

Journal of Healthy Nutrition and Dietetics



In issue:



Lentils



Turmeric

- Food against inflammation
- Blood thinning food
- Food for detoxification of the body
- Food to increase hemoglobin
- Food for lowering blood sugar
- Food to increase the level of leukocytes
- Food to increase testosterone levels
- Food for protection against cancer and the fight against oncology

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Lentils (lat. *Lens culinaris*)

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

Key words: lentils , benefits, harm, beneficial properties, contraindications

Beneficial features

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

Main substances (g / 100 g):	Raw red lentils contains
Water	7.82 g
Carbohydrates	63.1 g
Squirrels	23.91 g
Fats	2.17 g
Calories (kcal)	358 kcal
Minerals	mg/100 g:
Potassium	668
Phosphorus	294
Magnesium	59
Calcium	48
Iron	7.39
vitamins	mg/100 g:
Vitamin B3	1.5
Vitamin B1	0.51
Vitamin B 6	0.4
Vitamin B5	0.35

Vitamin B2	0.11
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On the shelves of stores today, lentils are represented by a whole color palette. Depending on the variety, composition of the seed coat and cotyledons, lentils can be yellow, orange, red, green, brown or black.

The color of the shelled seeds is mainly related to the color of the cotyledons. Such lentils are yellow, red or green. The color of whole (unshelled) seeds varies from green and gray to brown and black. Since the seed coat contains a range of biologically active substances, the chemical composition of the same shelled and whole lentils will differ. Also, to a certain extent, the chemical composition of lentils of different varieties or grains grown under different conditions differs.

In the presented table, we have provided data for raw red lentils, since they are cooked more often in the kitchens of our country. It is not as coarse as whole lentils, it is easier to digest and assimilate, although unshelled lentils are a little more useful in some respects.

Whole lentils (as a percentage of the same mass of seeds) have more fiber, potassium, calcium, iron, phosphorus, and usually slightly more vitamins B6 and B2. At the same time, whole lentils contain fewer carbohydrates and calories. But in general, calorie values do not differ so much to change the culinary strategy for this.

However, lentils with green and gray shells contain higher amounts of flavan-3-ols (catechins), proanthocyanidins and some flavonols, which largely determines the potential of lentil seeds in a healthy diet.

Regardless of the presence or absence of the shell, lentils are products rich in vegetable proteins, among which globulin (more than 45% of the total amount of seed proteins) and albumin are distinguished. Among two dozen leguminous crops, lentils are in the “top 3” in terms of the percentage of starch (more than 47%), insoluble dietary fiber, and phenols, ahead of green peas, chickpeas and mung beans (mung beans) in the latter indicator. ^[2]

The seeds of this crop are considered a good source of prebiotics - they are found in prebiotic carbohydrates (12-14 g / 100 g of dry lentils), which help maintain the intestinal microbial environment and prevent gastrointestinal diseases.

In addition, lentils are relatively low in fat and sodium, but high in potassium (sodium to potassium ratio is approximately 1:30). ^[3] This makes lentils an excellent dietary option for obese and cardiovascular patients. Also safe for patients with cardiovascular diseases using anticoagulants in the treatment, makes lentils low content of phyloquinone - vitamin K (5 mcg / 100 g with a daily requirement in adults of about 80 mcg).

Among other vitamins, thiamine (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxine (B6), folic acid (B9), α , β and γ tocopherols (E) were found in lentils. Minerals include zinc, copper, manganese, molybdenum, selenium and boron.

Medicinal properties

Ancient doctors believed that regular eating of lentils helps a person get rid of nervous disorders, become more calm. But already in the early Middle Ages, the famous Persian physician Avicenna, in fact, refuted the opinion of ancient Roman colleagues. He claimed that lentils can cause nightmares, which in turn lead to the appearance of circles under the eyes. In addition, he attributed to lentils the ability, by thickening the blood, to effectively stop bleeding and lower blood pressure.

Modern research data show other medicinal properties of lentils. According to them, the consumption of seeds of this legume is directly associated with a reduced risk of diabetes, cardiovascular disease, and cancer.

Of course, lentils should not be considered as a substitute for medicines. But as an adjunct, it can help in the treatment of these and other diseases, showing antioxidant, antibacterial, antifungal, antiviral, cardioprotective, anti-inflammatory, nephroprotective, antidiabetic, antitumor properties.

Antidiabetic activity of lentils

According to scientists, regular consumption of sprouted lentils is beneficial for the prevention and treatment of diabetes. ^[4] The seeds of this legume have the ability to improve the metabolism of glucose, lipids, and lipoproteins in the blood of overweight and obese type 2 diabetics. ^[5]

Animal studies have shown that the flavonoids and fiber in lentils play a significant role in intestinal motility and prevent impaired metabolic control in diabetic rats. It is too early to transfer the data to humans, but the scientists themselves call these results promising in terms of the use of lentil flavonoids in the treatment of patients with diabetes.

In human studies, some research projects have shown how regular consumption of boiled lentils (50 g) among patients with diabetes resulted in a significant decrease in fasting blood sugar levels.

The decrease in the glycemic index in the lentil diet is associated with the presence of polyphenols in the seeds, which affect metabolic disorders. In addition, in vitro (test tube) and in vivo (living organisms) studies have also demonstrated that lentils in the diet regulate starch digestibility, glycemic load and glycemic index, which reduces the complications of diabetes.

Cardioprotective effect of lentils

The use of phenol-rich lentil seeds reduces the risk of cardiovascular disease. Lentil polyphenols lower blood pressure and generally prevent the development of hypertension and coronary artery disease.

In experiments conducted on animals with hypertension, the administration of lentils significantly reduced total cholesterol, triglycerides, and low-density lipoprotein ("bad" cholesterol). In another study, lentils significantly increased high-density lipoprotein ("good" cholesterol) levels and lowered blood glucose levels in diabetic rats.

Antimicrobial activity of lentils

Containing flavonoids and lectins, lentils are non-toxic and safe for use in medical diagnostic kits. A biologically active "protective" peptide isolated from germinated lentil seeds exhibits antibacterial and antifungal activity (in particular, it inhibits the growth of *Aspergillus niger*).

These immune system peptides (defensins) are likely able to interrupt the viral digestive enzymes, ultimately preventing viral replication. In addition, defensins block ion channels and inhibit protein translation. Therefore, the "protective" peptides of lentil seeds, together with phenolic compounds, act as a potential inhibitor of microbial growth.

Anti-cancer potential of lentils

Some research suggests that eating lentil seeds may reduce the incidence of a variety of cancers, including colon, thyroid, liver, breast, and prostate cancers.

A large prospective epidemiological study involving 9.6 thousand women, which, among other products, "tested" polyphenol-rich lentils, revealed an inverse relationship between the use of this legume product and the risk of breast cancer. ^[6] That is, in those populations where it was customary to eat lentils, the number of cases of breast cancer was lower.

First, lentil seed polyphenols are hypothesized to absorb carcinogens, provide detoxification, and contribute to the accuracy of DNA repair. And, secondly, lentil lectins, together with phenolic compounds, have also proven themselves as therapeutic agents. They have shown the ability to bind to the membranes and receptors of cancer cells, inhibiting protein synthesis, causing cancer cell death. ^[7]

At least in rat experiments, lentil seeds have already demonstrated chemopreventive potential for colorectal carcinogenesis and significantly reduced neoplasms in the rat colon. ^[8] It is believed that flavones, flavonols, anthocyanidins, tannins and other biologically active compounds are responsible for the effectiveness of such chemoprophylaxis, which are significantly more in lentils than, for example, in green and yellow peas.

Finally, a number of test-tube studies have shown that lentils also have a higher total antioxidant capacity than chickpeas, beans, or soybeans. Lentil extracts have been shown to scavenge oxygen radicals with an efficiency equivalent to the antioxidant capacity of Trolox (Hoffman-LaRoche's water-soluble vitamin E analogue). Also, according to this indicator, lentils surpassed the simultaneously tested onions, horseradish, potatoes, wheat germ, blueberries, and cherries.

At the same time, despite a wide range of potential medicinal properties, lentils are still not used in medicine, and they remember it mainly when it is necessary to increase the amount of easily digestible vegetable protein in the diet due to nutrition.

In folk medicine

In folk medicine, lentils are used both alone and in combination with other "green pharmacy drugs". In both cases, lentils are usually taken in the form of decoctions or infusions, although there are also recipes with crushed seeds.

In ancient herbalists, lentil infusion is mentioned as a remedy for smallpox. In modern collections of traditional medicine, lentil preparations correct the work of the gastrointestinal tract, kidneys, liver, accelerate wound healing, treat eye diseases (external compresses).

- For the treatment of urolithiasis, lentil seeds (1 tablespoon) are poured with water (350 ml) and boiled for about 30 minutes. The liquid is not drained, but drunk three times a day, 50 ml each.
- To get rid of constipation, a liquid decoction of lentils is prepared, often reinforcing its action with the addition of prunes. To get rid of diarrhea - on the contrary - they use thick lentil porridge boiled in vinegar.
- Gargling with a decoction of lentils eliminates perspiration, cough and inflammation of the oral mucosa.
- Puffy eyes are relieved with a mixture based on rose oil, prepared from lentil seed powder mixed with sweet clover.
- A compress of lentil flour mixed with cabbage juice is applied to the site of inflammation of the mammary gland.
- Deep wounds on the body, in the absence of antiseptics, are recommended to be covered with lentil flour mixed with honey. And small cracks, redness and rashes - with lentil flour mixed with egg white. Against skin rashes in folk medicine, compresses are made from lentils cooked with peel and juice of unripe grapes or vinegar.

Also, in modern folk medicine, pregnant women are advised to increase the consumption of lentils, explaining this by the abundance of folic acid, which is necessary for the normal development of the fetus.

Another practice is to strengthen the gums and teeth with the help of lentil infusion, which is used to rinse the mouth.

in oriental medicine

A detailed description of the properties of lentils was given by the recognized classic of medieval Persian medicine, Ibn Sina (Avicenna). According to his ideas, lentils are a product that requires moderation, a food that can be eaten in far from any combination. So, lentils will not harm if you eat them with fatty meat, almonds, vinegar. But in combination with salted fish, sugar and other sweet ingredients, lentils can provoke an exacerbation of hemorrhoids, cause dropsy, worsen urination. Abuse of lentils can cause melancholy, lead to visual impairment, and even create prerequisites for contracting leprosy.

Representatives of modern Tibetan medicine also consider the combination of lentils with some sweet foods, especially brown sugar, to be harmful.

In traditional Chinese medicine, lentils are responsible for the circulation channels of Qi energy, correlated with the stomach and spleen, on which lentils have a healing effect. Grains of the plant are recommended to be eaten to get rid of edema and stop diarrhea, as well as to be more actively introduced into the diet with a lack of Yin energy.

As a prophylactic, lentils are eaten to reduce the risk of cancer and to prevent the appearance of helminths.

In scientific research

We have already mentioned the numerous scientific studies of lentils, which studied the role of this legume in improving the condition of diabetics, as well as the cardioprotective, anti-cancer, antimicrobial potential of seeds. But in this section, we want to talk more about how these studies are conducted, using the example of a scientific work that evaluated the chemoprophylactic effect of exposure to raw and cooked lentils on colorectal cancer foci.^[9]

To explore the hypothesis that the grains of this legume in the diet can suppress early carcinogenesis and that culinary heat treatment can affect the chemopreventive potential of the product, 4 types of lentils were used: raw whole, raw peeled, boiled whole and boiled peeled. In addition, previously well-studied soybeans participated in the comparison.

Sixty male rat pups aged 4 to 5 weeks were randomly divided into 6 groups (10 animals per group). After acclimatization for 1 week (at the age of 5 to 6 weeks), all animals were transferred to the control and treatment diet for 5 weeks. At the end of the 5th week of feeding, all rats received 2 subcutaneous injections of the carcinogen at a rate of 15 mg/kg of rat body weight per dose once a week for 2 consecutive weeks. All animals were euthanized 17 weeks after the last injection and their colonic condition was analyzed for multiple parameters.

Based on their analysis, the researchers concluded that lentil consumption may protect against colon carcinogenesis and that hydrothermal treatment even improved the chemopreventive potential of whole lentils.

