



Buckwheat

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

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

Beneficial features

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

Main substances (g / 100 g):	Buckwheat contains ^[5]
Water	8.41
Carbohydrates	74.95
Alimentary fiber	10.3
Squirrels	11.73
Fats	2.71
Calories (kcal)	346
Minerals (mg/100 g):	
Potassium	320
Calcium	17
Phosphorus	319
Magnesium	221
Sodium	eleven
Iron	2.47
Zinc	2.42
Vitamins (mg/100 g):	

Niacin	5.135
Vitamin B-6	0.353
Riboflavin	0.271
Thiamine	0.224
folate	0.042

Buckwheat contains up to 20% protein (with amino acids such as lysine and tryptophan), up to 80% starch, sugar - 0.3-0.5%, organic acids (malic, citric, oxalic, maleic), vitamins B1 (thiamine), B2 (riboflavin), P (rutin), PP (nicotinic acid), anthocyanins, salts of iron, calcium, phosphorus and trace elements - copper, zinc, boron, iodine, nickel, cobalt. The aerial part of the plant during the flowering period contains a flavone glycoside (vitamin) - rutin (1.9-2.5%).^[2]

Use in medicine

For therapeutic purposes, seeds and grass of buckwheat (flowers together with apical leaves) are used. Grass (as a pharmaceutical raw material) is cut at the stage of buckwheat flowering, when the level of rutin in the plant reaches its maximum amount. The flowers are harvested for the production of herbal preparations. The raw material is not available in the pharmacy assortment.

Buckwheat is a product whose dietary value is difficult to overestimate. Especially useful is the use of dishes from buckwheat for diseases of the stomach and intestines, for anemia, disorders of the nervous system, and kidney diseases. Rutin is produced from buckwheat grass, which is used for the prevention and treatment of hypo- and vitamin P deficiency; in the treatment of diseases that are accompanied by impaired vascular permeability (hemorrhagic diathesis, capillary toxicosis, retinal hemorrhage, hypertension and radiation sickness, glomerulonephritis , rheumatism, septic endocarditis). A number of drugs are produced on the basis of rutin: *urutin* , *rutamine* , *ascorutin* , etc. In folk medicine, buckwheat flower infusion is drunk when coughing. Thoroughly crushed and sifted buckwheat leaves are used as a natural powder for diaper rash in children.

Application in official medicine

For the purpose of prevention (and in the treatment of hypo- and avitaminosis of vitamin P), Rutin is prescribed (Rutinum). It is used 2 tablets 2 to 3 times a day. The duration of the course is 5-6 weeks.

Use in traditional medicine

- As **an expectorant**, an infusion of buckwheat flowers is used (40 g of flower raw materials per liter of boiling water): drink 200 ml up to 5 times a day.
- With a **dry cough** , a mixture is prepared from the flowers of buckwheat (50 g), forest mallow (60 g), wild poppy, common white and herb lungwort officinalis (10 g each). Pour a liter of boiling water over the herbs and let it brew overnight. Take a glass up to 5 times a day.
- With bronchitis, which is accompanied by a dry, debilitating cough, an infusion is useful: flowers of buckwheat (40 g), common white, black elderberry, heart-shaped linden (20 g each), wild poppy flowers, scepter -shaped mullein , forest mallow and medicinal lungwort grass (30 each). d) steamed in a liter of boiling water, kept overnight, then filtered and drink 50 ml of the drug every hour.^[eight]
- For arthritis, polyarthritis, various sclerotic lesions, convulsive conditions, an infusion is taken: 4-6 tablespoons of dried leaves, herbs and flowers of buckwheat are steamed in a liter of boiling water. Drink chilled, up to 4 glasses per day.
- With **neurasthenia**, **low blood pressure** with a feeling of weakness, they drink the infusion described above, 100 ml up to 4 times a day.

- Dry raw materials of buckwheat grass (crushed tops or leaves and flowers) are included in the composition of medicinal infusions from herbal mixtures and are taken for sore throat, laryngitis, neuritis, pain with sciatica, hepatitis, and obesity.

