

## Melon (lat. Cucumis melo)

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

Keywords: melon, benefit, harm, beneficial properties, contraindications

# **Beneficial features**

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

Main substances (g / 100 g):	Fresh honey [1]
Water	89.82
Carbohydrates	9.09
Sugar	8.12
Alimentary fiber	0.8
Squirrels	0.54
Fats	0.14
Calories (kcal)	36
Minerals (mg/100 g):	
Potassium	228
Sodium	eighteen
Phosphorus	eleven
Magnesium	ten
Calcium	6
Iron	0.17
Zinc	0.09
Copper	0.024

Vitamins (mg/100 g):	
Vitamin C	eighteen
Vitamin PP	0.418
Vitamin B6	0.088
Vitamin B1	0.038
Vitamin E	0.02
Vitamin B2	0.012

The above table for honey melon shows that its pulp contains a wide range of vitamins and minerals, but almost all of them are presented in a relatively small amount in relation to the recommended daily requirement - % RDP / 100 g. (For another popular plant variety - cantaloupe melon - figures may differ slightly).

In the list of minerals, the potassium content is most noticeable (about 10% RSP). But the iron, for which the melon is often praised, in the pulp, as a rule, is only 0.17-0.21 mg / 100 g, which corresponds to about 1.5-2% RSP (although in some varieties this percentage can reach 7% RSP). There are quite a lot of vitamins C in the fruits (20-40% RSP), there are also vitamins B1, B6, B9, PP (about 4% RSP). Melon is also distinguished by the content of beta-carotene (provitamin vitamin A) - up to 40% RSP. A number of essential amino acids were also found in melon pulp: valine, histidine, leucine, lysine, isoleucine, etc. (1-2% RSP).

#### **Medicinal properties**

Despite the fact that the medicinal properties of various parts of the melon have been known since ancient times, modern science is also interested in them, rechecking the statements of ancient doctors.

So, for example, there are several works at once, in which the antitumor effects of the properties of the peel of fruits, seeds <sup>[2]</sup> and melon stems are proved. A triterpenoid compound isolated from the stems of the plant (cucurbitacin B) has been tried in China for some time in the treatment of hepatitis and hepatoma (hepatocellular cancer), and new work with cucurbitacin B confirms its therapeutic efficacy. <sup>[3]</sup>

Due to their antioxidant properties, melon extracts also show an anti-hemolytic effect, that is, their administration can stop the premature breakdown of red blood cells. <sup>[4]</sup> It is found that melon pulp, when consumed regularly, has an anti-atherosclerotic effect on blood vessels. A number of studies have documented the ability of melon extracts to prevent abnormal increases in blood glucose levels, as well as the levels of lipoproteins and lipids. Together, this makes it possible to use extracts of parts of the plant to alleviate the condition of patients with cardiovascular diseases and type 2 diabetes.

## Diabetes

Diabetes mellitus is usually a contraindication to melon dietary intake due to the sugars in the fruit, but animal experiments have shown that oral administration of melon to obese mice results in improved inflammatory status associated with altered gut microbiota and then improved glycemic control. And this has the potential to prevent the development of insulin resistance in type 2 diabetes. <sup>[5]</sup>

Another study showed that taking melon-based products (especially with date preparations) had a hypoglycemic effect, attenuating primary heart muscle pathologies in diabetic rats.

Melon leaf extract is also likely to have the potential to prevent damage to the nervous system and inhibit the growth of cognitive impairment in animals with diabetes mellitus (more on this and previous research, see below).

Cardiovascular pathologies.

As far back as the end of the last century, studies have shown that an aqueous melon extract is able to inhibit platelet aggregation, thereby potentially preventing the formation of blood clots in the vessels. <sup>[6]</sup> More recent experiments in rats have shown that consumption of melon concentrate may have therapeutic benefits in preventing myocardial hypertrophy and inhibiting cardiac fibrosis. <sup>[7]</sup>

Due to its diuretic properties, melon can be considered as a herbal remedy for high blood pressure. In one synthesis study, melon extract was named as one of the most promising concentrates for the development of natural drugs with a diuretic effect. [eight]

Published data suggest that melon consumption has a sedative effect on the central nervous system, melon peel extracts can stimulate thyroid function [9], and a combination preparation with pulp extract when applied externally can provide safe repigmentation in people with vitiligo. Sometimes melon is included in the complex diet of patients with anemia, hemorrhoids.