Weight regulation

The calorie content of whole green and brown lentils is estimated at about 300 kcal / 100 g of dry product. In boiled form, after increasing the moisture content by 6-7 times, the calorie content of 100 grams of boiled lentils will be about 100-105 kcal/100 g. For dry peeled red lentils, these figures are 315-320 kcal/100 g before cooking and 100 kcal/100 d - after boiling. That is, lentils in dishes are not a very high-calorie product, and by this alone it attracts the attention of people who want to lose weight.

The grains of the plant also contain several antinutrients that are thought to play a role in energy regulation. The seeds of this crop are rich in fiber, have a relatively low energy density (about 1.3 kcal/g or 5.3 kJ/g), and are considered a good source of digestible protein. The carbohydrates in lentils are digested slowly, providing long-lasting satiety, and exhibit one of the lowest glycemic index values among carbohydrate-containing foods. According to the Harvard Medical School, the glycemic index of lentils is 32 ± 5 .^[10]

In favor of the fact that lentils can be used in the fight against obesity, there are also some human studies^[11], in which the effect of lentils was compared with the effects of other legumes (chickpeas, purple beans, yellow peas). In experiments, lentils showed the strongest satiating properties and, in general, helped to reduce the amount of food consumed. And although the percentage of this decrease was relatively low - only 8% - it still helped to reduce body weight and waist circumference, although not radically.

Indirectly, animal experiments also speak about the benefits of lentils in the fight against extra pounds. In particular, the lentil diet has been found to affect the gut microbiome and markers of obesity in animals, reducing animal body weight and body fat percentage.^[12]

But, despite this, data on the effect of lentils directly on body weight and waist circumference remain controversial. Sometimes these beans are credited with effects that can be explained not by the lentil specificity of the diet, but by the general lifestyle and nutrition. In addition, all human studies conducted have included only participants who were initially overweight or obese, so normal weight people who want to lose a few more pounds with lentils may not achieve the desired result.

At the same time, lentils can be considered as a product that helps to control existing body weight, fill up faster and make longer intervals between meals.

In cooking

Judging by the biblical texts, the birthright was once obtained for lentil stew, and brother was ready to quarrel with brother. And although in this case, we are not talking so much about the taste of the stew, but about the symbol of food as such, this only emphasizes the fact that there were times when lentils were highly valued and occupied a central place on the dining table, often replacing other dishes.

Today, lentil soup and mashed potatoes are prepared from it, lentils are served with meat, fish and vegetables, steamed in the oven and boiled in a slow cooker. In Spanish and Italian cuisines, where seeds are preferred to be eaten whole, large-grain beans are more common (for example, varieties of white Provencal, Heller lentils). And in the eastern culinary tradition, not only are small-grain varieties willingly prepared, but they are often ground into flour even at the stage of preparing the dish.

Despite the variety of culinary approaches, it is believed that lentils are easy to prepare, and almost anyone can make a delicious and nutritious dinner based on them. It is only necessary to take into

account that whole seeds with a shell require pre-soaking and take longer to cook, while peeled grains (for example, red lentils) cook faster.

But in fact, the secrets of cooking lentils are a little more. For example, professional cooks tend to use last year's lentil seeds in cooking, believing that such raw materials have a more expressive taste. But this also sets a certain dependence: the longer the seeds were stored before the dish was created, the longer they need to be soaked. Those that have lain for up to six months are usually soaked for 6-8 hours, and those that have been stored for about a year can be left in water even for a day. In this case, the seeds are saturated with water and approximately double in size.

It is not recommended to speed up the soaking process by adding soda - this will ruin the taste.

However, at home, impatient housewives usually significantly reduce the soaking time to 1-2 hours for green and brown seeds. And red and yellow grains, as a rule, are not soaked at all - such varieties are already well boiled, so they are taken for thick lentil soups and mashed potatoes. However, in any case, the grains are thoroughly washed beforehand.

In cosmetology

Lentils are included in the list of those products, the use of which leads to a noticeable change in the condition of the skin. A bean-vegetable salad with olive oil was even tested on volunteers in one of the experiments of scientists at the University of Melbourne (The University of Melbourne). As a result, the number of facial wrinkles in people who switched to such a diet decreased by 32%.

But lentil components can directly affect the skin, which is widely used in home cosmetology in the manufacture of moisturizing, healing and anti-aging masks.

- **Moisturizing lentil mask.** The ground seeds of the plant (2 tablespoons) are poured with warm milk until the lentils have a puree-like consistency. Olive oil (1 tsp) is added to the resulting slurry, after which the mask is applied to the face for a quarter of an hour. Wash it off with warm water, rubbing the skin with an ice cube.
- **Lentil mask for oily skin.** Lentil seeds (2 tablespoons) are boiled, the water is drained, and the remaining grains are mashed, where honey (1 teaspoon) and egg white are then added. 15 minutes after application, the mask is washed off with water at room temperature.
- **Lentil rejuvenating mask.** Raw lentils are crushed and mixed in equal proportions with sour cream. For one mask, you will need about 1 tablespoon of the ingredients. A quarter of an hour after application, such a mask is washed off with green tea.

There is also a summer "life hack" associated with lentils: in case of a sunburn, gruel from ground seeds will relieve inflammation and restore skin regeneration.

Dangerous properties of lentils and contraindications

If you follow simple dietary rules, lentils do not have a harmful effect on human health, but in certain cases, its use should be limited.

So, you will have to abandon lentils during exacerbations of gastrointestinal diseases. In addition, due to the purine compounds contained in lentils, they (like most other legumes) should not be eaten with gout and in case of a predisposition to this disease.

As for potentially dangerous compounds, toxic fasin and phaseolunatite were found in raw lentils. But they are neutralized by soaking and exposure to high temperatures during cooking. And since lentils are not eaten raw, this danger should be classified as conditional.

Also, phytic acid contained in whole lentils (about 0.45-0.5%) can have a potentially dangerous effect on the body. However, a significant part of it can also be neutralized during long-term (about 12 hours) soaking in warm acidified water and cooking the product for 20-30 minutes. The harm from phytic acid is also reduced when lentils are combined with carrots, pickled vegetables and foods containing vitamin A. In addition, the human body itself is able to effectively cope with phytates.

Selection and storage

When choosing lentils, they are most often guided by what dishes are supposed to be prepared from it.

- **Red (bright orange) lentils.** It cooks faster than other types, it is very soft, and therefore it is chosen for mashed potatoes. At the same time, it does not retain its bright color in the dish, becoming yellow-brown after cooking.
- **Yellow lentil.** Initially, it has a yellow color of almost ripe grain. It is popular because it also cooks quite quickly, while the grains retain their shape. Choose yellow lentils usually for soups.
- **Olive green lentils.** Most often, unripe seeds of a plant have this color, although "French" lentils can also be found on store shelves, where dark green is the color of the cultivar. In this case, bluish dots are usually visible on the grains. They choose green lentils for salads and "species" side dishes, since these seeds almost do not boil soft, although they take a long time to cook.
- **Black lentil.** As a rule, black lentils on the shelves are the seeds of the Beluga plant. It is small, therefore, it resembles beluga caviar in size and color, which is why it got its name. It is taken for any dishes, but it looks especially expressive as a side dish. At the same time, Beluga lentils should not be confused with simply overripe and darkened grains. However, the risk of making a mistake is minimal, because Beluga is usually sold already packaged with a label from the manufacturer.

When buying packaged lentils, you should pay attention to the presence of condensation on the inside of the packaging surface. It shouldn't be. Also, there should be no mold, pests, dust and foreign particles. The grains should be the same in size and color, smooth, with even edges, have a crumbly structure (do not stick together). It is important to pay attention to the limitation on the expiration date indicated on the package.

If lentils are sold by weight, then you can try to evaluate its smell. The smell of the grains is not very strong, but good lentils usually manage to capture the nutty flavor. But the healthy appearance of the seeds still remains the main criterion when choosing a product.

In addition, you can buy canned lentils in stores. Here, first of all, you need to pay attention to the stamped expiration date and the absence of damage on the jar or lid. If lentils are preserved in a glass jar, then the number of grains in it should exceed the amount of liquid poured.

It is better to store such jars, like packaged lentils, in a dark place at room temperature. For lentils poured into a cloth bag or plastic container, it is important that the storage location is as dry as possible.

As you can see, there were times when lentils were one of the most important components in the human diet. And although it has never completely fallen out of the list of valuable products, in our country its popularity has not been very high until recently. However, we hope that with the growth of people's awareness of the beneficial properties of lentils, the share of lentil dishes in our menu will also grow.

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Lentils - useful properties, composition and contraindications

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



Turmeric (lat. *Cúrcuma*)

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

Keywords: turmeric , benefits, harm, beneficial properties, contraindications

Turmeric is also called *yellow ginger*, *Curcuma longa*, *turmeric*, *E100* (as its main polyphenols, curcuminoids, are indicated on product labels). Almost everyone has heard about the miraculous benefits of turmeric, but lately, skeptical voices have been heard more and more convincingly, questioning its benefits. What is this fragrant, sharply bitter Indian spice really? Let's figure it out in this article.

Beneficial features

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

Main substances (g / 100 g):	Ground turmeric contains
Water	12.85 g
Carbohydrates	67.14 g
Squirrels	9.68 g

Fats	3.25 g
Calories (kcal)	312 kcal
Minerals	mg/100 g:
Potassium	2080
Phosphorus	299
Magnesium	208
Calcium	168
Iron	55
vitamins	mg/100 g:
Vitamin C	0.7
Vitamin PP	1.35
Vitamin B2	0.15
Vitamin B6	0.107
Vitamin B1	0.058

100 grams of the product contains approximately 80% of the daily requirement of potassium, 50% of the daily requirement of magnesium, 30% of phosphorus, about 17% of calcium, a lot of iron.

However, taking into account the fact that no one uses turmeric in such volumes, and even for medicinal folk remedies, no more than 3-5 grams of turmeric is taken per day, it is impossible to restore the deficiency of minerals with the help of turmeric. And most of the medicinal properties of turmeric are associated not with the vitamin-mineral complex, but with curcumin (diferuloylmethane) - a natural polyphenol contained in the rhizome of the plant.

Curcumin is a bright orange-yellow crystalline compound that is often used as a food coloring. Let's dissolve curcumin in alkalis and in very sour solvents.

In addition to curcumin, there are other components in *Curcuma longa* that are part of the curcuminoids group: demethoxycurcumin, bisdemethoxycurcumin. And although curcumin is still the most abundant of this group (75-77% of the total weight), some researchers believe that the potential therapeutic effect is due to the synergistic action of all curcuminoids. The total mass of all substances in this group is about 5% of the mass of the original product.

Among other components of turmeric, sesquiterpenes (in the composition of essential oil) ^[2], 9 types of terpecurcumins ^[3], more than a dozen glycosides are found. ^[four]

Medicinal properties

For the past half century, laboratories around the world (mainly on cellular material and on experimental animals) have been studying the healing properties of turmeric that people have been using in folk medicine for centuries. Thus, the therapeutic effects of turmeric in relation to diabetes, allergies, arthritis, cardiovascular diseases, Alzheimer's disease, and some forms of cancer were discovered.

However, this therapeutic potential, revealed in the laboratory, is not always able to be used in the treatment of patients. The reason is both the low bioavailability of curcumin (the main therapeutic component of the spice) and the mild therapeutic effect of low doses. Moreover, in some experiments, its potentially dangerous or harmful properties were revealed.

To date, two almost opposing points of view have been presented in views on the potential medicinal properties of turmeric:

1. According to the first, turmeric is a promising product for obtaining drugs for cardiovascular diseases, neurodegenerative disorders, liver diseases, and certain types of cancer.
2. According to the second, the medicinal properties of turmeric and its specific polyphenol curcumin are grossly overrated. So, if we can talk about some kind of therapeutic effect, it is very insignificant.

To understand the health benefits of turmeric, let's take a closer look at both points of view.

