisonous substance solanine, which protects the plant from harmful bacteria and insects. The tubers used for food are located underground. On the outer part of the potato there are so-called eyes (from 3 to 15 buds on one tuber), which subsequently develop into young shoots. Potatoes can be grown in any open field, in greenhouses and even in pots.

The planting time of this plant depends on the timing of the maturation of the tubers. Early varieties are usually planted when the soil warms up to 10°C, although some gardeners choose lunar days for planting potatoes. However, the preparation of planting material begins 30-40 days before disembarkation. Tubers the size of a chicken egg, selected in the fall, are scattered on the floor or laid out in one layer in boxes and stored at a temperature of 12-15 °C, always in the light and at high humidity.

The planting of potatoes itself can be carried out in different ways, depending on the density of the soil. In hot climates and light loose soil, pits are made for potatoes, while in humid climates in damp soil, ridges are cut under the potatoes, raising the planting above ground level. Sometimes seed propagation is used. To do this, take seeds from ripe potato fruits and plant them in boxes, leaving them in a lighted place. Seedlings 13-15 cm high are transplanted in early May.

Growing potatoes is certainly accompanied by pest control. The Colorado potato beetle and wireworm are a real scourge for potato plantations. Larvae and adults of the Colorado potato beetle eat both the leaves of the potato bush and the tubers themselves. As for the wireworm, the danger is only the larva of this insect, which gnaws through the roots and tubers, which leads to the withering and decay of the plant. To get rid of these pests, you have to use chemicals.

Selection and storage

You should not take a green or already sprouted potato, it contains alkaloids that can provoke poisoning. Small holes, deep grooves and brown spots indicate that the potato has been exposed to pests. High-quality potatoes should be firm and resilient without external damage and defects. If the potato gives in to the pressure of the nail and liquid begins to ooze from it, it is most likely that nitrates

were used during cultivation. And when you pierce the skin of a good, pesticide-free potato with your fingernail, you will hear a crisp crispy sound.

If you need to choose potatoes for storage for the winter, then varieties of medium and late ripening are suitable. It is also worth paying attention to the size of the root crop. Medium and small tubers contain more nutrients. In addition, the maturity of the potato depends on the thickness of the peel - the thicker it is, the more mature the potato is considered and the better it should be stored. Cleaned from the ground and dried tubers are best kept at a temperature of 2-7 ° C. Also, potatoes need to be sorted out from time to time, getting rid of rotten root crops in order to avoid the spread of infections.

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Potatoes - useful properties, composition and contraindications

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



Витамин С (аскорбиновая кислота) - описание, польза и где содержится

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Abstract. The article discusses the main properties of vitamin C 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 C are indicated. 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 C on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: vitamin C, beneficial properties, potentially dangerous effects, side effects, beneficial properties, contraindications, sources

Story

The importance of vitamin C has been scientifically recognized after centuries of failures and fatal illnesses. Scurvy (a disease associated with a lack of vitamin C) haunted mankind for centuries, until finally attempts were made to cure it. Patients often experienced symptoms such as rashes, loose gums, multiple bleeding, pallor, depression, and partial paralysis.

- 400 BC Hippocrates first described the symptoms of scurvy.
- Winter 1556 - there was an epidemic of the disease that swept the whole of Europe. Few knew that the outbreak was caused by a shortage of fruits and vegetables during those winter months. Although this was one of the earliest reported scurvy epidemics, not much research has been done on a cure for the disease. Jacques Cartier, a famous explorer, noted with curiosity that his sailors, who ate oranges, limes, and berries, never got sick with scurvy, and those who had the disease recovered.

- In 1747, James Lind, a British physician, first established that there was a definite relationship between diet and the incidence of scurvy. To prove his point, he injected lemon juice into those who were given the diagnosis. After several doses, the patients were cured.
- In 1907, studies showed that when guinea pigs (one of the few animals that can contract the disease) were infected with scurvy, a few doses of vitamin C helped them recover completely.
- In 1917, a biological study was carried out to identify the antiscorbutic properties of foods.
- In 1930, Albert Szent-Györgyi proved that *hyaluronic acid*, which he extracted from the adrenal glands of pigs in 1928, has an identical structure to vitamin C, which he was able to obtain in large quantities from sweet peppers.
- In 1932, in their independent research, Heworth and King established the chemical composition of vitamin C.
- In 1933, the first successful attempt was made to synthesize ascorbic acid, identical to natural vitamin C - the first step towards the industrial production of the vitamin since 1935.
- In 1937, Heworth and Szent-Györgyi received the Nobel Prize for their research on vitamin C.
- Since 1989, the recommended dose of vitamin C per day has been established and today it is enough to completely defeat scurvy ^[3,4].