# Use in medicine

Today on the market there are a number of preparations with melon extract, belonging to the group of nutritional supplements. Manufacturers of dietary supplements position their products primarily as antidiabetic agents that help maintain normal blood sugar levels by ensuring proper glucose metabolism. Additional therapeutic effects include lowering blood pressure and an antioxidant effect. Such preparations are most often made from wild bitter melon (Wild Bitter Melon), but cantaloupe melon fruit extracts are also found.

#### In folk medicine

Ancient folk medicine (on the postulates of which the first systematized medical theories and practices were based) attributed melon to products that, with regular use, can cleanse internal organs, nourish the body and saturate the brain with moisture. Thanks to these properties, melon pulp treated jaundice and dropsy, provoked menstruation with a delay, increased the amount of milk in lactating women, relieved edema and restored kidney function.

Folk "herbalists" prescribed to eat melon pulp to improve mood (as an antidepressant), for stomach problems, scurvy, tuberculosis, hemorrhoids, rheumatism, gout.

The people have traditionally distinguished the medical effects of weed field and varietal sweet and unsweetened melons. Weed field melon was used to get rid of a very wide range of diseases and pathologies:

- To get rid of epileptic seizures, paralytic spasms (including on the face), tetanus and headaches. With migraines, to relieve attacks, melon juice thickened in the sun was mixed with the milk of nurses and injected into the nose of the patient. In the treatment of epilepsy, the thickened juice of a field melon mixed with milk was also used, however, before the introduction of the mixture, the body had to be cleansed first. A mixture of milk with leaf juice or just the leaves of the plant was considered more effective. Often, milk was replaced (or supplemented) with ammonia.
- For excretion of bile (with feces), urine and uric acids (in gout treatment programs). Cholagogue and diuretic effects were achieved by drinking fruit juice (about 1 gram per dose). But by increasing the dose of juice to 3 grams for three days, it was possible to achieve the excretion of bile already through vomiting.

• For the treatment of colds and eliminate their symptoms. Ancient folk healers believed that drunk fruit juice in its pure form would ease labored breathing. And if you mix it with olive oil and anoint your neck or palate with this mixture, it will help get rid of a sore throat.

From unsweetened melons, poultices were prepared for inflammation of the eyes. And its dried and powdered pulp, mixed with wheat flour, removed freckles, age spots and various skin pathologies. However, in addition to the pulp, melon peels, seeds, flowers, leaves, stems and roots have long been used in folk medicine.

- **Corky.** Folk healers used to lubricate the body with melon peels to provoke urination, and the head to eliminate inflammation in meningitis. Eating 5-7 grams of crushed crusts was used to remove bladder and kidney stones. And to activate the movement of feces, it was recommended to eat about 5-6 grams of the peel of field melon fruits daily, washing down the healing agent with honey water.
- **flowers.** The dried flowers of the plant were ground into powder, which was then sprinkled with lichen. To eliminate various skin diseases, warts, spots, itching, honey, wine or vinegar was added to the powder of flowers. Sometimes flower powder fought with joint pain.
- **Seeds.** In traditional medicine, it was believed that melon seeds (and juices of crushed seeds) in a dose of 7 to 17 grams increase male potency, add milk to lactating women, open the channels of the kidneys, liver, and bladder. Seed milk relieved inflammation, treated eye diseases and removed freckles. They were eaten raw to relieve fever and relieve coughs and thirst.
- **Leaves.** A decoction of melon leaves was drunk to treat leprosy (leprosy) a disease caused by mycobacterium (Mycobacterium leprae).
- Roots. Melon root is considered a strong emetic, but it is used not only in this capacity.
  For the treatment of dropsy, 150 grams of crushed plant roots were infused with 1 liter of wine for a week. With a therapeutic effect, the drug should be used three times a day, 100 ml each. For external use in dropsy, melon roots were first boiled in water, ground and, mixed with wine, added to the dough, which was applied to the accumulation of transudate. The juice of the plant roots was used to get rid of helminths. To do this, it was slightly warmed up and applied to the navel. Lubricating the testicles with juice should have led to a decrease in pain and swelling of the glands. The same condensed juice of the roots activated menstruation. However, its introduction directly into the vagina of a pregnant woman could provoke a miscarriage. A compress of boiled roots mixed with barley flour contributed to the faster maturation of inflammation on mucous surfaces. Enemas from a decoction of the roots (up to 3.5 grams of concentrate) were put by traditional healers for treatment radiculitis. External compresses soaked in root decoction and vinegar were treated for gout and joint pain.