Optimistic version: turmeric is a promising basis for drugs

Curcumin is credited with numerous pharmacological properties: antioxidant, antimicrobial, anti-inflammatory. This compound is believed to be able to interact with a variety of molecular targets involved in inflammation. Clinical trials indicate that curcumin may have potential as a therapeutic agent for diseases such as inflammatory bowel disease, pancreatitis, arthritis, and chronic anterior uveitis (inflammation of the choroid), as well as some types of cancer.

Antioxidant, anti-inflammatory activity of compounds of the curcuminoids group was confirmed experimentally. There are scientific works showing the potential ability of curcumin to activate the protective function of macrophages, which destroy foreign microorganisms and toxic particles. Due to these properties, turmeric can be used, for example, as an adjuvant therapy for ulcerative colitis, which is characterized by dysfunction of the immune system.

In a laboratory study by a University of California research team, it was shown that one of the curcumins (bisdemethoxycurcumin) can act as an immunomodulator that stimulates monocytic phagocytosis of beta-amyloid, the accumulation of which is considered the cause of Alzheimer's disease. ^[5]

There is also an assumption that curcumin increases the level of the hormone, which, in turn, provokes the creation of new nerve cells, and this creates the prerequisites for combating degenerative processes in the brain.

But the therapeutic effect of curcumin is not limited to this, and in the future it can be used to treat a number of other diseases of various organs:

- **Heart and blood vessels.** Several therapeutic effects are associated with the beneficial effect of curcumin on the function of the cells of the inner surface of blood vessels (endothelium), including lowering blood pressure, normalizing blood clotting (destruction of the endothelium leads to poor blood clotting), and lowering cholesterol levels in patients with type 2 diabetes. In particular, the standardized curcuminoids preparation (NCB-02) has shown to be as good at restoring endothelial function as atorvastatin (3rd generation statin drug). ^[6]
In one clinical trial, the use of curcumin at a dose of 4 g/day resulted in a significant reduction in the risk of myocardial infarction after coronary artery bypass grafting. ^[7]
- **Antitumor effect.** In a rodent model, curcumin prevents colon cancer. This occurs due to the inhibition of lipid peroxidation and the expression of cyclooxygenase-2 ^[8], as well as due to the activation of a certain kind of enzymes. ^[9] But, in addition to this, a number of studies describe the effect of curcumin on various genes and proteins, which prevents the development of tumors at the 2nd and 3rd stages (stimulation and progression) of the disease. ^[ten]
- **Liver.** Curcumin enhances the activity of many antioxidant enzymes, which by reducing lipid peroxidation may ultimately reduce liver damage. ^[11] But it is also able to increase the activity of detoxifying enzymes in the liver, protecting the organ from carcinogenesis. ^[12]
- **Joints.** Curcumin supplements are already being tested as a means of reducing pain in joint diseases. In a randomized pilot study evaluating the efficacy and safety of curcumin in patients

with active rheumatoid arthritis, the curcumin group had the highest percentage of improvement in overall activity scores, as well as joint tenderness and swelling. Moreover, these indicators turned out to be significantly better than in patients treated with diclofenac sodium, and curcumin treatment itself was considered safe and had no side effects. ^[13]

- **Respiratory system.** The first evidence suggesting that curcumin works against lung injury appeared in 1996. ^[14] Since then, several animal studies have demonstrated that curcumin acts against pulmonary fibrosis, mainly by reducing inflammatory mediators. ^[15] Several cellular and mouse studies have confirmed that curcumin also has potent anti-asthma activity. ^[16] The ability of curcumin to reduce synthesis and improve nitric oxide excretion may prevent bronchial inflammation in patients with asthma. ^[17]

Skeptical version: is turmeric useless?

In 2017, a paper ^[18] was published, in which the authors, having studied existing clinical studies, questioned almost all of the above therapeutic effects of turmeric. Curcumin's activity in vitro and animal experiments has led to more than 120 clinical trials of curcuminoids, according to scientists. But no double-blind, placebo-controlled clinical trials of curcumin have been completely successful. The authors explain this by the fact that this compound manifests itself as unstable, reactive, non-bioavailable.

This is not to say that the researchers did not receive positive results at all. For example, in 2019, more than 700 people took part in an experiment evaluating the effects of curcumin on blood pressure. The results showed that with long-term use (at least 12 weeks), there was a noticeable decrease in the "upper" (systolic) pressure. But in general, limiting the therapeutic usefulness of curcumin has indeed proved to be a problem and prompted researchers to begin searching for effective combinations of curcumin with other substances to increase systemic bioavailability.

Thus, a study that assessed the bioavailability of a combination of the alkaloid piperine (present in various types of pepper) and curcumin was quite widely known. ^[19] The experiments were carried out both with animals and with the participation of healthy human volunteers.

- In rats, administration of curcumin at a dose of 2 g/kg resulted in moderate serum concentrations within 4 hours. Simultaneous administration of piperine at a dose of 20 mg/kg increased the concentration of curcumin in the blood serum for a short period (1-2 hours after taking the drug), and the bioavailability of the compound increased by 154%.
- In humans, after receiving curcumin at a dose of 2 g/kg, its serum level was either undetectable or very low. But after adding piperine, the bioavailability of the compound increased by 2 thousand percent.

This multiple increase in bioavailability during popularization has formed the opinion that it is enough to eat turmeric with pepper to get the expected therapeutic effect.

However, in this study, the alkaloid piperine was used to increase bioavailability, rather than herbal components containing it. The alkaloid itself is indeed found in many varieties of pepper crops. But in long pepper its content does not exceed 2%, and in white and black pepper - 9%.

Therefore, although mixing turmeric with black pepper probably does increase the bioavailability of curcumin, with such a "homemade" combination in food, it is not entirely correct to talk about an increase in bioavailability by thousands of percent. Accordingly, it is also not necessary to expect a pronounced therapeutic effect from adding spices to food, despite the full therapeutic potential of curcumin.

In medicine

Given the emerging controversy, the future of turmeric in mainstream medicine remains uncertain. Although some practitioners already today declare turmeric a therapeutically significant part of the healing diet.

In particular, oncologist Ivan Karasev, on his Instagram page, not only praised the organic spice for its anti-inflammatory properties, the ability to stimulate the death of cancer cells and enhance the effectiveness of chemotherapy, but also described in detail how to drink turmeric to get maximum protection against cancer.

According to the doctor, the optimal daily dose of turmeric is 5 grams (about 1 tsp). But for better absorption, it is better to mix it with linseed oil and black pepper. And to prepare 250 ml of a healthy and invigorating drink, in addition to warm water, you will need to mix turmeric (1 tsp), chopped ginger root (about 1 cm in length), half a lemon, honey (1 tsp) and black pepper (on the tip of a knife). If the taste seems too sour, spicy, bitter, etc., then the proportion of ingredients can be slightly changed to suit your taste.

Since the information from the post was reprinted by large media with an audience of millions, this point of view in the mass consciousness has acquired the status of “doctors' recommendation” and is often broadcast as factually proven. Although in evidence-based medicine, the effectiveness of the spice (and not the active components isolated from it) is still a controversial issue.

In folk medicine

Golden turmeric has been used in folk medicine for centuries to improve the functioning of the digestive system. This application is based on the potential ability of the biologically active components of turmeric to activate the secretion of the glands of the gastrointestinal tract, as well as bile formation, which ultimately improves metabolism and digestion.

In home treatment, turmeric is used for chronic cholecystitis, because, in addition to the ability to activate the formation and secretion of bile, the spice can exhibit an anti-inflammatory effect.

In large doses, turmeric acts as a laxative and diuretic.

The antioxidant potential allows the use of turmeric in folk medicine for the treatment of the liver. It is believed that the substances contained in the rhizomes protect this organ from the effects of long-term use of drugs, exposure to fatty foods and alcohol. In combination with turmeric, all of these products cause less harm. Therefore, the presence of dishes with spices during feasts in folk medicine is welcome. But other pathologies of the gastrointestinal tract, caused by a decrease in liver function, become the basis for including turmeric in the diet.

Old recipes contained a recommendation to eat 3.5 grams of the root of the plant to eliminate "blockage of the liver." But the same dose, combined with anise (3.5 g) mixed with white wine, could, according to ancient healers, improve vision. For the same purpose, the eyes were sprinkled with grated turmeric powder and the condensed juice of the plant was instilled into them.

Increase the amount of turmeric in food and for the prevention of atherosclerosis. Regular addition of seasoning in this case should reduce cholesterol, slow down the formation of deposits in the vessels and generally improve well-being.

Turmeric is used externally as a pain reliever. For example, to get rid of a toothache, the root is roasted and chewed while it is still warm. A warm grated spice is applied to wounds and ulcers, not only to eliminate pain, but also to stop bleeding and heal faster.

An effective antibiotic in folk medicine is turmeric with honey. Mixed in the proportion of 1 tbsp. l. powder per 100 g of honey, turmeric helps to heal wounds and recover faster after dislocations. However, the same mixture of 1 tsp. per hour can be taken for colds.

To increase the healing properties of turmeric during the preparatory period, the washed root of the plant is boiled or scalded. It is believed that after such extreme exposure, curcumin begins to be evenly distributed throughout the root, penetrating into all layers. Also, raw materials can be dried in the sun. After a week of drying, the root will significantly decrease in size, but the concentration of curcumin in it will be higher.

in oriental medicine

Turmeric has been traditionally used in Asian countries as a remedy for a number of pathologies due to its antioxidant, anti-inflammatory, antimutagenic, antimicrobial, and anticancer properties. The spice has a reputation as a reliable healing, laxative, anthelmintic, tonic. The rhizome is an important ingredient in such herbal preparations as Jātyādi tailam, Nalpāmarādi tailam, Nārāyaṇa guḷa.

In the Indian medical system of Ayurveda, turmeric is used very widely, prescribing both simply to restore the strength of weakened patients, and to treat such serious diseases as diabetes and anemia, although the full list of diseases and pathologies in which the spice is used is much longer. It includes smallpox, anemia, anorexia, leprosy, bronchitis, dropsy, gonorrhea, liver damage, various diseases of the organs of vision, dizziness, skin diseases, edema, burns, all kinds of ulcers and wounds, boils, sprains, hysterical conditions. According to Ayurveda, turmeric helps with scorpion and leech stings, as well as with scabies, dyspepsia, and ringworm.

As a preventive measure, women in India still lubricate their bodies with turmeric paste, considering it an effective antiseptic.

In traditional Chinese medicine, turmeric is in demand as an analgesic and anti-inflammatory agent. In particular, it is used to eliminate hemorrhoidal pain. Turmeric is also used with benefits for women. It is added to food for prolonged menstrual irregularities.

The root extract of the plant is part of the ancient herbal medicine "Jiawei-Xiaoyaosan" (Jiawei-Xiaoyaosan), which was used for dyspepsia, stress and mental disorders. ^[twenty]

In scientific research

The bioavailability of curcumin can be called the cornerstone of controversy between turmeric drug advocates and skeptics. The latter believe that curcumin is extremely difficult to use in medicine due to its low bioavailability. Therefore, here we will review studies that raise this issue.

The first study of the bioavailability of a substance took place back in 1978. ^[21] Then, in experiments on rats, scientists injected animals with curcumin at a dose of 1 g/kg, fixing a low level of curcumin in blood plasma as a result of the experiment.

More recent studies have shown that when curcumin was administered orally at a dose of 2000 mg/kg, the maximum concentration in the serum of experimental animals was $1.35 \pm 0.23 \mu\text{g/ml}$. But even when administered orally, as shown by Chinese scientists ^[22], the bioavailability of curcumin is about

1%, and therefore very high doses of curcumin (from 3600 to 12000 milligrams) are needed to achieve any beneficial effects.

In clinical studies, curcumin metabolites have been found in plasma when patients have taken at least 3600 mg of curcumin (more specifically, curcumin glucuronide and its sulfate forms).^[23]

However, along with increasing the dose and, in some experiments, scientists have been able to enhance the therapeutic effect by combining curcumin with other substances and / or foods that increase its bioavailability.

So it was found that if curcumin is administered to rats along with piperine (which induces glucuronyl transferase enzymes), the bioavailability of the substance increases by 154%.