Externally:

- Fresh, washed buckwheat leaves are applied as compresses to unopened purulent wounds, abscesses.
- From a concentrated infusion (2 tablespoons of buckwheat herb per 200 ml of boiling water), lotions, compresses for abscesses, panaritiums, phlegmons, ulcers are made. They wipe the scalp with infusion for baldness, treat burns with sterile cotton wool, prepare an infusion for washing the eyes (for cataracts). [2]

Use in oriental medicine

Eastern recipe recommends buckwheat in combination with pomegranate sauce for anemia. Hard grains of buckwheat are used in Indian and Chinese medicine in therapeutic massage sessions.

In scientific research

Due to its prevalence, useful properties and specifics of cultivation, buckwheat has become an object of study in both agronomic and medical research.

In the "Collection of Economic Rules" (1670), F. Udolov said the following about buckwheat: "It will not be unprofitable if other bread is canceled, and buckwheat is sown instead."

In the "Instruction on speculative and record-keeping agriculture" (1786), the first Russian manual on agronomy, scientist M.G. Livanov wrote about buckwheat: "this grain is very useful and beneficial for various needs in housebuilding. It spreads so strongly that no grain of bread can compare with it.

The founder of scientific agronomy in Russia I.M. Komov in his treatise "On Agriculture" (1788) emphasized that "Greeks are sown more, and are better used, and known in Russia than in all of Europe. For there only birds and cattle are fed with it, and in our country the most nutritious food for humans is prepared from it. Komov also mentioned the ability of buckwheat to "drown out" wild, weedy herbs, forcing them out of the land.

A century later, the famous Russian agronomist A.N. Engelhardt extolled buckwheat in his Letters from the Village, where it was said that "buckwheat porridge never gets boring, and it is eaten willingly every day."

In the 20th century, the historian and researcher of culinary traditions V. Pokhlebkin devoted an extensive article to the "buckwheat" issue. ("The hard fate of Russian buckwheat"). [3]

The medicinal properties of buckwheat, its potential as part of medical diets and standard diets for weight loss, the impact of bioactive substances on health were studied at one time by O. Sitar, M. Breshtik, M. Zivtsak; HA. Jimenez- Bastida, H. Zelinsky. [9,10]

For weight loss

Buckwheat porridge is an integral part of both therapeutic diets on medical advice (dietary tables) and the classic mono-diet for weight loss (with or without kefir).

Use in cooking

- From buckwheat, you can cook both crumbly porridge and “slurry porridge”. Soups and buckwheat hominy are cooked with buckwheat. Pancakes and pancakes are baked from buckwheat flour, flour is used as a basis for sauces. Buckwheat flour is also used in the confectionery industry: for the manufacture of chocolate and chocolates. Whole buckwheat is used to make granola, homemade bread.
- The legendary V. Pokhlebkin in “Secrets of Good Cuisine” wrote the following about buckwheat porridge: “buckwheat porridge is the simplest in terms of cooking, which has a good natural protective coating of each grain and does not emit mucus (starch) during cooking. It is difficult to spoil buckwheat porridge, and yet it is often prepared clumsily, tasteless. The secrets of properly cooked buckwheat porridge, according to Pokhlebkin, are as follows: a) cereals and water for cooking should be taken at the rate of 1: 2; b) porridge should be cooked in a metal pan or cauldron with a thickened convex bottom, the lid should fit snugly; c) cook over high heat until the water boils, then maintain a moderate boil, at the final stage of cooking, you need to increase the fire as much as possible so that the water completely boils away and evaporates not only from the surface of the porridge, but also from the bottom of the saucepan or pot. It is not recommended to stir the porridge, slightly open the lid. The peculiarity of boiled buckwheat is that porridge is cooked rather with the help of steam. Delicious crumbly porridge is obtained if steam is not lost and intervention in the cooking process is minimized.
[eleven]
- Buckwheat noodles (made from buckwheat flour) were made centuries ago in Tibet and northern China because wheat flour was not common in those regions. Later, the recipe for noodles made from buckwheat flour migrated to Japanese and Korean cuisines. In Japan, buckwheat noodles are referred to as “soba”. In some areas of Italy, a pasta is made from buckwheat flour, which is called “pasta di grano saraceno”.
- Hindus in northern India eat buckwheat flour during fasting days, as grains (such as rice or wheat) are forbidden foods during fasting. Buckwheat flour pancakes are called “kuttu” in India ki puri”, and potato slices rolled in buckwheat flour and fried in oil - “kuttu pakoras”.
- Pork sausage (or sausage) wrapped in a buckwheat pancake is a type of fast food street food in some regions of France.
- “Steep” is a dish popular in certain provinces of Holland, which is served as follows: a portion of buckwheat porridge is made into a recess, where they put fried bacon flavored with gravy.
- In vegetarian cuisine, buckwheat grains are germinated and then eaten raw or after heat treatment.^[12]
- Buckwheat groats, based on the degree of grinding, are divided into types: *prodel* (crushed, chopped buckwheat grains obtained by hulling), *Smolensk buckwheat groats* (maximum crushed and polished buckwheat grains) and *core* (whole buckwheat grains, hulled from the shell). Another variety is “*veligorka*” - a very small whole grain, the grains of which are rolled to a rounded shape. The most useful is the core, in which the whole complex of trace elements and vitamins is preserved.^[3]