### in oriental medicine

In Chinese dietology, melon refers to foods that have an average concentration of Yin. As a cold product, it quenches thirst and relieves the heat of inflammation. Melon is used in case of lack of appetite, discomfort in the chest area, with problems with the excretion of urine and toxins.

Abuse of melon can provoke acute diarrhea. But, in addition, it drains the Yang energy and can create an internal accumulation of cold.

In traditional Indian medicine, melon fruits have been used to treat diabetes, liver disease, heart disease, and obesity.

#### In scientific research

Melon has not yet become a popular object of scientific research, especially the part that is associated with a therapeutic effect on the human body. However, from time to time this melon culture still falls into the field of view of scientists.

Melon extract as part of a complex preparation has shown effectiveness in the treatment of vitiligo. [ten]

In this study, scientists wanted to evaluate the effectiveness of topical application of a new gel composition containing melon extract, phenylalanine and acetylcysteine in vitiligo (pigmentation disorders due to the lack of melanin in some areas of the skin). The safety of the drug was also checked (including when using 0.05% ointment with clobetasol).

Scientists examined 149 patients suffering from symmetrical vitiligo affecting less than 10% of the skin surface. (Patients affected only by the vital coil were excluded from the analysis). The duration of treatment was 12 weeks, after which excellent repigmentation (> 75%) was achieved in 38-73% of patients, depending on the treatment regimen. Minor to moderate side effects were observed only in patients using an additional 0.05% clobetasol ointment. When used alone, the tested gel composition showed good efficacy in improving the repigmentation of vitiligo, and no side effects were recorded.

Melon leaf extract reduces the degree of damage to the nervous system and cognitive impairment in animals with streptozotocin-induced diabetes. [eleven]

Since the central nervous system is considered one of the most vulnerable targets of oxidative stress in diabetes, scientists are looking at ways to provide antioxidant protection to the brain through healthy foods and herbal supplements, such as melon leaf extract.

In the experiment, adult male albino rats were divided into 5 groups of 6 rats each. In 4 groups, diabetes was induced by a single intraperitoneal injection of streptozotocin (STZ; 60 mg/kg body weight), and the 5th group was the control group.

One of the four diabetic groups was left untreated and considered the diabetic control group, while the other three groups were treated with melon leaf extract at doses of 30, 60, and 120 mg/kg bw for 30 days.

After completion of the experiment, plasma and brain were used to assess biochemical changes. The data obtained showed that treatment with melon leaf extract reduced blood glucose, glycated hemoglobin, brain tumor necrosis factor, interleukin levels, brain malondialdehyde content, and caspase-3 activity. In addition, the treatment resulted in marked increases in plasma levels of dopamine, melatonin, brain endothelial growth factor A, brain catalase, and superoxide dismutase.

Based on their findings, the researchers concluded that melon leaf extract has a neuroprotective effect against oxidative damage associated with diabetes.

Melon serpentine has a preventive effect against the development of cardiomyopathy in diabetic rats. [12]

Cardiomyopathies are pathologies that affect the middle layer of the muscle fibers of the heart. One of the causes of such pathologies can be endocrine diseases and in particular diabetes mellitus.

In this study, scientists tested the ability of aqueous extracts of serpentine melon (Cucumis melo var. Flexuosus) and date fruits to suppress type 2 diabetes-induced cardiomyopathy in laboratory rats.

Plant extracts (together and separately) at the rate of 200 mg/kg of body weight in diabetic rats were taken daily for a month. The results showed that both individual agents and combinations significantly reduced glucose levels and increased blood insulin concentrations. Plant extracts significantly reduced serum inflammatory molecules, tumor necrosis factor (TNF- $\alpha$ ) and C-reactive protein (CRP), as well as changes in cardiac malondialdehyde (MDA) and glutathione peroxidase (GPx). In addition, the extracts attenuated an increase in the cardiac apoptosis enzyme (caspase-3) and oxidative DNA fragmentation. Treatment of diabetic rats with herbal extracts also reduced the levels of the serum cardiac function enzyme, creatine phosphokinase-MB (CPK-MB).

This study proved that both herbal extracts and especially their combination have a potential hypoglycemic effect and can attenuate cardiomyopathy in diabetic rats.