When curcumin was administered to animals at a dose of 2 g/kg, moderate serum concentrations were reached within 4 hours. Simultaneous administration of piperine at a dose of 20 mg/kg increased the concentration of curcumin in the blood serum for a short period (1-2 hours) after taking the drug.

In people participating in the experiment, after a dose of 2 g of curcumin, serum levels were either undetectable or very low. But the simultaneous administration of piperine at a dose of 20 mg caused much higher concentrations from 0.25 to 1 hour after drug administration, and the increase in bioavailability was 2000%. The study showed that, at the dosages used, piperine increased the serum concentration, absorption rate, and bioavailability of curcumin in both rats and humans without side effects.^[19]

In subsequent studies, it was found that the excretion of curcumin metabolites depends not only on the combination of substances, but also on the vehicle used and the forms of administration.^[24] When taken orally, 75% of curcumin metabolites are found only in feces, but not in urine. When administered intraperitoneally, 73% of these metabolites are found in the feces and about 11% in the urine. And given intravenously to mice, one form of curcumin accumulates in the liver, spleen, lungs, and brain.^[25]

In terms of form, liposome encapsulation, polymeric nanoparticles, cyclodextrin encapsulation, lipid complexes, or polymer-curcumin complex synthesis have been investigated. All of them helped to increase the activity and bioavailability of this compound in animal experiments.

Weight regulation

Turmeric for weight loss is widely used, but not always justified. The smell of spice and even its color increase the attractiveness of the dish and stimulate appetite. Actually, this is the main task of both this and any other spice. Therefore, food with turmeric at dinner can be eaten much more, and this does not contribute to weight loss.

However, on the other hand, adding turmeric to your diet can improve digestion and metabolism, allowing your body to use what you eat more efficiently and effectively.

At the same time, for a noticeable effect, large dosages are likely to be needed, which can provoke a laxative effect. But in the recipes published on the Internet, in most cases, just large dosages are indicated.

For example, a recipe for weight loss is popular, in which 2 teaspoons of turmeric (which is about 10 grams of spice) are recommended to be poured into a glass of hot milk and, after the drink has cooled to a warm state, add a spoonful of honey to it.

Since there is no objective experimental data on the results of the effect of such a drink from turmeric on body weight and waist size, one has to focus on the subjective impressions of people who have experienced it for themselves. And these impressions are very contradictory. Therefore, we draw attention to the fact that even Indian naturopathic healers (usually using turmeric quite freely and widely) do not recommend exceeding a single dosage of 7 grams for any spice intake.

In cooking

In cooking, turmeric is considered as an auxiliary ingredient that improves the taste, smell and appearance of the dish. The beautiful and varied yellow-orange hues of the seasoning make puddings, omelettes, pasta and rice dishes, lamb, beef, chicken, fish, as well as broths and soups more appetizing. And to add flavor and color to this spice, you don't need much at all: a quarter of a teaspoon per serving of 4 dishes. For example, when cooking pilaf, you will need about a quarter of a teaspoon per kilogram of rice.

In the food industry, orange turmeric is used to color cheeses, butter, and margarine. The technological process simplifies the fact that this spice is relatively easily soluble in fats. By the way, the fact that water hardly interacts with turmeric helps to distinguish the more expensive ground stigmas of saffron from the relatively inexpensive turmeric powder: when saffron powder is immersed in water, unlike turmeric, it will tint it.

Without this experiment, it is more difficult to distinguish one ingredient from another, since color saturation can also be ensured by adding ground red pepper to the powder.

However, even without mixing, turmeric can acquire an intense color. To do this, the rhizomes are dug up, washed, and, in a purified form, are dipped in boiling water for a short time, and only then dried and polished. After this treatment, the roots become brighter, harder and shiny at the broken points.

The further culinary fate of the rhizomes largely depends on the type of plant:

- **Turmeric long** (*C. longa*) is used in the form of a powder for spices, including - in a mixture with other spices. For example, in the composition of the famous curry mixture, the proportion of turmeric can reach 15-20%.
- **Aromatic turmeric** (*C. aromatica*) is more in demand in confectionery shops.
- **Turmeric zedoaria** (*C. zedoaria*) is used in the production of alcoholic beverages (liqueurs) and, as a rule, is not ground into powder, but cut into small pieces.

Turmeric is included in many recipes in Asian cuisine, but one of the most beautiful, simple and healthy is the golden milk recipe.

Turmeric milk is a health drink that can still be drunk on an almost regular basis. To prepare it, you will need low-fat milk (200 ml), water (50 ml), 1 teaspoon each of turmeric, honey and coconut (or linseed) oil.

1. Turmeric powder is boiled in boiling water for 5 minutes (from the moment of boiling).
2. Milk and butter are poured into the mixture, after which all this is heated to 50-60 ° C.
3. After cooling to a warm state, honey dissolves in the drink.

In cosmetology

The cosmetic benefit of turmeric for the face is that curcumin improves blood circulation, activates the process of renewal and regeneration of the skin, prevents acne, heals acne marks and small wounds, activates collagen synthesis, brightens the skin.

This ingredient (often referred to as Turmeric on stickers) is widely used by skincare manufacturers. Examples include:

- Kiehl's Energizing Radiance Mask, which tightens pores and renews the stratum corneum,
- Hello Fab First Aid Beauty vitaminized mask in the form of jelly, which cools and soothes the skin, evens out wrinkles,
- Kora Organics Turmeric Brightening & Exfoliating Mask with alpha hydroxy acid, which evens out the texture of tissues and eliminates pigmentation, etc.

In home cosmetology, in the manufacture of masks, to facilitate the application of spice powder and to enhance the effect, turmeric is usually mixed with honey, milk, egg yolk and other ingredients.

Sometimes women tend to use turmeric to solve some problems in which the spice is unlikely to be able to help. For example, on forums you can sometimes read that turmeric eliminates cellulite and increases breast size, which is not true.

However, there are some specific problems that turmeric can actually solve. So, a randomized double-blind study showed that turmeric essential oil slows down hair growth and can lighten the skin in the armpits. ^[26]

In this experiment, for several weeks, women applied 1% and 5% turmeric essential oil in a lotion to the skin in the armpit area. From 5-11 weeks of testing, the oil slowed hair growth by an average of 13% with the 1% lotion and by an average of 16% with the 5% lotion. At the same time, both concentrations of oil were equally effective in brightening the skin for 3 weeks, and the lightening effect persisted for another 2 weeks after the cessation of exposure to the skin.

Dangerous properties of turmeric and contraindications

Both as a dietary supplement and as a drug, curcumin is approved in the United States, where it is considered a safe compound in daily amounts up to 10 g at the recommended dose of 3 mg/kg body weight. Such recommendations are based on previous preclinical and, less commonly, clinical studies. However, the experiments taken as the basis for evaluating the danger/safety of curcumin were conducted no longer than 16 weeks, which introduces certain risks when using curcumin for a longer period and, especially, at high doses.

With the abuse of spice, "response" reactions of the gastrointestinal tract in the form of nausea or diarrhea are quite possible. When trying to "cleanse the body" with shock doses of turmeric, biliary colic and exacerbation of gastritis are possible. People can also experience allergic reactions to turmeric.

Contraindications for the use of turmeric as a dietary supplement are exacerbations of cholelithiasis, cholecystitis and hepatitis. There is a suspicion that turmeric itself is capable of provoking the occurrence of autoimmune hepatitis. This is explained by the fact that curcumin inhibits the liver enzyme, which provides a detoxifying effect, and, therefore, indirectly enhances the toxic effect. However, these suspicions remain unconfirmed for the time being, and the effect requires further study, since the dosage and / or combination of the compound with other substances may affect the degree of its severity. In addition, as mentioned above, at the same time, curcumin is able to increase

the activity of detoxifying enzymes in the liver and kidneys, protecting against carcinogenesis processes.

Spice is not recommended for kidney diseases (nephritis, glomerulonephritis), as well as during pregnancy. Some experts suggest that hot spices included in the diet in the last trimester can cause premature contractions. But, besides this, the ability of turmeric to thin the blood can have a negative effect on the fetus. For the same reason, turmeric should not be added to food for people taking aspirin and similar blood thinning medications, since such a dietary supplement does not allow for dosage control.

Because of turmeric's supposed ability to lower blood sugar levels, care should be taken when "mixing" the spice with anti-diabetic medications.

During the period of breastfeeding, nursing mothers often begin to deliberately increase the dose of spices to increase lactation "according to the Indian folk recipe." But this should not be done, since there is no comprehensive data on the effect of curcuminoids on the health of the child and on their entry into the body of an infant with breast milk.

Selection and storage

Turmeric is commercially available in two forms: as a whole root and as a powder. Therefore, below we formulate the selection rules for both forms of spice.

How to choose turmeric powder

The main rule for choosing ground spices is sealed packaging. In the markets, turmeric is sold from open containers, which do not isolate it from the effects of the environment (light, oxygen, etc.), so this spice loses both taste, smell, and useful properties. But when buying in stores, you should pay attention to the expiration date and refuse expired goods. Even in an airtight bag, the powder should remain crumbly and not roll into lumps.

How to choose turmeric root

In general, turmeric retains its beneficial properties better than ground turmeric. The root may have different shades depending on the growing conditions (growth) and variety, therefore, when choosing a bright color, they usually do not focus and pay more attention to the density of the pulp. The root should be elastic and "voiced" when breaking.

In addition to density, the freshness of turmeric can be determined by smell. If you break the root or pick it up a little, then the smell of fresh turmeric will be pronounced and bright.

How to properly store turmeric

To preserve the aroma, prevent the accumulation of moisture and the formation of lumps, and also prevent the damaging effects of ultraviolet radiation, it is better to store turmeric in a hermetically sealed opaque glass jar or in a dry, dark place at room temperature.

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Turmeric - useful properties, composition and contraindications

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



food for inflammation

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Abstract. The article deals with inflammatory processes and their impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Foods that will help reduce inflammation are indicated, the scientific basis of nutrition against inflammation is considered.

Keywords: inflammation, diagnostics, healthy foods, dangerous foods

If you want to help your body fight inflammation, look in the fridge first - most health problems are caused by unhealthy foods. While medications are important during treatment, an anti-inflammatory diet is often just as effective, as scientific evidence supports. Find out how food affects inflammation in the body, what disease provocateurs are in your diet, and what you need to put on your plate to be healthy.

What happens in the body during chronic inflammation?

Inflammation is the body's defense response to infection, irritation, or injury. If a short-term inflammatory process protects us, then a chronic one is associated with an increased risk of developing diabetes, asthma, heart attack, autoimmune disorders, and oncology. Dangerous damage is not felt for a long time, and the fight against pain with anti-inflammatory drugs often leads to side effects and complications. Proper nutrition is what really prevents diseases and prolongs life.

Early symptoms of chronic inflammation are fatigue, dizziness, and nausea. They can be caused by obesity, stress, diabetes, bile stasis, liver disease and go unnoticed for years.^[1, 2, 3, 4] If measures are not taken in time, the risk of developing a heart attack, cancer, dementia and other dangerous conditions increases significantly.

Diagnosis of inflammation

To combat negative processes, the body increases the production of leukocytes, immune cells and cytokines. Therefore, the easiest way to measure inflammation is to take a blood test for several markers:

- **C-reactive highly sensitive protein, hs-CRP** - indicates problems in the walls of blood vessels, the development of atherosclerosis;
- **homocysteine** - leads to the formation of blood clots, makes the walls of blood vessels loose, promotes the deposition of cholesterol and atherosclerotic plaques;
- **tumor necrosis factor-alpha, TNF-alpha** - increases in severe infectious, allergic, autoimmune, oncological diseases;
- **interleukin-6, IL-6** - indicates the severity of acute pancreatitis, kidney damage, autoimmune diseases, oncology, etc.;
- **glycated hemoglobin, HbA1C** - blood sugar (glucose) levels help detect diabetes.

These markers increase harmful foods: sugar, high fructose syrups, trans fats, refined carbohydrates, alcohol, sausages. ^[5, 6, 7, 8, 9] The main non-dietary factor contributing to their increase is a sedentary lifestyle, including frequent sitting. ^[ten]

How to Reduce Inflammation Without Medications - An Effective Anti-Inflammatory Diet

Each meal should provide the body with proteins, fats, carbohydrates. You also need to satisfy his needs for water - 30 ml per 1 kg of body weight per day, - fiber, vitamins. It is desirable to increase the amount of foods with antioxidants that neutralize free radicals and prevent the development of oncology.