Homemade whole grain buckwheat bread (no flour)

Ingredients: 3 cups whole buckwheat kernels, 1 teaspoon salt, 1 cup water, vegetable oil for greasing the pan, sesame or poppy seeds for sprinkling. Pour buckwheat with water and leave overnight. In the morning, drain the water, let the grits drain. Combine buckwheat with salt, a cup of water and puree in a blender until smooth (grind the ingredients for at least 2-3 minutes). Pour the “dough” into a clean glass container, cover with a towel and leave to ferment in a warm place for a day. The next day, preheat the oven to 200 degrees. Grease a baking dish with vegetable oil, and generously sprinkle the bottom and sides of the form with sesame or poppy seeds. Pour the “dough” into a mold and bake at

180 degrees for an hour. Ready bread cut already completely cooled. For the preparation of such buckwheat bread, green buckwheat (not heat-treated) is also perfect. If desired, crushed olives, pumpkin seeds, raisins can be added to the dough. ^[13]

The combination of buckwheat with other products

In dishes, buckwheat goes well with greens and vegetables with a moderate or reduced starch content. It is better to avoid adding cheese, nuts or seeds to the buckwheat product. Also, nutritionists strongly do not recommend mixing buckwheat with animal proteins, sweet fruits and sugar. If desired, you can sweeten the porridge with honey.

Beverages

Buckwheat is a plant that is an alternative to barley in brewing. Buckwheat beer is thus a gluten-free beer, as opposed to regular, "cereal" beer. Buckwheat does not contain gluten and belongs to pseudocereals. Buckwheat beer was invented not so long ago, but it can be said that it is a product with a future in the global market.

Buckwheat whiskey is an alcoholic drink produced in Brittany (France) and the USA. Buckwheat must be the basis of production.

Buckwheat shochu is a strong alcoholic drink that has been produced in Japan since the 16th century. Its taste is milder compared to traditional barley-based shochu.

memil ") is prepared from roasted buckwheat groats. cha " and "soba cha "). ^[12]

Use in cosmetology

Buckwheat flour is used as a natural ingredient in homemade cosmetics. In masks, peels and scrubs, buckwheat perfectly shows its cleansing, softening and nourishing properties.

- Scrub with buckwheat flour for dry skin

Mix one egg yolk, a teaspoon each of granulated sugar and olive oil and half a tablespoon of buckwheat flour. Bring to a homogeneous state and apply to cleansed face skin in a circular motion. Massage lightly. Do not rinse off face for 5 minutes. Then gently remove the scrub with a tissue and wash with cold water. After moisturizing the skin with cream.

- Pumpkin peeling with buckwheat flour for dry skin

Prepare a homogeneous composition of egg yolk, a tablespoon of grated pumpkin pulp, half a tablespoon of buckwheat flour and olive oil with granulated sugar (½ teaspoon each). Prepare your face (steam with a steam bath or a warm, damp towel). Then rub the pumpkin-buckwheat mixture into the skin for 2 minutes. Wash off the peeling with warm water.