Foods rich in vitamin C

Table 1. Products with the maximum content of vitamin C ^[5-8]

Product	Quantity (mg/100 gr)
Rose hip	426
Guava	228.3
Bell pepper	Yellow -183.5 Green - 127.7 Red - 80.4
Black currant	181
Parsley	133
curly cabbage	120
Kiwi	92.7
Broccoli	89.2
Dill	85
Brussels sprouts	85
Lychee	71.5
Kohlrabi	62
pomelo	61
Papaya	60.9
snow peas	60
Strawberry	58.8
Orange	53.2
Lemon	53
Cauliflower	48.2
A pineapple	47.8
Chinese cabbage	45
Mango	36.4
Grapefruit	34.4
Lime	29.1
Spinach	28.1

Gooseberry	27.7
Mandarin	26.7
Raspberry	26.2
Blackberry	21
Cowberry	21
Raw potatoes	19.7
honey melon	eighteen
Basil	eighteen
Tomato	13.7
Blueberry	9.7

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

Daily requirement for vitamin C

In 2013, the European Scientific Committee on Nutrition stated that the average vitamin C requirement for healthy levels is 90 mg/day for men and 80 mg/day for women. The ideal amount for most people has been found to be around 110 mg/day for men and 95 mg/day for women. These levels were sufficient, according to the expert panel, to balance the metabolic losses of vitamin C and maintain plasma ascorbate concentrations of about 50 $\mu\text{mol/L}$.

Age	Men (mg per day)	Women (mg per day)
0-6 months	40	40
7-12 months	fifty	fifty
1-3 years	fifteen	fifteen
4-8 years old	25	25
9-13 years old	45	45
14-18 years old	75	65
19 years and older	90	75
Pregnancy (18 years and under)		80
Pregnancy (19 years and older)	-	85
Breastfeeding (18 years and under)	-	115
Breastfeeding (19 years and older)	-	120
Smokers (19 years and older)	125	110

The recommended intake for smokers is 35 mg/day higher than for non-smokers as they are exposed to increased oxidative stress from toxins in cigarette smoke and generally have lower blood levels of vitamin C.

The need for vitamin C increases:

Vitamin C deficiency can occur when taking an amount below the recommended amount, but which is not enough to cause a complete deficiency (approximately 10 mg / day). The following populations are most at risk of getting insufficient vitamin C:

- smokers (active and passive);
- infants who consume pasteurized or boiled breast milk;
- people with a limited diet that does not include enough fruits and vegetables;
- people with severe intestinal malabsorption, cachexia, some types of cancer, kidney failure with chronic hemodialysis;
- people living in a polluted environment;
- during wound healing;
- while taking oral contraceptives.

The need for vitamin C also increases with severe stress, lack of sleep, SARS and influenza, anemia, and cardiovascular diseases ^[12].

Physical and chemical properties

The empirical formula of vitamin C is $C_6H_8O_6$. It is a crystalline powder, white or slightly yellow in color, practically odorless and very sour in taste. The melting point is 190 degrees Celsius. The active components of the vitamin are usually destroyed by heat treatment of foods, especially in the presence of traces of metals such as copper. Vitamin C may be considered the most unstable of all water-soluble vitamins, but it can withstand freezing nonetheless. Easily soluble in water and methanol, oxidizes well, especially in the presence of heavy metal ions (copper, iron, etc.). Upon contact with air and light, it gradually darkens. In the absence of oxygen, it can withstand temperatures up to 100°C ^[9-11].

Water-soluble vitamins, including vitamin C, dissolve in water and are not deposited in the body. They are excreted in the urine, so we need a constant supply of the vitamin from the outside. Water-soluble vitamins are easily destroyed during storage or food preparation. Proper storage and use can reduce the loss of vitamin C. For example, milk and grains should be stored in a dark place, and water in which vegetables have been boiled can be used as a base for soup. ^[12].