The Mediterranean diet is considered the most anti-inflammatory - it reduces CRP and IL-6 markers. ^[11] It focuses on whole grains, vegetables, fruits, fish, and limits the intake of unhealthy fats, carbohydrates, and refined sugars. The DASH diet, vegetarian and low-carbohydrate diets also reduce inflammation. ^[12, 13]

Top 10 Anti-Inflammation Foods with Proven Benefits

1. Bone broth

Boiling lamb, beef, pork bones in water with a little vinegar helps to release vitamins, fatty acids, zinc, manganese and amino acids from the bone marrow. They are necessary for the healing of the intestinal mucosa, in which up to 80% of immunity is concentrated. ^[14, 15]

2. Green vegetables and leafy greens

Spinach, arugula, beet leaves, peppers, celery and all types of cabbage - Brussels sprouts, cauliflower, white cabbage, broccoli - are useful raw if there are no gastrointestinal pathologies. For many stomach problems, only Chinese cabbage is suitable, and cooked vegetables are better tolerated than raw.

3. Berries

Blueberries, raspberries, goji, strawberries, cranberries, grapes are the most useful berry crops. ^[16, 17, 18, 19] They contain less fructose and more beneficial compounds than fruits.

4. Fermented foods

Kombucha, apple cider vinegar, fermented vegetables contain valuable bacteria and act as probiotics. Sauerkraut, cucumbers, tomatoes are excluded for acute diseases of the gastrointestinal tract, but after normalization of the condition, they can be gradually added to side dishes. ^[twenty]

5. Fatty fruits

Avocados and olives are valued for their low glycemic index and high concentration of omega-3s, vitamins, folic acid, and copper.

6. Healthy fats

Coconut, olive, linseed, ghee are the most valuable. Coconut is suitable for making desserts and frying because of its high smoke point.

7. Oily fish

Salmon, herring, mackerel are the richest in omega-3 and cleanse the walls of blood vessels from excess cholesterol.

8. Nuts

Almonds, pistachios, cashews, pecans, macadamia, walnuts and Brazil nuts are a storehouse of vitamins A, B, C, D, E. For maximum benefit, it is enough to eat 30 g of nuts per day.

9. Spices

Ginger, garlic, turmeric, cardamom, rosemary, black pepper, cinnamon and many spices popular in India are great at fighting infections.

10. Green tea

The drink is rich in polyphenols, catechins, antioxidants. It suppresses inflammation, accelerates metabolism and weight loss. ^[21, 22]

Other Ways to Fight Chronic Inflammation: Secrets to a Fast Recovery

Once you add anti-inflammatory foods to your menu, be sure to eliminate pro-inflammatory foods and break bad habits. Research shows that there are a few more simple rules to follow for recovery:

- **take supplements** (omega-3, curcumin, S-adenosylmethionine, zinc, frankincense, cat's claw) and vitamin-mineral supplements in the correct forms to strengthen immunity and eliminate toxins; ^[21]
- **exercise regularly**, because they reduce the risk of chronic diseases; ^[23]
- **goes to bed no later than 11 p.m.** and sleeps for at least 7-8 hours - violation of this regimen causes inflammation in all people, regardless of age and gender; ^[24]
- **walk** - daily exercise does not compensate for the lack of physical activity, so WHO recommends walking at least 7500 steps per day;
- **give up coffee and alcohol** - the benefits of them are exaggerated and people without pathologies get it;
- **focus on maintaining a healthy microbiome** rather than taking probiotics;
- **temporarily exclude milk** with A1 casein and gluten - they are safe for healthy people, but if there is already inflammation, they increase it and cause irritation of the intestinal walls;
- **try intermittent fasting**, if there are no contraindications (optimally 12-hour fasting from 19:00 to 7:00) - a simple method enhances fat burning, slows down aging and maintains normal microflora in the intestines; ^[25]
- **learn to cope with stress** with the help of yoga, meditation, jogging, because any diet is ineffective with a high level of cortisol; ^[26]
- meticulously choose products in stores and dishes in restaurants.

Before taking dietary supplements, it is important to take tests and consult with a nutritionist. Many natural extracts are as effective as drugs and reduce the need for prescription or over-the-counter drugs.

Three simple rules to quickly improve the quality of life

Sometimes inflammation develops in response to triggers that are difficult to avoid - environmental pollution, injury. But you have more control over the situation than you think: an anti-inflammatory diet with sufficient physical activity and good sleep relieves many syndromes and depressions.

No need to wait months or years to see the result and feel better - choose food not for satiety, but for health!

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Food for inflammation

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Abstract. The article deals with inflammatory processes and their impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Foods that will help reduce inflammation are indicated, the scientific basis of nutrition against inflammation is considered.



Blood thinning food

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Abstract. The article discusses the density of blood and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to reduce blood density, the scientific basis of nutrition for its thinning is considered.

Keywords: blood, blood thinning, thick blood, healthy foods, dangerous foods

Thick blood impairs the supply of oxygen, hormones and nutrients to the cells. It can lead to heart attacks, stroke, and kidney damage, so doctors prescribe *anticoagulants to reduce its viscosity* . But there is a list of products that thin it naturally. Research shows that certain foods are effective in improving circulation and reducing the risk of vascular problems that affect the heart, brain, intestines, eyes, and other organs.

Thick Blood Facts: Causes, Diagnosis, Risks

Hypercoagulation - a violation of the blood coagulation process - is provoked by several factors:

- excess red blood cells, erythrocytes;
- chronic and genetic diseases (systemic lupus erythematosus, factor V Leiden and G20210A mutations in the prothrombin gene, etc.)
- an excess of certain proteins.

Other factors such as chronic inflammation, smoking, diabetes, unhealthy eating habits, and elevated "bad" cholesterol also cause hypercoagulability. The condition is often asymptomatic until a significant blood clot forms or a malignant tumor appears. ^[one]

The following symptoms should be cause for concern:

- dizziness and weakness;
- causeless bruising;
- blurred vision;
- erratic breathing;
- headache;
- high blood pressure;
- gout.

Blood clots, recurrent miscarriages are serious causes for concern. Anyone who has encountered these problems and who has a family history of thrombosis should take a coagulogram (hemostasiogram), a comprehensive hematological study to determine the state of the hemostasis system. ^[2]

What thickens the blood: foods that need to be discarded

If there is an increased risk of blood clots or already having them, doctors prescribe antiplatelet or anticoagulant therapy. Taking medications may not bring results with improper diet and lifestyle. It is important not only to observe the drinking regimen, eat vegetables, greens and berries, but it is also necessary to avoid an excess of vitamin K - stop taking multivitamin complexes and reduce the consumption of foods with a high content of it.

Plant foods contain vitamin K1, while animal foods contain vitamin K2. The highest percentage of fat-soluble vitamin in dark green leafy vegetables - parsley, spinach, basil, cilantro, lettuce, broccoli, green onions, white cabbage and Chinese cabbage. Dandelion leaves, celery root, prunes, pine nuts, cashews are also undesirable in the diet. ^[3]

Some fruits and berries also contribute to hypercoagulability. The anti-rating includes kiwi, blackberry, blueberry, pomegranate. Among animal products, chicken meat, beef and goose liver contain the most vitamin K. They also need to be excluded and eat more natural food, which helps to reduce blood viscosity.

10 Foods to Naturally Thin Your Blood

1. Turmeric

The active ingredient in the spice is curcumin. It gives it a golden color, acts as an anticoagulant and is safer than aspirin: it prevents the formation of blood clots, stimulates the process of splitting cholesterol and cleansing blood vessels. The spice can be added to soups, milk, smoothies, teas. ^[four]

2. Cinnamon

Cinnamon and its close relative Cassia act as a powerful anticoagulant. Seasonings relieve inflammation, lower blood pressure, but moderation is important in their use. One of the studies confirmed that their long-term and excessive consumption in foods (pastries, teas) can provoke liver damage. Chinese cassia contains more coumarin and is associated with more risks. ^[5]

3. Ginger

The spice contains salicylate, a chemical compound from which acetylsalicylic acid is synthetically obtained. The anticoagulant effect of natural salicylates can be obtained regularly by using fresh or dried ginger. It is added to teas, pumpkin cream soup, pastries, juices. ^[6]

4. Cayenne Pepper

The most spicy red capsicum is famous for its high content of salicylates. Despite the benefits, not everyone can eat it as a condiment and take it in capsule form. ^[7]

5. Salmon

It is known that omega-3 normalizes the consistency of blood, lowers cholesterol levels. You can get polyunsaturated fatty acid not only from salmon, but also from other fatty fish - mackerel, herring, tuna, sardines. ^[eight]

6. Wheat germ oil

The healing liquid contains a lot of vitamin E - a mild and safe anticoagulant. In 100 g, 255 mg of vitamin E was found, and in a tablespoon - 135% of its daily intake. Seeds, sunflower oil, almonds, hazelnuts contain it in smaller quantities, but also reduce blood clotting.

7. Ginseng

Popular in folk medicine, the herb improves blood circulation, lowers sugar levels and effectively controls blood pressure by slowing down the formation of clots. Take ginseng in the form of decoctions, tinctures, capsules.

8. Garlic

Spicy taste, natural antibiotic and antimicrobial properties, antithrombotic action - all this provides a perennial plant. Because of the thinning effect, the American Academy of Family Physicians advises that you stop taking garlic powder and the product itself 7 to 10 days before any surgery. ^[9]

9. Pineapple

The tropical fruit contains the beneficial enzyme bromelain. It is extracted and used in the manufacture of drugs that treat cardiovascular diseases, destroy blood clots and reduce their formation. The enzyme also helps break down protein foods and has a powerful anti-inflammatory effect. ^[eleven]

10. Ginkgo biloba

The plant extract thins the blood, promotes the resorption of fresh blood clots. A laboratory study showed that the effect of ginkgo biloba is similar to the drug Streptokinase. The latter is prescribed for the prevention of retrombosis, reducing the frequency of deaths in myocardial infarction. ^[ten]

Prevention of excessive blood clotting and additional ways to combat the disease

For severe conditions, natural salicylates are not as effective as drugs, but they provide additional therapy support. Doctors advise not relying only on medicines and food - to reduce the risk of blood clots and other complications, you need to make lifestyle changes:

- stop smoking;
- lose weight (with a high percentage of fat);
- maintain daily physical activity;
- do not sit for a long time, often change body position;
- prevent dehydration of the body.

All medications have potential side effects and certain foods should be avoided while taking them due to the risk of interactions. It is desirable to change the diet under the supervision of the attending physician, nutritionist and regularly take tests to monitor the state of health. ^[12]

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Abstract. The article discusses the density of blood and its impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to reduce blood density, the scientific basis of nutrition for its thinning is considered.



food to detoxify the body

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Abstract. The article discusses toxins and their effects on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Foods are indicated to reduce the level of toxins, the scientific basis of nutrition for detoxification of the body is considered.

Keywords: detox, healthy foods, recommendations

A slender toned figure, clean skin without acne, a healthy gastrointestinal tract are the dream of any person. But due to busy work schedules, most people do not adhere to a workout regimen and a balanced diet, which provokes the accumulation of toxins. That is why it is so important to periodically detoxify the body. A few tips will help you wisely choose the food that works best for you and doesn't poison your body.

How do toxins enter the body?

The filtering organs are exposed to a huge load every day - they suffer from exposure to heavy metals, stress, junk food, carcinogenic cosmetics, HEV radiation from gadgets that penetrate the skin deeper than UV rays. A healthy body is cleansed of poisons through feces, urine and sweat - detoxification occurs due to the stable functioning of the liver, lungs, intestines and kidneys.^[1,2] When they do not cope with the task, poisons accumulate and damage tissues, organs:

- destroy enzymes, undermining most of the body's functions - from the production of hemoglobin to the conversion of glucose into energy;
- displace calcium, which causes bone loss;
- damage DNA and accelerate aging, disrupt the production of thyroid hormones.