## Weight regulation

Due to the rather high content of fast carbohydrates - sugars (about 8-9 g per 100 g of product), melon is not considered a dietary product. But melon methanol extracts (500mg/kg) in some animal studies on high cholesterol diets have shown the ability to slow weight gain, lower low-density ("bad") cholesterol while increasing high-density cholesterol ("good") in serum as early as 28 days after the start of treatment. [13]

Often, a 1-3 day mono-diet is built on the basis of melon. Usually unsweetened fruits are chosen for her and 1-1.5 kg of pulp per day is divided into 5-6 meals. Drinking melon is not recommended, but in between meals, those who have experienced a diet are advised to drink a cup of herbal tea.

### In cooking

Most often, the melon is eaten fresh, chilled, removing the inedible peel and cutting the flesh into slices of a cubic or spherical shape. Before cooking, for stability, the "poles" of the fruit are usually cut off. But the order of cutting off the remaining crust depends on what exactly the cook intends to do: for example, it is more convenient to make melon balls without pre-peeling, and fruit and vegetable salads and dishes after removing the peel.

The peeled skin is also not always thrown away, as it can be an excellent softener for tough meat. When cooking dishes, the peel is thrown directly into the pan in which the meat is cooked. And when preparing raw materials for barbecue, with the addition of a peel, it will be possible to marinate the meat of even old animals well.

Despite the widespread opinion among the people that it is better to eat melon separately from other products to maintain normal digestion, the culinary traditions of the peoples of the world are not so unambiguous on this score. For example, in England it is customary to serve melon for breakfast, in the USA - at the beginning of lunch to eat it with "dense" dishes, and in Central Asia, meat and fish are traditionally cooked with melon. The combination of ham with fruit pulp has become a classic today in many cuisines of the world. And the melon taste goes very well with the taste of seafood, various herbs, spices, berries.

Depending on the type and variety, the culinary purpose of melons may vary: "Galia", "Kassaba", "Kreshno" are good for desserts or snacks, winter melons are more appropriate in soups and seafood dishes, "Bukharka" with its pear-like shade can become a fragrant basis for homemade wine. (By the way, although delicious alcoholic drinks are made from the melon pulp, it is believed that preparing wine from grapes should not be placed next to fragrant fruits - the melon smell will spoil it).

## In cosmetology

In cosmetology, melon extracts are used to even out skin tone, protect against the sun, moisturize and relieve inflammation, as well as to normalize the production of sebum. Celebrity supermodel Cindy Crawford uses the Charente melon, native to the south of France, as one of the main ingredients in her "Meaningful Beauty" cosmetic line. Cosmetics of this line are intended for mature women who are interested in the antioxidant properties of melon products and the restoration of skin elasticity.

But not only Cindy Crawford includes melon extracts in her products. Leading cosmetic companies in Europe, Asia and America use similar ingredients in creams, serums, eau de toilette, shampoos and soaps. Moreover, the use of melon components in hair care is not an invention of recent years. Residents of the highlands of Tajikistan have been using fruit seeds for a long time as a shampoo that softens hair and removes dandruff.

In modern home cosmetology, melon pulp is mainly used, including it in complex masks:

- with lemon to lighten age spots,
- with honey, sour cream and egg yolk to increase tone and smooth fine wrinkles,
- with milk and mineral water for moisturizing, although often for this purpose the face is simply wiped with ground and squeezed pulp collected in a gauze bundle.

# Dangerous properties of melon and contraindications

Melon is contraindicated in people with peptic ulcers of the gastrointestinal tract, patients with gastritis, intestinal disorders. The abundance of sugars in fruits requires special control over the diet of people with diabetes.

There are a number of restrictions on the compatibility of melon with other products. Melon should not be washed down with milk, kefir, fermented baked milk, alcoholic beverages and even water.

Due to the potential development of pathologies of the digestive system in a child on breastfeeding, melon is recommended to be carefully introduced into the diet of nursing mothers.

It is dangerous to eat fruits with a damaged peel, because pathogens can easily penetrate into the pulp through it.

Nitrates easily accumulate in the melon (especially in the layer near the peel), so if you suspect a high concentration of chemistry, you should either refuse to eat or eat the pulp closer to the center.

Men, seeking to normalize erectile function, often abuse melon seeds, eating more than 5 grams per day. It is believed that this can lead to problems with the spleen.