Useful properties of vitamin C

Like most other micronutrients, vitamin C has several functions. It is a powerful antioxidant and a cofactor for several important reactions. It plays an important role in the formation of collagen, the substance that makes up most of our joints and skin. Because the body can't repair itself without collagen, wound healing depends on getting enough vitamin C - which is why one of the symptoms of scurvy is unhealed open sores. Vitamin C also helps the body absorb and use iron (which is why anemia can be a symptom of scurvy even in people who consume enough iron).

In addition to these benefits, vitamin C is an antihistamine: it blocks the release of the neurotransmitter histamine, which causes swelling and inflammation in an allergic reaction. This is why scurvy usually comes with a rash, and also why getting enough vitamin C helps relieve allergic reactions ^[14].

Vitamin C has also been linked to some non-communicable diseases such as cardiovascular disease, cancer, and even Alzheimer's disease. Studies have found a link between vitamin C and a reduced risk of cardiovascular disease. Several meta-analyses of vitamin C clinical trials have shown improvements in endothelial function and blood pressure. High levels of vitamin C in the blood reduce the risk of stroke by 42%.

Recently, medicine has become interested in the possible benefits of intravenous vitamin C in maintaining quality of life in patients receiving chemotherapy. Decreased levels of vitamin C in the tissues of the eye were associated with an increased risk of cataracts, which are most common in older people. In addition, there is evidence that people who consume enough vitamin C have a lower risk of

developing arthritis and osteoporosis. Vitamin C also has a high activity against lead poisoning, presumably preventing its absorption in the intestines and aiding its excretion in the urine ^[16,38].

The European Scientific Committee on Nutrition, which provides scientific advice to policy makers, has confirmed that there has been a significant improvement in health in people who have taken vitamin C. Ascorbic acid contributes to:

- protection of cell components from oxidation;
- the normal formation of collagen and the functioning of blood cells, skin, bones, cartilage, gums and teeth;
- improved absorption of iron from plant sources;
- normal functioning of the immune system;
- normal energy-intensive metabolism;
- maintaining the normal functioning of the immune system during and after intense physical activity;
- regeneration of a simplified form of vitamin E;
- normal psychological state;
- reduce feelings of tiredness and fatigue.

Pharmacokinetic experiments have shown that plasma vitamin C concentration is controlled by three primary mechanisms: intestinal absorption, tissue transport, and renal reabsorption. In response to increased oral doses of vitamin C, plasma vitamin C concentrations rise sharply at doses of 30 to 100 mg/day and reach a steady-state concentration (60 to 80 $\mu\text{mol/L}$) at doses of 200 to 400 mg/day per day in healthy young adults. 100% absorption efficiency is observed with oral vitamin C in doses up to 200 mg at a time. After plasma levels of ascorbic acid reach saturation, additional vitamin C is primarily excreted in the urine. Notably, intravenous vitamin C bypasses absorption controls in the gut so that very high plasma concentrations of ascorbic acid can be achieved; over time, renal excretion restores vitamin C to baseline plasma levels.

Vitamin C for colds

Vitamin C plays an important role in the immune system, which is activated when the body encounters infections. The study found that prophylactic use of ≥ 200 mg vitamin C supplementation significantly reduced the duration of cold episodes: in children, the duration of cold symptoms was reduced by about 14% and in adults it was reduced by 8%. In addition, a study in a group of marathon runners, skiers, and soldiers who train in the Arctic found that doses of the vitamin from 250 mg/day to 1 g/day reduced the incidence of colds by 50%. Most preventive studies have used a dose of 1 g/day. When treatment was started from the onset of symptoms, vitamin C supplementation did not reduce the duration or severity of the illness, even at doses of 1 to 4 g/day ^[38].

How is vitamin C absorbed?

Since the human body is unable to synthesize vitamin C, we must include it in our daily diet. Dietary vitamin C in the reduced form of ascorbic acid is absorbed through the intestinal tissues, through the small intestine, by active transport and passive diffusion using SVCT 1 and 2 carriers.