When the body is most in need of cleansing, our organs are no longer able to cope with the task. In addition, internal autointoxication occurs - toxins are produced by your own body as a result of poor digestion and excretion. It turns out a vicious circle, and getting rid of the toxic burden is very difficult.

What is a detox diet: truths and myths about detox

Detox therapy usually consists of a period of fasting followed by a strict diet based on water, fruits, vegetables, juices, herbal infusions, teas, colon cleansing supplements and deficiencies. Avoid alcohol, caffeine, gluten, red meat, refined sugar, and often dairy products.

7 Signs You Need a Detox:

1. skin problems - rashes, acne, allergies, etc.;
2. intolerance to food, smells;
3. diarrhea, constipation, bloating, flatulence and other digestive problems;
4. reduced resistance to infections - frequent colds, viruses, herpes;
5. weight loss problems
6. fatigue, low energy levels, lack of strength after sleep;
7. inability to concentrate on something, fuzzy thinking.

Avoiding junk food is beneficial in all cases, but some advertised diets involve the use of laxatives, which is dangerous to health and life. Before carrying out any detoxification, you must first pass the tests and consult with a doctor, nutritionist, nutritionist. Sometimes the symptoms that cause the need for cleansing can be a sign of an illness and the need for treatment.

Top 15 Natural Detox Foods:

1. Eggs

The sulfur-rich product enhances the excretion of heavy metals such as cadmium. It also improves the function of glutathione, the main antioxidant needed to protect cells from free radicals. Sulfur can also be obtained from protein foods (milk, meat, fish), broccoli, legumes, nuts, garlic, onions.^[3, 4]

2. Chlorella

Algae is similar in its usefulness to spirulina and contains a lot of chlorophyll, B vitamins. It has been scientifically proven that it detoxifies heavy metals, radiation, lowers sugar and cholesterol. ^[5]

3. Cilantro

Coriander seed enhances the excretion of lead, phthalates, insecticides. The compounds terpinene, quercetin and tocopherols reduce inflammation and slow down the growth of cancer cells in the lungs, prostate, breasts, and intestines. ^[6]

4. Amla

Dried Indian gooseberries contain more antioxidants than other berries, walnuts, cocoa, green tea - about 600-800% of the daily value of vitamin C is concentrated in one berry. Amla also prevents the formation of free radicals that provoke oxidative stress and dementia, asthma, cancer, heart and liver disease. ^[7]

5. Wild Rosehip

Fresh and dried berries are full of vitamins A and C, minerals needed to detoxify organic compounds. They are useful for the immune system, have a diuretic effect, astringent and regenerating properties, which is important for the health and beauty of the skin. ^[eight]

6. Spinach

In 100 g of leaves, almost 200% of the recommended daily norm of vitamin A and 600% of vitamin K were found. The concentrations of manganese, magnesium, folic acid, vitamin C, lutein, zeaxanthin, and carotenes are also high. All of them are necessary to fight aging, oncology, diabetes. ^[9]

7. Oily fish

Salmon, mackerel, herring contain a lot of omega-3. The unsaturated fatty acid lowers blood triglycerides and blood pressure, thereby improving liver and kidney function. Doctors advise eating 2-3 servings of fish per week. ^[ten]

8. Cruciferous vegetables

Broccoli, cauliflower and Brussels sprouts are often recommended for people with kidney disease. They are rich in antioxidants, extremely nutritious and reduce the risk of many types of cancer. Eating five servings a week is enough to get the benefits. ^[eleven]

9. Cranberry

The natural antibiotic is often advertised as a urinary tract supplement. It prevents bacteria from attaching to the urinary tract and protects the kidneys from infection. To get its benefits, just add a handful of berries to oatmeal, compote, salad. ^[12]

10. Aloe Vera Juice

The water of the medicinal plant contains the necessary amino acids for the formation of proteins, enzymes for digestion, sterols to reduce inflammation, electrolytes to maintain water balance and

excretion of metabolic products. The juice is mixed with water and taken in courses or on an ongoing basis to maintain a healthy digestive tract. ^[13]

11. Grapefruit

The fruit helps the liver and kidneys cleanse the blood, which is due to the high levels of pectin. The gel-like fiber adheres to toxins in the blood and removes them from the body with urine, promotes weight loss. Minerals, vitamin A and C additionally protect against harmful bacteria and viruses. ^[fourteen]

12. Sauerkraut

Gut health starts with prebiotics, and pickled vegetables are rich in them and contain probiotics as well. They support the immune system, the detoxification system, and the production of beneficial short-chain fatty acids. ^[fifteen]

13. Turmeric

The seasoning neutralizes key pro-inflammatory molecules that contribute to the development and exacerbation of diseases. But curcumin is poorly absorbed by the small intestine, so curcumin-based supplements are more beneficial. ^[16]

14. Sunflower seeds

Vitamin E, flavonoids and other plant compounds in seeds speed up the movement of food through the intestines and the elimination of toxins. They are also a source of zinc, selenium and other minerals that increase immunity and activity throughout the day. ^[17]

15. Blueberry

Berries have one of the highest levels of antioxidants among fruits and vegetables. And the natural dyes anthocyanins, which give them a characteristic color, further inhibit the growth of cancer cells. But that's not all the benefits of blueberries - eating berries with a high content of potassium and vitamin C for 21 days protects the liver from damage, reduces inflammation and increases the body's immune response. ^[eighteen]

Other Helpful Detox Tips

If you want to be healthier, you need to choose proper nutrition on an ongoing basis and exercise regularly, rather than doing temporary "promotions" of cleansing or losing weight. Develop healthy habits that will allow you to always be in shape:

- drink at least 30 ml of clean water per 1 kg of body weight per day - water removes waste during urination and sweating; ^[19]
- exercise - reduce inflammation and normalize natural detoxification with weekly moderate to high intensity exercise for 75-300 minutes; ^[twenty]
- maintain a healthy weight - extra pounds contribute to the development of non-alcoholic fatty liver disease;
- take antibiotics and any medications only as directed by your doctor;
- arrange a rest for the organs - exclude all allergenic foods for a while, and then gradually return them to the diet;

- limit stress and ensure good sleep - it is important for recharging the brain, removing toxic waste accumulated during the day; ^[21]
- reduce salt intake - it causes the body to secrete antidiuretic hormone to delay urination;
- give up household chemicals and cosmetics with chemicals, replacing them with organic products;
- take care of the cleanliness of the air in the room - ventilate the rooms, quickly solve the problem with dampness and mold, dust regularly and use air purifiers.

Avoiding alcohol, avoiding cigarettes, choosing foods with antioxidants, and other healthy habits will help your body get rid of toxins on a regular basis without medication. The effect that diet has on well-being is amazing - due to proper nutrition and movement, 50-70% of diseases can be prevented. It sounds too simple to be true, but there is no substitute for a healthy lifestyle.

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Food to detoxify the body

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Abstract. The article discusses toxins and their effects on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Foods are indicated to reduce the level of toxins, the scientific basis of nutrition for detoxification of the body is considered.



Food to lower blood sugar

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Abstract. The article considers the optimal level of sugar in human blood and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to reduce the level of sugar in the blood, the scientific basis of the nutrition of its lowering is considered.

Keywords: blood sugar, sugar reduction, healthy foods, recommendations

Properly formulated diet is an important condition for people with prediabetes, diabetes and other diseases that affect the concentration of glucose in the blood. To avoid worsening the condition, you need to choose foods high in fiber. Such food provides a feeling of satiety for a long time and protects against hyperglycemia.

Why does blood sugar rise?

Body weight, stress, and genetics play an important role in the development of diabetes, but maintaining a healthy diet is still crucial. ^[1, 2] Glucose rises every time after a meal:

- any food containing carbohydrates is digested in the stomach and small intestine, where it is absorbed into the blood in the form of glucose;
- in response to an increase in glucose, the pancreas secretes insulin, a hormone that induces cells to use sugar for energy or storage;
- in a healthy person, 2 hours after eating, sugar decreases to those levels that were before eating.

Glucose levels will not drop if carbohydrates are digested incorrectly. The reason may be a small secretion of insulin or resistance to its action (insulin resistance). If after a few hours after eating the condition has not stabilized, this indicates a predisposition to diabetes. To avoid this and stay healthy, you need to give up food that causes a sharp increase in blood sugar. ^[3, 4]

Glycemic index of foods and diet for diabetes

The following foods are most quickly converted into glucose:

- high in carbohydrates - rice, fruits, oat milk, starchy vegetables, any baked goods based on ordinary wheat flour and pasta, as well as products with added sugar (drinks, flavored yogurts, breakfast cereals, etc.);
- high in saturated fats, trans fats - cheese, red meat, fried foods, margarine, peanut butter, cream, frozen dinners;
- sweeteners - honey, agave nectar and maple syrup contain no less carbohydrates than white sugar;
- dried fruits - drying raisins, apricots, plums and other fruits leads to water loss and an increase in fructose concentration.

Glucose is an important fuel for cells when present in the body in normal amounts. Therefore, the rejection of carbohydrates makes the diet unbalanced and deprives the feeling of satisfaction after eating, which can lead to excessive consumption of protein and fatty foods. It is necessary not to refuse carbohydrate products, but to choose their correct form.

All carbohydrates are divided into two categories: simple cause a rapid increase in sugar, and complex - slow, moderate. Some foods have the same high concentration of carbohydrates, but belong to different groups. It's all about the amount of dietary fiber - they slow down the processes described above. For example, whole-grain rye bread is a complex carb, while a French baguette is a simple carb. ^[5]

The rate at which glucose enters the blood reflects the glycemic index (GI). For convenience, tables have been developed in which all foods are ranked on a scale from 0 to 100. The most useful foods have a low and medium GI.

Top 10 Foods to Lower Blood Sugar

1. Broccoli

When crushed or chewed, broccoli produces the substance sulforaphane. The compound has a powerful anti-diabetic effect and reduces markers of oxidative stress. The best way to increase the availability of sulforaphane is to consume lightly steamed broccoli or add mustard seed powder to cooked cabbage. ^[6, 7]

2. Sauerkraut

Fermented vegetables contain probiotics, minerals and antioxidants. They increase insulin sensitivity and prevent the development of hyperglycemia. ^[eight]

3. Pumpkin and pumpkin seeds

Rich in fiber and antioxidants, pumpkin is used as a traditional cure for diabetes in Mexico, Iran. The benefits are provided by the polysaccharides included in its composition. The seeds are full of healthy fats, proteins, and by eating 65 g of pumpkin seeds after a meal, you can reduce sugar levels by 35%. ^[9, 10, 11]

4. Seafood

Fish (salmon, sardines) and seafood are a valuable source of proteins, omega-3s, vitamins, minerals, and antioxidants. Substances slow down digestion, increase the feeling of satiety, prevent hyperglycemia after eating and promote weight loss. ^[12, 13]

5. Nuts and nut butter

Eating peanuts and almonds on an empty stomach and after meals throughout the day as part of a low-carbohydrate diet reduces glycated hemoglobin A1c (HbA1c). To get the effect, it is enough to eat 56 g of nuts daily. ^[14, 15]

6. Oats and oat bran

Whole grains and bran are high in healthy soluble fiber. Over 15 studies have confirmed that oats significantly lower HbA1c when eaten before high GI foods. ^[16, 17]

7. Flax seeds

Fiber and healthy fats are of great benefit - to reduce HbA1c, it is enough to drink 200 g of 2.5% fat yogurt daily mixed with 30 g of flax seeds daily. The effect is confirmed by 25 controlled studies. ^[18, 19]

8. Beans and lentils

The magnesium and protein found in legumes lower blood sugar after meals. And soluble fiber and resistant starch slow down digestion and heal the intestines. ^[twenty]

9. Avocado

The avocado is rich in healthy fats, fiber, vitamins and minerals. It protects against the development of metabolic syndrome - disorders of carbohydrate and fat metabolism, which pose a serious risk to health. ^[21]

10. Calais

Curly cabbage is called a superfood for a reason - the flavonoids it contains, including quercetin and kaempferol, can protect against hyperglycemia and improve insulin sensitivity. To get the effect, it is enough to eat 7-14 grams of feces with a high-carbohydrate meal. ^[22]

Additional Ways to Lower Blood Glucose

A few simple lifestyle changes improve the condition of people with type 2 diabetes, and sometimes eliminate the need to take medication.

