

Cucumber (Cucumis sativus)

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

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

Beneficial features

100 g of fresh cucumbers with peel contains [10]:								
Main substances:	G	Minerals:	mg	Vitamins:	mg			
Water	95.23	Potassium	147	Vitamin C	2.8			
Carbohydrates	3.63	Phosphorus	24	Vitamin PP	0.098			
Sugar	1.67	Calcium	16	Vitamin B6	0.040			
Squirrels	0.65	Magnesium	13	Vitamin B2	0.033			
Alimentary fiber	0.5	Sodium	2	Vitamin E	0.03			
Fats	0.11	Iron	0.28	Vitamin B1	0.027			
calories	15kcal	Zinc	0.20	Vitamin K	0.016			
100 g of fresh cucumbers without peel contains [11]:								
Main substances:	G	Minerals:	mg	Vitamins:	mg			
Water	96.73	Potassium	136	Vitamin C	3.2			
Carbohydrates	2.16	Phosphorus	21	Vitamin B6	0.051			

Table 1. Chemical composition of cucumber (according to <u>Food+</u>).

Sugar	1.38	Calcium	fourteen	Vitamin PP	0.037		
Alimentary fiber	0.7	Magnesium	12	Vitamin B2	0.025		
Squirrels	0.59	Sodium	2	Vitamin B1	0.031		
Fats	0.16	Iron	0.22	Vitamin E	0.03		
calories	10kcal	Zinc	0.17	Vitamin B9	0.014		
100 g of pickled cucumbers contains [12]:							
Main substances:	G	Minerals:	mg	Vitamins:	mg		
Water	94.08	Sodium	1208	Vitamin C	one		
Carbohydrates	2.26	Potassium	23	Vitamin B2	0.010		
Sugar	1.06	Phosphorus	fourteen	Vitamin E	0.09		
Alimentary fiber	1.2	Magnesium	four	Vitamin K	0.047		
Squirrels	0.33	Iron	0.40	Vitamin B6	0.009		
Fats	0.20	Zinc	0.02	Vitamin B9	0.001		
calories	11kcal	Calcium	0	Vitamin A	0.01		

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

Medicinal properties

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

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

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

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

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

Use in medicine

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

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

• Decoctions and infusions

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

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

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

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

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

• Juice

Cucumber juice is considered a cleansing agent that helps dissolve toxic substances in the body. Also, traditional healers claim that it is effective in the fight against small kidney stones and uric acid

crystals. In addition, it is believed that it quenches thirst well, has a positive effect on the nervous system and strengthens memory.

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

in oriental medicine

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

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

In scientific research

Cucumber is very popular around the world, grows in a variety of climatic conditions, so it is not surprising that it becomes the object of scientific research. Basically, scientists are improving the existing methods of planting (terms and schemes), growing, harvesting and storing cucumbers. Breeders are engaged in the development of new, more disease-resistant varieties.

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

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

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

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

Weight regulation

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

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

In cooking

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

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

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

Combination with other products

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

Beverages

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

In cosmetology

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

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

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

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

Dangerous properties of cucumbers and contraindications

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

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

Story

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

Thanks to the increase in cultivation volumes and established trade relations, the cucumber went to conquer the world from India and China. That is how he got to Egypt, Ancient Greece, and much later to the Roman Empire. There is reason to believe that it was from the Greek name of this green vegetable " $\ddot{\alpha}\gamma$ oupoç " (goes back to " $\ddot{\alpha}\omega\rho$ oç " - unripe) that the word "cucumber" came from. By the way, the English name " cucumber " comes from the French word " concombre ", which, in turn, was borrowed from the Latin language (" cucumis ") ^[2].

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

they could be moved following the sunlight. It is believed that the first salting recipes appeared at the same time.

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

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

How to choose

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

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

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

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

How to store

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

Varieties

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

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

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

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

Growing features

Cucumber is a vine -like plant with a creeping stem that can reach two or more meters in length. Lateral shoots and tendrils depart from the main stem, with the help of which the plant can be fixed on supports, taking a vertical position. Thanks to this, it is possible to grow cucumbers on trellises (usually this method is used in greenhouses and on balconies), although if space in the garden / bed allows, then the stem is allowed to spread along the ground. The length and degree of branching depends on the variety ^[5].

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

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

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

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

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

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

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An extended HTML version of the article is available on the website edaplus.info.

Cucumber - useful properties, composition and contraindications

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