Vitamin C does not need to be digested before absorption. Ideally, about 80-90% of the vitamin C consumed is absorbed from the intestines. However, the absorption capacity of vitamin C is inversely related to intake; it tends to be 80-90% effective at fairly low intakes of the vitamin, but these percentages drop markedly at daily intakes greater than 1 gram. Given a typical dietary intake of 30-180 mg/day, absorption is typically in the 70-90% range, but increases to 98% at very low intakes (less than 20 mg). Conversely, at intakes over 1 g, absorption tends to be less than 50%. The whole process

is very fast; the body takes what it needs within about two hours, and within three to four hours, the unused portion is out of the bloodstream. Everything happens even faster in people who drink alcohol or cigarettes, as well as under stress. Many other substances and conditions can also increase the body's need for vitamin C: fever, viral illnesses, antibiotics, cortisone, aspirin, and other pain medications, exposure to toxins (eg, petroleum products, carbon monoxide) and heavy metals (eg, cadmium, lead, mercury).

In fact, the white blood cell concentration of vitamin C can be as high as 80% of the plasma concentration of vitamin C. However, the body has a limited storage capacity for vitamin C. The most common storage sites are the adrenal glands (about 30 mg), pituitary gland, brain, eyes, ovaries, and testicles. Vitamin C is also found, albeit in smaller amounts, in the liver, spleen, heart, kidneys, lungs, pancreas, and muscles. Plasma concentrations of vitamin C increase with increased intake, but up to a certain limit. Any intake of 500 mg or more is usually excreted from the body. Unused vitamin C is excreted from the body or first converted to dehydroascorbic acid. This oxidation occurs mainly in the liver and also in the kidneys. Unused vitamin C is excreted in the urine ^[13].

Interaction with other elements

Vitamin C is involved, along with other antioxidants, vitamin E and beta-carotene, in many body processes. High levels of vitamin C increase blood levels of other antioxidants, and the therapeutic effects are more significant when used in combination. Vitamin C improves the stability and utilization of vitamin E. However, it can interfere with selenium absorption and should therefore be taken at different times.

Vitamin C may protect against the harmful effects of beta- carotene supplements in smokers. Smokers tend to have low levels of vitamin C, and this can lead to accumulation of a harmful form of beta-carotene called free radical carotene, which is formed when beta-carotene acts to regenerate vitamin E. Smokers who take beta- carotene supplements may also Vitamin C should be taken.

Vitamin C aids in the absorption of iron, helping to convert it into a soluble form. This reduces the ability of food components such as phytates to form insoluble complexes with iron. Vitamin C reduces the absorption of copper. Calcium and manganese supplements may decrease vitamin C excretion, and vitamin C supplements may increase manganese absorption. Vitamin C also helps reduce folic acid excretion and deficiency, which can lead to increased vitamin B6 excretion. Vitamin C helps protect against the toxic effects of cadmium, copper, vanadium, cobalt, mercury and selenium ^[17].

Food combination for better absorption of vitamin C

Vitamin C helps to absorb the iron contained in the liver.

The iron found in parsley improves the absorption of vitamin C from lemon.

The same effect is observed when combined:

- artichoke and sweet pepper:
- spinach and strawberries.

Vitamin C in lemon enhances the effect of kahetins in green tea.

The vitamin C in tomatoes pairs well with the fiber, healthy fats, protein, and zinc found in chickpeas.

A similar effect has a combination of broccoli (vitamin C), pork and shiitake mushrooms (sources of zinc) ^[15].

The difference between natural and synthetic vitamin C

In the rapidly growing dietary supplement market, vitamin C can be found in many forms with varying claims regarding its effectiveness or bioavailability. Bioavailability refers to the extent to which a nutrient (or drug) becomes available to the tissue for which it is intended after it has been administered. Natural and synthetic L-ascorbic acid are chemically identical and there are no differences in their biological activity. The possibility that the bioavailability of L-ascorbic acid from natural sources may differ from the biosynthesis of synthetic ascorbic acid has been investigated and no clinically relevant differences have been observed. However, getting the vitamin in the body is still desirable from natural sources, and synthetic supplements should be prescribed by a doctor. Only a specialist can determine the required amount of vitamin that the body needs. And by eating a nutritious diet of fruits and vegetables, we can easily provide our body with an adequate supply of vitamin C ^[18].