5 Natural Ways to Lower Your Blood Sugar:

1. a low-carb breakfast no later than 1.5 hours after waking up - skipping breakfast suppresses the pancreatic beta cells that produce insulin;
2. staying hydrated – water thins the blood and helps the kidneys flush out excess glucose;
3. increased physical activity - daily walking and moderate exercise 2-3 times a week reduce the risk of stroke and heart disease, improve insulin sensitivity and promote the conversion of glucose into energy;
4. stress control - cortisol reduces sensitivity to your own insulin and to injections, so it is important to learn how to relieve stress in natural ways (walking, breathing practices, meditation);
5. Get at least 7-9 hours of sleep a night – Lack of sleep increases stress, releases cortisol, and raises hunger hormones, making it difficult to follow a healthy diet.

Low blood glucose can be life-threatening, while high blood glucose can be insidious and easier to ignore. It may take years before a person becomes aware of the disease. By then, latent diabetics have damaged the small blood vessels in the eyes, kidneys, heart, and nerves, contributing to complications such as vision problems, frequent urination, and nerve pain.

According to statistics, about 70% of people with prediabetes develop type 2 diabetes, so the disease has reached epidemic proportions among adults and children around the world.^[23] Fortunately, this transition is not inevitable—you can control your diet and lead an active lifestyle. It is easier to prevent this condition than to treat serious complications.

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food to lower blood sugar

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Abstract. The article considers the optimal level of sugar in human blood and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to reduce the level of sugar in the blood, the scientific basis of the nutrition of its lowering is considered.



Food to increase testosterone levels

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Abstract. The article discusses the optimal level of testosterone and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to increase testosterone levels, the scientific basis of nutrition for its increase is considered.

Keywords: testosterone, testosterone boost, healthy foods, recommendations

A slow decrease in the concentration of testosterone in the blood is a normal phenomenon in the aging process, called andropause or male menopause. But a constant diet, overeating and other factors reduce its production to critical levels. To avoid doctor trips and expensive treatments, you need to increase your intake of protein and healthy fats. Such measures will not only improve the hormonal background, but also slow down the aging process.

Low Testosterone: Symptoms and Health Risks

The hormone is synthesized in the testicles from cholesterol stores (in women, in the ovaries) and is produced in small amounts by the adrenal glands. Although cholesterol is the chemical base of androgen, consuming foods high in it is not conducive to hormonal health.

According to the latest data from the American Urological Association, testosterone levels for men are between 300 and 1000 ng/dL. It is important during puberty, for muscle building, fat distribution and plays a key role in sperm formation. The lower its level, the higher the likelihood of the following symptoms: fatigue, erection problems, low libido. Anemia, osteoporosis, hair loss, infertility, confusion, and depression develop less frequently. ^[1,2]

According to Mayo Clinic Laboratories, the normal testosterone level for women is 8–60 ng/dL. It is necessary for the creation of new blood cells, maintenance of other hormones, sex drive and fertility. Deficiency results in persistent fatigue, decreased sex drive, loss of bone density, irregular menstruation, and vaginal dryness. ^[3]

In men, the peak of testosterone production occurs at 18–19 years of age, and after 40 years of age, its synthesis decreases by 1–2% per year. ^[4] This can have negative consequences - studies show a link between low levels of the hormone and obesity, cardiovascular disease, and premature death. ^[5,6]

Causes of low testosterone

Almost 40% of men over 45 years of age experience androgen deficiency syndrome (hypogonadism). It is not aging that leads to it, but other factors:

- sedentary lifestyle;
- regular use of drugs;
- diabetes; ^[7]
- excess weight; ^[eight]
- chronic kidney and liver diseases.

Hormone replacement therapy with drugs is recommended only for men with severe clinical symptoms. It has many side effects - from acne to the growth of prostate adenoma. Changing lifestyle and nutrition is safe, unlike masculinizing injections.

Top 10 Testosterone Boosting Foods

1. Beef

Beef liver is an excellent source of vitamin D and ground beef is an excellent source of zinc. To get the best out of the products, you need to choose lean cuts of beef and not eat it every day, since excessive consumption of red meat causes certain types of cancer. ^[9]

2. Oily fish

Atlantic mackerel, herring, salmon, sardines, trout increase sperm quality and fertility of sperm due to their fatty acid profile. Fish is rich in omega-3s, meets your daily vitamin D needs, and is an excellent source of protein, creatine. ^[10, 11]

3. Oysters

Seafood contains more zinc per serving than any other food. The trace element is necessary during puberty, is important for sperm health and reproductive function. Zinc helps keep male hormones in check throughout adulthood, and its lack in the body can cause impotence. ^[12]

4. Extra virgin olive oil

The oil is rich in monounsaturated fats, antioxidants, vitamin E. The components improve male reproductive health - increase the level of luteinizing hormone, which stimulates testicular cells to produce testosterone. ^[13]

5. Domestic eggs

Egg yolk contains more nutrients than protein - it is an excellent source of vitamin D, carotenoids, amino acids, choline. A healthy person can eat no more than three eggs a day, and it is worth considering that one yolk can contain 60% of the daily cholesterol requirement.

6. Beans

Beans and some legumes (chickpeas, lentils) help those who suffer from erectile dysfunction. These are excellent sources of zinc, magnesium, as well as fiber and vegetable proteins. It can be stewed with vegetables, boiled and added to salads, or mashed to make pate.

7. Indian ginseng

A perennial plant in the nightshade family known as ashwagandha, winter cherry is a natural Viagra. An extract from it increases testosterone levels by 17%, and increases sperm count by 167%. The plant also lowers cortisol by 20-25%. ^[14, 15]

8. Ginger

Ginger root has a positive effect on male sexual energy - it increases hormone production by 17%, increases the chances of fatherhood. ^[16]

9. Pomegranate

Pomegranate juice has a positive effect on potency - it increases testosterone by 24%, protects the prostate gland from diseases and reduces the risk of cancer. It should not be drunk on an empty stomach, but only after a full meal - fructose harms beneficial microorganisms in the intestines. ^[17]

10. Leafy green vegetables

Spinach, cabbage are rich in magnesium - the second most concentrated mineral in the body. They improve the production of male hormone during a sedentary lifestyle. The effect is more obvious in the elderly and those with disabilities. ^[eighteen]

Science-Based Natural Ways to Boost Testosterone

Alcohol, peppermint, baked goods, sugar, trans fats, mega-6 in large quantities are things to avoid in order to maintain hormonal balance. If a blood test has already shown the presence of hypogonadism, you will have to change not only the diet, but the whole lifestyle:

- **Sport.** All exercises are effective, but strength training and high-intensity interval training are the most beneficial for men's health. Taking caffeine and creatine monohydrate as supplements in combination with a training program will improve performance. ^[19]
- **Minimum stress** . An increase in the stress hormone cortisol quickly lowers testosterone levels. Hormones work like a swing - when one rises, the other falls.
- **Vitamin and mineral supplements.** Deficiency of magnesium, zinc, vitamin D can be easily compensated with special supplements. In what forms to take them and at what time of the day, the nutritionist will tell you. ^[twenty]
- **Dream.** At least 7-10 hours of sleep per day is an important factor in health, as is proper nutrition. A five-hour rest is associated with a 15% drop in testosterone levels, while a three-hour rest results in borderline deficiency.
- **Avoidance of estrogen-like chemicals** . Minimize your daily exposure to BPA, parabens, and dangerous chemicals found in some plastics.

Androgen is critical to aspects of sexual health and body composition. It is easier to maintain its concentration regularly than to treat a deficiency with steroids. Key takeaway: Quitting alcohol, exercising, and increasing your protein and fiber intake can help you gain muscle mass, reduce body fat, and boost testosterone in just a few weeks.

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Food to increase testosterone levels

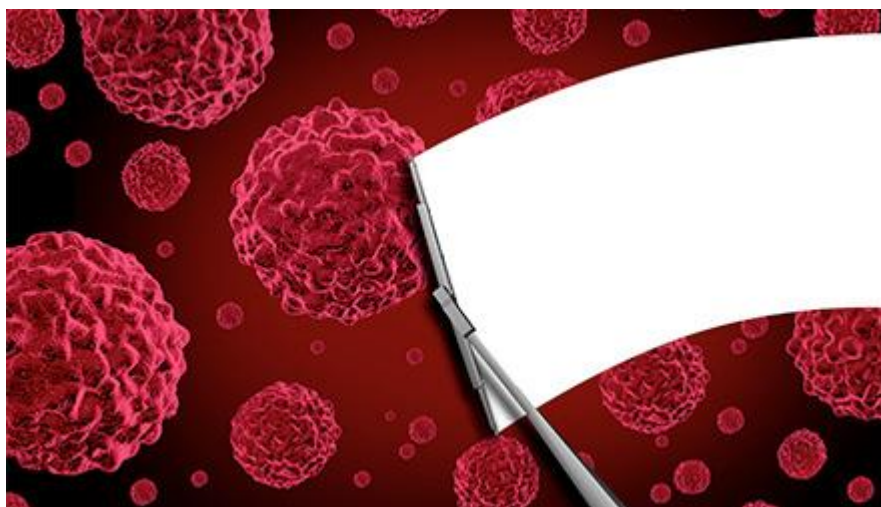
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Abstract. The article discusses the optimal level of testosterone and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to increase testosterone levels, the scientific basis of nutrition for its increase is considered.



Food to protect against cancer and fight cancer

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Abstract. The article considers the role of nutrition in oncological diseases. A systematic review of modern specialized literature and relevant scientific data was carried out. The food products for protection against cancer are indicated, the scientific basis of nutrition for the fight against oncology is considered.

Keywords: cancer, oncology, healthy foods, harmful foods, recommendations

Scientists and doctors cannot yet claim that any product prevents cancer or stops its development. But certain foods help to avoid malignant tumors and increase the chances of recovery. Let's take a closer look at the scientific data that testifies to the connection of food with cancer - foods and drinks that have anti-cancer properties and increase the risk of developing cancer cells. Rate the best and worst menu for your health!

The role of nutrition in the development of malignant tumors

Genetics and family history play an important role in the development of cancer, but 80-90% of them are associated with external factors. ^[1]One of the most important aspects of lifestyle is nutrition. A proper diet filled with colorful fruits and vegetables is the key to fighting cancer, heart disease, and diabetes.

Fruits and vegetables are low in calories, high in fiber, vitamins, and minerals—the more color on your plate, the more healthy. The antioxidants they contain protect against harmful compounds in food and the environment, and prevent cell damage and mutation.

Researchers advise focusing on eating dark green, red, orange vegetables and keeping a balance - the plate should be at least 2/3 plant foods and no more than 1/3 animal protein. According to the American Institute of Cancer Research, this diet helps fight cancer.

Foods that increase the risk of getting cancer

Any oncologist will recommend walking past the counter with processed meats - sausages, sausages, ham, bacon, corned beef, beef jerky, etc. Meat processing methods contribute to the formation of carcinogens. ^[2] The carcinogen acrylamide is also produced during frying of potatoes and other starchy vegetables. Acrylamide is dangerous because it damages DNA and causes cell death. ^[3]

No less dangerous is meat cooked at high temperatures. Grilling, barbecuing, frying in a pan - all this leads to the formation of carcinogenic PAHs and heterocyclic amines HCA. Stewing, baking in a slow cooker and oven at low temperatures is considered safe.

Dairy products - milk, cheese, yogurt - increase the IGF-1 protein associated with a high risk of prostate cancer. Research also links alcohol to tumors in the mouth, throat, larynx, esophagus, liver, breast, colon, and rectum. ^[4] Sugar and refined carbohydrates are even more dangerous. They cause inflammation, oxidative stress. In anti-rating:

- White rice,
- pasta,
- White bread,
- bakery products,
- all drinks, sauces, dishes with added sugar;
- sweet cereals. ^[5]

In addition, fast carbohydrates displace healthy foods that protect against oncology from the diet, and provoke obesity. The best junk food alternatives are fruits, vegetables, whole grains, fish, and lean meats. Although healthy foods alone cannot prevent disease, the right combination of them can make a difference.