- scrub with pepper and buckwheat flour

To prepare the scrub you will need: 100 g of ground coffee, 30 ml of hot pepper tincture, a teaspoon of ginger flour (powder) and a tablespoon of buckwheat flour. Mix everything thoroughly and keep the mixture in a dark place for 7 days. Scrub the pre-steamed skin of the body until redness. Then rinse with warm water and apply moisturizer.

Face masks based on buckwheat flour

- **Nourishing mask (for dry skin)**

Mix buckwheat flour (5 g) with cocoa powder and cosmetic coconut oil (10 g each). Apply to a cleansed face and hold for a quarter of an hour. Remove the mask with a damp soft towel or napkin.

- **Moisturizing mask**

Prepare a mixture of buckwheat flour (5 g), banana puree (take one medium-sized fruit) and 10 ml of heavy cream. Apply the mask on a washed face and hold for about half an hour. Remove the rest with a soft cloth.

- **Purifying mask**

Mix 10 g of buckwheat flour and liquid honey, add 2 drops of lemon essential oil to the mixture. Apply to the face with massaging movements. Wash off after 4-5 minutes with warm water.

- **Toning scrub mask**

Dilute 10 g of buckwheat flour in a small amount of warm water until the consistency of sour cream. Add to the mass 5 g of finely ground coffee and 5 ml of grape seed oil. Apply with gentle movements on the face, rubbing lightly. Wash off with warm water after 10 minutes.

- **Strengthening hair mask with buckwheat flour**

Required ingredients: 0.5 cups of milk, 2 tablespoons of buckwheat flour and one egg. Mix warm milk and flour and bring to a homogeneous state. Introduce the egg into the mixture. Apply evenly to hair. Leave the composition for half an hour, then rinse your hair well and wash with shampoo. ^[fourteen]

Other uses

- Buckwheat is a valuable honey plant, the flowers of which produce an impressive amount of pollen and nectar. Under conditions of sufficient moisture on one hectare of buckwheat, you can "collect" from 80 to 100 kg of honey. Buckwheat honey is useful, has a characteristic smell and pleasant taste.
- Buckwheat grain is an excellent animal feed for poultry. The inclusion of buckwheat grain in the diet of birds increases their egg production and improves the quality of meat.
- Buckwheat straw contains a lot of potassium, which makes it possible to obtain potassium carbonate (potash) from straw raw materials.
- Buckwheat husk is used in the production of plastics, in the microbiological industry in the production of fodder yeast; used as stuffing material for pillows and mattresses.
- Grinded buckwheat husk or ash from it is an excellent natural fertilizer for the land.
- The leaves and flowers of buckwheat are widely used in modern pharmacology for the synthesis of vitamin P. ^[3]

Dangerous properties of buckwheat and contraindications

Individual intolerance to buckwheat and buckwheat products can provoke significant allergic reactions.

The use of vitamin P is contraindicated in case of increased blood clotting.

Despite the undeniable dietary value, it should be borne in mind that steep buckwheat porridge contributes to the formation of constipation.

Buckwheat contains fluorescent phototoxic fagopyrins. Of course, buckwheat products are safe when consumed in moderation. But those on a diet based on buckwheat sprouts can develop fagopyrism (with excessive consumption of buckwheat sprouts, flowers, or extracts rich in fagopyrin). Symptoms of fagopyrism include inflammation of the skin in areas exposed to direct sunlight, sensitivity to cold, and tingling or numbness in the hands. [8,12]

Selection and storage

High-quality buckwheat is fresh, without the smell of mold or dampness. Buckwheat should be stored in a tightly closed jar in a cool place. If the conditions are violated or the shelf life is exceeded, the taste of cereals deteriorates. Not only the taste deteriorates, a musty and slightly rancid smell appears.