The use of vitamin C in official medicine

Vitamin C is important in traditional medicine. Doctors prescribe it in the following cases:

- with scurvy: 100-250 mg 1 or 2 times a day, for several days;
- for acute respiratory diseases: 1000-3000 milligrams per day;
- to prevent harm to the kidneys during diagnostic procedures with contrast agents: 3000 milligrams is prescribed before the coronary angiography procedure, 2000 mg on the evening of the procedure and 2000 milligrams after 8 hours;
- to prevent vascular hardening: gradual-release vitamin C is given at 250 mg twice a day, in combination with 90 mg of vitamin E. This treatment usually lasts about 72 months;
- for tyrosinemia in preterm infants: 100 mg;
- to reduce the amount of proteins in the urine in patients with type 2 diabetes: 1250 milligrams of vitamin C in combination with 680 International Units of vitamin E, every day for a month;
- to avoid complex pain syndrome in patients with fractures of the bones of the hand: 0.5 grams of vitamin C for a month and a half ^[19].

Vitamin C supplements come in a variety of forms:

- **Ascorbic acid** is, in fact, the proper name for vitamin C. This is the simplest form of vitamin C and, most often, the most reasonably priced. However, some people note that it is not suitable for their digestive system and prefer either a milder form or one that is released in the intestines within a few hours and reduces the risk of digestive upsets.
- **Vitamin C with bioflavonoids** - polyphenolic compounds found in foods high in vitamin C. They improve its absorption when taken together.
- **Mineral ascorbates** are less acidic compounds recommended for people suffering from gastrointestinal problems. The minerals with which vitamin C is combined are sodium, calcium, potassium, magnesium, zinc, molybdenum, chromium, manganese. Such drugs are usually more expensive than ascorbic acid.
- **Ester -C®**. This version of vitamin C contains mainly calcium ascorbate and vitamin C metabolites, which increase the absorption of vitamin C. Ester C is usually more expensive than mineral ascorbates.
- **Ascorbyl palmitate** is a fat-soluble antioxidant that allows molecules to be better absorbed into cell membranes ^[20].

In pharmacies, vitamin C can be found in the form of swallow tablets, chewable tablets, oral drops, soluble powder for oral administration, effervescent tablets, lyophilisate for injection (intravenous and intramuscular), ready-made injection, drops. Chewable tablets, drops, and powders are often fruit-flavored for a more pleasant taste. This makes it especially easier for children to take the vitamin ^[21].

Application in traditional medicine

First of all, traditional medicine considers vitamin C as an excellent cure for colds. It is recommended to take a solution for influenza and SARS, consisting of 1.5 liters of boiled water, 1 tablespoon of coarse salt, juice of one lemon and 1 gram of ascorbic acid (drink for one and a half to two hours). In addition, folk recipes suggest drinking teas with cranberries, raspberries, lingonberries. Vitamin C is advised to take for the prevention of cancer - for example, eating tomatoes with olive oil with garlic, pepper, dill and parsley. One of the sources of ascorbic acid is oregano, indicated for nervous excitement, insomnia, infections, as an anti-inflammatory and analgesic ^[39-41].