## **Selection and storage**

Today on the shelves you can find many different varieties of melons, differing in color, size, shape. But there are several universal indicators of product ripeness:

- **Smell.** A ripe melon should have a strong aroma.
- **Fetal weight.** A ripe melon will be heavier than it looks. In addition, it can be compared with the weight of other fruits of the same size and variety and choose the heaviest.
- **Elasticity.** A very hard crust is a sign of an immature fruit. In a ripe melon, when pressed with a finger, the peel will be slightly crushed.
- **Sound.** When tapping the sides of the melon with the palm of your hand, it should make a hollow sound.

The general rules for the storage of melons involve the preliminary selection of fruits without damage to the peel and initial signs of decay.

Uzbek experience shows that, in general, melons are best kept hanging in a ventilated wicker net so that the fruits do not touch each other. But if there is no suitable beam for this, melons can be placed in boxes on soft sawdust at a small distance from each other. The desired effect will help to achieve and shifting the fruit with paper or cloth. From time to time (about once every 3-4 weeks) they need to be checked and fruits should be discarded, on the peel of which dark spots began to appear.

Melons are perfectly stored in dark rooms with a fairly low temperature (1-3 ° C) at a relative humidity of 70-80%. But even under ideal conditions, late-ripening varieties will be better stored: Khabalon, Zimovka, Chiano, etc. Some fruits can lie for up to six months, but melons should not be placed next to apples or potatoes, which accelerate ripening. Without special temperature conditions, an uncut melon will retain its freshness for at least a week if it is not placed in direct sunlight.

Frozen melon cut into pieces can also be stored for a very long time (until the next harvest). After defrosting, the pulp changes its physical properties, while maintaining aroma and taste. But if the cut melon is not frozen, then even in the refrigerator it should not be kept for more than a week. In this case, it is better to cover the slices with cling film to prevent drying.

If there is no space in the refrigerator, the melon can be dried and wilted. Often unsuccessfully selected unripe or dryish fruits are dried. Firstly, they do not have to be thrown away, and, secondly, they will cook faster than juicy ones. To do this, the pulp is cut into long slices 1-3 cm thick, getting rid of the green layer near the peel, laid out on a wire rack or baking sheet covered with parchment, and then either placed in the oven to speed up the process, or kept for about 2 weeks in air for natural wilting.

In the first case, the temperature in the oven should be around 70-75°C, taking into account the slightly ajar door for the release of vapors. Cooking time - up to 8 hours. If the slices are not placed on the grate, but on a baking sheet, then it is better to change the baking paper regularly (in the first hours it will get wet very quickly). In the case of natural air drying, cut slices should be covered with cheesecloth to protect against insects and gently turned every 2 days during the entire 2 weeks of cooking.

The resulting dried strips are stored in a closed jar (glass, plastic, wooden). To make the slices less sticky, they are rolled in sesame seeds, coconut flakes, poppy seeds, or lightly sprinkled with watermelon juice. Sometimes they are folded into pigtails or rolls.

#### Varieties and cultivation

The melon loves light and heat, tolerates saline soil and drought, and almost does not tolerate high humidity. And although in the Russian Empire in the 17th century they successfully tried to grow it in greenhouse conditions even in the suburbs, it still grows better in the dry Asian climate on open melons.

There are many varieties and varieties of melons, among which there are quite exotic representatives. All of them belong to the genus Cucumber of the Pumpkin family, so it is not surprising that the word "cucumber" is found in the alternative names of some of them, and the melon fruits themselves are usually called "pumpkins".

• **Serpentine melon, or Armenian cucumber.** It has very elongated fruits, the longest specimens of which grow more than a meter, although the average length is about 50 cm. It is

- harvested at a young age, but if the pumpkin is allowed to ripen, it acquires a characteristic melon aroma.
- **Horned melon Kiwano, or African cucumber.** Outwardly, the fruits are similar to the usual melon in color and size, but differ in growths-thorns. The flesh of the kiwano is generally more like a green jelly with numerous seeds of a pale green color.
- **Tiger Melon, or Pomegranate, or Fragrant, or Queen Anne's Pocket.** In all these cases, we are talking about Queen Anne's Pocket pumpkins. Their stripes on the skin really resemble a brindle color, and the size (up to 8 cm in diameter) is so small that they can fit in a pocket. It is believed that the ladies of the Victorian era actually put melons in the pockets of their dresses for the strong pleasant aroma.

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

# Melon - useful properties, composition and contraindications

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