Story

The homeland of buckwheat is considered to be the highlands of India and Nepal, where it is believed that the plant was cultivated about 4000 years ago. Here, buckwheat grew in areas flooded in summer, abundantly flavored with sunlight, moisture and heat, which probably could not but affect the nature of its accelerated physiological development. From India, buckwheat entered China, Korea and Japan. In China, the first written sources mentioning the plant date back to the 5th century AD. From Central Asia and Tibet, buckwheat spreads to the Middle East and Europe, and then to North America. Among European peoples, the first written mention of buckwheat was recorded in the 16th century.

The first documented information about the cultivation of buckwheat in Russia dates back to the beginning of the 15th century. French traveler Guilbert Lannoa visits in 1414 and 1421. a number of Russian cities and in their reports mentions acquaintance with Russian cuisine and treats of buckwheat porridge. Documents from the 15th and 16th centuries testify to the wide distribution of this cereal crop in Russia (inventories of the Russian peasant household, act materials, monastic letters with instructions on the cultivation of buckwheat). In the 16th century, a separate trading row operated in Pskov, where only buckwheat was sold. Buckwheat grain was also supplied for sale in European countries. Buckwheat in the trade books of seaports is not inferior in terms of quantity to exported wheat. Smolensk buckwheat, brought from Russia, was appreciated at its true worth at the London International Exhibition and won prestigious awards.

According to most scientists, the theory of bringing buckwheat to Russia during the Mongol-Tatar invasions in the 13th century is considered unfounded. The conquering tribes did not grow grain or other crops, which was predetermined by their nomadic traditions. Italian diplomat Carpini Giovanni da Plano, who traveled through Mongolia in 1245-47. emphasized that the Mongols have neither bread nor its substitute culture. Two centuries later, the Venetian diplomat Contarini Ambrogio notes that the Mongols do not eat bread, eating meat and milk. A vessel with buckwheat seeds found in 1939 in a Sarmatian burial (in the Rostov region) also refutes the version of the "Mongolian trace", since the product belongs to the 2nd century BC. AD Subsequent similar finds dating back to the 10th and 12th centuries testify in favor of the fact that buckwheat was grown on Russian soil long before the Mongol-Tatar conquests. [3]

Varieties

The main task of breeders is to obtain varieties whose fruits would ripen more or less evenly and would be more firmly held on the plant. This is due to the peculiarities of buckwheat vegetation: it is characterized by non-simultaneous ripening of fruits. Branching, bud formation and flowering on each

particular plant continues, while the fruits formed in the place of the first flowers have already ripened and begin to gradually crumble.

The most common varieties of buckwheat:

- Buckwheat "Zelenotsvetkovaya" ("Malikovskaya"). In the process of selection, a thickened and strong peduncle was obtained - a property that allows ripened buckwheat fruits not to crumble for a long time.
- Buckwheat "Bashkir Krasnostebel'naya". The variety was bred by breeders based on several buckwheat hybrids. A variety has been created as a source of raw materials for the production of the Rutin medical preparation. ^[one]

Growing features

Buckwheat is better than other crops adapted to infertile soils. It grows well on soils, the acidity of which has pH = 5-7. The most favorable for growing buckwheat are loamy and sandy soils.

The features of buckwheat cultivation include: conditional and floating sowing dates; a short vegetation period (from 75 to 80 days), which is a guarantee of its ripening as a so-called insurance crop.

Buckwheat is moisture-loving. The plant absorbs water masses twice as much as wheat and three times more than millet. The yield indicators of buckwheat directly depend on precipitation, which falls at the stages of the beginning of plant growth, the period of flowering and the formation of the ovary: at this time, the need for watering in buckwheat is the highest. The soil for sowing buckwheat should be well-drained. After sowing, the soil is rolled and leveled. Exceeding the level of applied nitrogen fertilizers can reduce yields. Yield indicators directly depend on the number of pollinating bees.

Pest control should be of a preventive nature (treatment of seeds with fungicides, etc.): buckwheat seedlings can be affected by the fungus, the roots are eaten by the cockchafer, and the leaves and stems by the caterpillar of the wheat scoop. ^[four]

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Buckwheat - useful properties, composition and contraindications

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