Latest Scientific Research on Vitamin C

- British scientists from the University of Salford have found that the combination of vitamin C (ascorbic acid) and the antibiotic doxycycline is effective in the fight against cancer stem cells in the laboratory. Professor Michael Lisanti explains: "We know that during chemotherapy some cancer cells develop resistance to the drug, we have been able to understand how this happens. We suspected that some cells might change their source of nutrition. That is, when one nutrient becomes unavailable due to chemotherapy, cancer cells find another source of energy. The new combination of vitamin C and doxycycline limits this process, causing the cells to "starve to death." Since both substances are non-toxic in themselves, they can drastically reduce the number of side effects compared to traditional chemotherapy ^[22].
- Vitamin C has shown its effectiveness in the fight against atrial fibrillation after heart surgery. According to researchers from the University of Helsinki, the number of post-operative fibrillation in patients who took vitamin C decreased by 44%. Also, the time spent in the hospital after surgery decreased when taking the vitamin. Note that the results were indicative in the case of intravenous administration of the drug into the body. When taken orally, the effect was significantly lower ^[23].
- Studies performed on laboratory mice and tissue culture preparations show that taking vitamin C together with anti-tuberculosis drugs significantly reduces the duration of treatment. The results of the experiment were published in the journal of the American Society for Microbiology, Antimicrobial Agents and Chemotherapy. Scientists treated the disease in three ways - anti-tuberculosis drugs, exclusively vitamin C and their combination. Vitamin C had no apparent effect on its own, but in combination with drugs such as isoniazid and rifampicin, it significantly improved the condition of infected tissues. Sterilization of tissue cultures occurred within a record seven days ^[43].
- Everyone knows that overweight and obese people are strongly advised to exercise, but unfortunately, more than half of the people do not follow this advice. However, the study presented at the 14th International Endothelin Conference may be good news for those who don't like to exercise. As it turns out, taking vitamin C daily may have similar cardiovascular benefits to regular exercise. Vitamin C can decrease the activity of the ET-1 protein, which contributes to vasoconstriction and increases the risk of cardiovascular disease. A daily intake of 500 milligrams of vitamin C has been found to improve vascular function and reduce ET-1 activity as much as a daily walk would be effective ^[24].

The use of vitamin C in cosmetology

One of the main effects of vitamin C, for which it is valued in cosmetology, is its ability to give youthful and toned skin. Ascorbic acid helps to neutralize free radicals that activate skin aging, restores water balance and tightens fine wrinkles. If you choose the right components for the mask, then vitamin C as a cosmetic product (both natural products and dosage form) can be used for any skin type.

For example, for oily skin, the following masks are suitable:

- with clay and kefir;
- with milk and strawberries;
- with cottage cheese, strong black tea, liquid vitamin C and sea buckthorn oil.

Dry skin will regain its tone after masks:

- with egg yolk, a little sugar, kiwi juice and sesame oil;
- with kiwi, banana, sour cream and pink clay;
- with vitamins E and C, honey, milk powder and orange juice.

If you have problem skin, you can try the following recipes:

- mask with cranberry puree and honey;
- with oatmeal, honey, vitamin C and milk slightly diluted with water.

For aging skin, such masks are effective:

- a mixture of vitamins C (in powder form) and E (from an ampoule);
- blackberry puree and ascorbic acid powder.

should be careful with open wounds on the skin, purulent formations, with rosacea and varicose veins. In this case, it is better to refrain from such masks. Masks should be applied to clean and steamed skin, used immediately after preparation (to avoid the destruction of active ingredients), and also apply a moisturizer and do not expose the skin to open sunlight after applying masks with ascorbic acid ^[25].

Taking a sufficient amount of vitamin C has a beneficial effect on the condition of the hair, improving blood circulation in the scalp and nourishing the hair follicles. In addition, by eating foods rich in vitamin C, we help maintain the health and beautiful appearance of the nail plates, preventing their thinning and delamination. Once or twice a week it is useful to take baths with lemon juice, which will strengthen the nails. ^[26, 27].

The use of vitamin C in industry

The chemical composition and properties of vitamin C provide a wide range of industrial applications. About a third of the total production is used for vitamin preparations in the pharmaceutical industry. The rest is mainly used as food additives and feed additives to improve the quality and stability of products. For use in the food industry, the E-300 supplement is produced synthetically from glucose. This produces a white or light yellow powder, odorless and sour in taste, soluble in water and alcohol. Ascorbic acid added to food during processing or before packaging protects color, flavor and nutrient content. In meat production, for example, ascorbic acid makes it possible to reduce both the amount of added nitrites and the nitrite content in general in the finished product. Adding ascorbic acid to wheat flour at the production level improves the quality of baking. In addition, ascorbic acid is used to increase the clarity of wine and beer, to protect fruits and vegetables from browning, and as an antioxidant in water and to protect against rancidity in fats and oils.

In many countries, including European ones, ascorbic acid is not allowed to be used in the production of fresh meat. Due to its color-preserving properties, it can give the meat a false freshness appearance. Ascorbic acid, its salts and ascorbic palmitate are safe food additives and are allowed in food production.

In some cases, ascorbic acid is used in the photo industry for film development ^[28,29].

Vitamin C in crop production

L-Ascorbic Acid (Vitamin C) is just as important for plants as it is for animals. Ascorbic acid functions as a major redox buffer and as an additional factor for enzymes involved in the regulation of photosynthesis, hormone biosynthesis, and the regeneration of other antioxidants. Ascorbic acid regulates cell division and plant growth. Unlike a single pathway responsible for the biosynthesis of ascorbic acid in animals, plants use several pathways for the synthesis of ascorbic acid. Given the importance of ascorbic acid in human nutrition, several technologies have been developed to increase ascorbic acid content in plants by manipulating biosynthetic pathways.

Vitamin C in plant chloroplasts is known to help prevent the reduction in growth that plants experience when exposed to excessive amounts of light. Plants get vitamin C for their own health. Through the mitochondria, as a response to stress, vitamin C enters other cellular organs such as chloroplasts, where it is needed as an antioxidant and coenzyme in metabolic reactions that help protect the plant ^[30,31].

Vitamin C in animal husbandry

Vitamin C is vital for all animals. Some of them, including humans, primates and guinea pigs, get the vitamin from outside. Many other mammals, such as ruminants, pigs, horses, dogs, and cats, can synthesize ascorbic acid from glucose in the liver. In addition, many birds can synthesize vitamin C in the liver or kidneys. Thus, the need for its use has not been confirmed in animals that can independently synthesize ascorbic acid. However, cases of scurvy, a typical symptom of vitamin C deficiency, have been reported in calves and cows. In addition, ruminants may be more prone to vitamin deficiency than other domestic animals when ascorbic acid synthesis is impaired, as vitamin C is easily destroyed in the rumen. Ascorbic acid is widely distributed throughout all tissues, both in animals capable of synthesizing vitamin C and in those dependent on a sufficient amount of the vitamin. In experimental animals, vitamin C peaks in the pituitary and adrenal glands, with high levels also found in the liver, spleen, brain, and pancreas. Vitamin C also tends to be localized around healing wounds. Its level in tissues decreases with all forms of stress. Stress stimulates the biosynthesis of the vitamin in those animals that are capable of producing it. ^[32,33].

Contraindications and warnings

Vitamin C is easily destroyed by high temperatures. And because it is water-soluble, this vitamin dissolves in liquids used for cooking. Therefore, to obtain the full amount of vitamin C from foods, it is recommended to eat them raw (for example, grapefruit, lemon, mango, orange, spinach, cabbage, strawberries) or after minimal heat treatment (broccoli).

The first symptoms of vitamin C deficiency in the body are weakness and fatigue, muscle and joint pain, rapid bruising, and a rash in the form of small red-blue spots. In addition, symptoms include dry skin, swollen and discolored gums, gum bleeding, delayed wound healing, frequent colds, tooth loss, and weight loss ^[42].

The current recommendation is that doses of vitamin C above 2 g per day should be avoided to prevent side effects (bloating and osmotic diarrhoea). Although it is believed that excessive consumption of ascorbic acid can lead to a number of problems (eg, birth defects, cancer, atherosclerosis, increased oxidative stress, kidney stones), none of these adverse health effects have been confirmed, and there are no reliable scientific evidence that large amounts of vitamin C (up to 10 g/day in adults) are toxic or harmful to health. Gastrointestinal side effects are usually not serious and usually resolve when high doses of vitamin C are reduced. The most common symptoms of excess vitamin C are diarrhea, nausea, abdominal pain, and other gastrointestinal problems.

Some medicines can lower the level of vitamin C in the body: oral contraceptives, high doses of aspirin. Simultaneous intake of vitamin C, E, beta-carotene and selenium may lead to a decrease in the effectiveness of cholesterol-lowering drugs and niacin. Vitamin C also interacts with aluminum, which is part of most antacids, so you need to take a break between taking them. In addition, there is some evidence that ascorbic acid may reduce the effectiveness of some cancer and AIDS drugs.

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Vitamin C (ascorbic acid) - description, benefits and where it is contained

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Abstract. The main properties of vitamin C and its effect on the human body are considered in the article. A systematic review of modern specialized literature and current scientific data has been conducted. The best natural sources of vitamin C are indicated. The use of vitamin in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of vitamin C on the human body in certain medical conditions and diseases have been analyzed separately.