Top 10 Foods Against Cancer

1. Broccoli

Asparagus, like all cruciferous vegetables, contains glucosinolates, which produce protective enzymes. Broccoli is the best source of the most effective enzyme sulforaphane. The compound promotes detoxification, attacks the H. Pylori bacteria, and reduces the size and number of cancer cells in the breast by up to 75%. For maximum benefit, steam kale, mix with garlic, olive oil, and consume 3-5 servings per week. ^[6]

2. Garlic

The bulbous plant also fights H. pylori and other bacteria associated with stomach cancer - it protects the stomach, pancreas, esophagus, and large intestine. WHO advises eating a clove of garlic daily. To get the best effect from it is simple - you need to peel, cut and leave for 15-20 minutes before cooking or eating. This will activate the enzymes and release the sulfur compounds that have the most protective effect. ^[7]

3. Carrot

Beta-carotene in carrots protects cell membranes from damage by toxins, slows down the growth of cancer cells in the cervix, chest, pharynx, larynx, esophagus, and stomach. The remaining components help fight HPV (human papillomavirus). Boiled carrots contain more antioxidants than raw ones. But it should be boiled, baked, or steamed whole, and sliced before serving to reduce nutrient loss. ^[eight]

4. Spinach

The king of leafy greens is effective due to folic acid, lutein, zeaxanthin, carotenoids. Ingredients neutralize free radicals, and folate helps the body repair DNA. Useful as raw spinach in salads, and boiled in soups, steamed, fried. ^[9]

5. Tomatoes

The red pigment associated with lycopene makes tomatoes a potential weapon against prostate cancer. The substance is also found in watermelon, pink grapefruit, red bell pepper. A powerful antioxidant boosts immunity, stops the growth of cancer cells in the lungs, breast, uterus. Raw and processed tomatoes are considered healthy. ^[ten]

6. Beans

The fiber and potent phytochemicals in beans protect against colorectal cancer and reduce the risk of tumor recurrence in a study of 1,905 people. Animal studies have shown that this type of legume blocks the development of cancer cells in the colon by up to 75%. ^[eleven]

7. Strawberry

Strawberries and raspberries contain vitamin C, ellagic acid. The latter activates enzymes that destroy carcinogens and slow down the growth of tumors in the urinary, esophagus, and chest. The flavonoids in the berries inhibit an enzyme that damages DNA and causes lung disease. Blackberries, blueberries, cranberries are also rich in flavonoids and deserve a place in your diet. ^[12]

8. Turmeric

The active ingredient curcumin has anti-inflammatory, antioxidant, anti-cancer effects. Testing on 44 patients with pre-cancer of the large intestine for a month showed that taking 4 grams of curcumin daily reduced the number of lesions by 40%. Researchers recommend consuming at least 1-3 teaspoons of ground turmeric per day, paired with black pepper or fats for better absorption of curcumin. ^[13]

9. Walnuts

All nuts have anti-cancer properties, but walnuts remain the most studied. They contain pedunculagin, which is converted into urolithins in the body. The compounds bind to estrogen receptors and prevent the growth of breast tumors. ^[fifteen]

10. Cinnamon

Cinnamon is well known for its health benefits, including the ability to lower blood sugar and reduce inflammation. Seasoning, extract and essential oil inhibit the growth of tumor cells, reduce their spread and cause death. ^[fourteen]

How else to protect yourself from cancer - other ways to prevent

In fact, the anti-cancer diet is not much different from the healthy diet recommended for all people. Some studies also support the benefits of grapes, anchovies and oily fish (salmon, mackerel, herring), whole grains, olive oil, citrus fruits, flaxseed. The influence of many products requires further study, because testing does not take into account other factors that play a large role in oncological diseases:

- excess weight - obesity and extra pounds contribute to the formation of cancer cells;
- insufficient water intake - slows down the elimination of toxins, contributes to the development of bladder cancer;
- smoking is the cause of 1/3 of all deaths from cancer; ^[one]
- the presence in the diet of improperly stored stocks of peanuts and other grains that release the highly toxic poison aflatoxin;
- long exposure to the sun - UV radiation causes premature skin aging, melanoma, basal cell and squamous cell carcinoma.

You can prevent many forms of cancer by quitting smoking, becoming more active, using sunscreen regularly, taking vitamins, and eating right. The American Institute for Cancer Research emphasizes that getting disease-fighting nutrients from foods is more effective than getting them from supplements.

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Food to protect against cancer and fight cancer

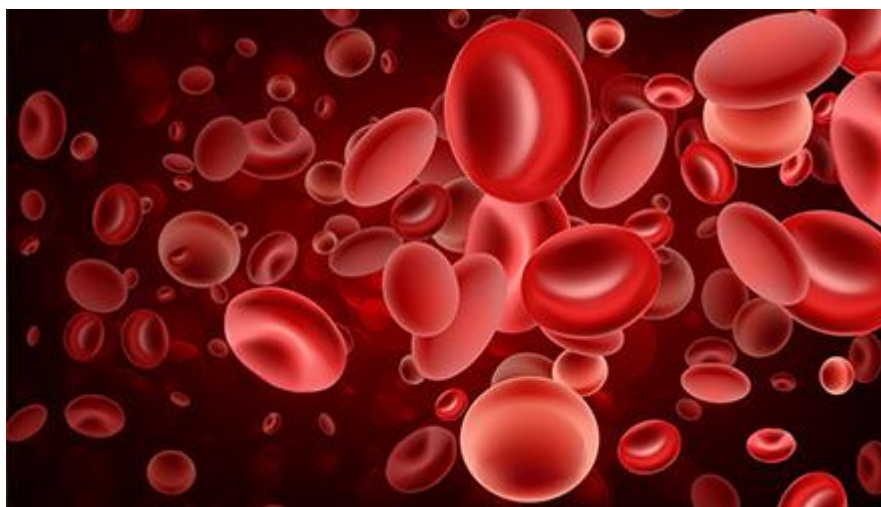
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Abstract. The article considers the role of nutrition in oncological diseases. A systematic review of modern specialized literature and relevant scientific data was carried out. The food products for protection against cancer are indicated, the scientific basis of nutrition for the fight against oncology is considered.



Food to increase hemoglobin

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Abstract. The article considers the optimal level of hemoglobin in the blood and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to increase the level of hemoglobin, the scientific basis of nutrition for its normalization is considered.

Keywords: hemoglobin, low hemoglobin, raise hemoglobin, iron deficiency, healthy foods, recommendations

Regular consumption of whole foods with iron, folic acid, vitamin B12 maintains and increases hemoglobin levels. But for good assimilation, substances need a favorable environment and special components. We understand what signs iron deficiency anemia has, and what foods help get rid of it.

What is iron deficiency - the main symptoms and causes

Iron is a trace mineral that comes from food. ^[1] It is part of hemoglobin, which, in turn, is found in red blood cells and carries oxygen from the lungs to all tissues and organs. The lack of a microelement in the body leads not only to oxygen starvation - it performs many other functions:

- participates in metabolism;

- responsible for the process of hematopoiesis;
- promotes the synthesis of thyroid hormones;
- takes part in the formation of immune cells.

Iron deficiency is often observed in pregnant women, when the need for a trace element is especially important - its low concentration in the blood provokes premature birth, hypoxia, and low weight in newborns.

Symptoms and signs of low hemoglobin in the blood:

- dizziness with a sharp rise;
- chronic fatigue;
- chilliness of hands and feet;
- dry skin;
- pigmentation;
- hair loss;
- lack of holes on the nails;
- shortness of breath, tachycardia during sports and in everyday life;
- taste perversion - the desire to eat clay, chalk (contrary to popular belief, this is not associated with calcium);
- zaidy;
- early gray hair.

Women are more likely to experience a problem due to menstruation, but there are many other causes of low hemoglobin: donation, peptic ulcer, parasitic infections, low stomach acid, liver problems, urinary tract infections, hypothyroidism, lack of iron in the diet. Often, the problem leads to a lack of cofactors in the body - substances that contribute to the penetration of the mineral into the cell:

- B vitamins (especially folic acid and B12), C, E;
- minerals - magnesium, copper, zinc. ^[2]

These useful components greatly simplify the fight against anemia, so you need to add foods with their maximum concentration to your daily diet.

What tests should be done with low hemoglobin?

Additional tests that help determine iron deficiency:

- ferritin;
- mean volume of erythrocytes (MCV);
- serum iron.

The main indicator for detecting iron deficiency is ferritin. Hemoglobin decreases after its reserves are reduced. Although levels above 50 mcg/l are considered normal for adults, weight should be taken into account in the calculations - approximately 1 mcg/l per 1 kg of body weight. A high ferritin level indicates the presence of inflammation in the body. Two markers allow to identify the inflammatory process - ESR and C-reactive protein.

It is imperative to increase hemoglobin in order to resist bacteria and viruses, normalize the menstrual cycle, and protect against stroke and heart attack. Foods can contain two types of iron:

- **heme** (bioavailability 30-40%) - in meat, offal, fish, shellfish;

- **non-heme** (5-10% digestibility) - in plant foods such as cereals, legumes, nuts, seeds.

To increase hemoglobin in the blood, you need to focus on heme iron in your diet. It is important to exclude from the diet everything that prevents its absorption and promotes excretion - coffee, tea, dairy products.

Top 12 Foods to Raise Hemoglobin

1. Beef liver

36% of the daily value of iron in 100 g

The offal contains 1049% vitamin A, which is necessary for the absorption of Fe. It is also one of the best sources of choline, a nutrient for brain and liver health. ^[3]

2 eggs

Egg yolks are especially rich in choline and iron. Their moderate consumption - up to three homemade eggs and two store eggs per day - does not harm healthy people, does not increase cholesterol levels. ^[four]

3. Oysters

17% in 100 g

Shellfish contain 24% of the daily value of vitamin C and 4.1% of B12. They are also an excellent source of the cofactor zinc at 27.5 mg. Substances help the immune system defend itself against viruses and bacteria, maintain the health of nerves and blood cells.

4. Beef

15% in 100 g

Iron deficiency is rare in red meat eaters. In one study, women who ate a serving of beef after aerobic exercise performed better than the supplement group. ^[5]

5. Broccoli

6% in 150 g

Cabbage contains 112% of vitamin C from the daily value. But what makes her the queen of cruciferous foods is folic acid, fiber, and the cancer-protective compounds indole, sulforaphane, glucosinolates. ^[6]

6. Spinach

15% in 100 g

Although the leaves contain non-heme iron, this deficiency is compensated by the high percentage of vitamin C, which increases the absorption of Fe. Consuming spinach with olive oil and other healthy fats helps the body absorb antioxidants and protect against cancer. ^[7]

7. Tofu

19% in 126 g

A soy product popular among vegetarians is an excellent source of thiamine, calcium, magnesium, and selenium. It also contains unique isoflavone compounds. They improve insulin sensitivity, reduce the risk of heart disease, and relieve menopausal symptoms. ^[8, 9]

8. Pumpkin seeds

14% in 28 g

Pumpkin seeds are full of nutrients. They not only increase hemoglobin, but also replenish magnesium and zinc, reducing the risk of diabetes and depression. ^[ten]

9. Tuna

8% in 85 g

Fish is high in niacin, selenium, B12, and omega-3 fatty acids, which promote brain health and boost immunity. Sardines and mackerel have the same rich composition. ^[eleven]

10. Asparagus

String green beans up to 11 mm in diameter contain more iron. This excellent source of antioxidants, flavonoids (quercetin, isorhamnetin, kaempferol), folic acid reduces the risk of chronic diseases and is especially useful during pregnancy. ^[12]

11. Quinoa

16% in 185 g

Pseudo-cereal is rich in protein and has higher antioxidant activity than other cereals available. ^[13]

12. Dark chocolate

19% in 28 g

Only real dark chocolate with a cocoa content of more than 45% is useful. The treat also contains prebiotic fiber, and its antioxidant activity is higher than that of blueberries and acai berries. ^[14, 15]

How to quickly increase hemoglobin with supplements - the safest and most effective dietary supplements

If the indicator in the analyzes is slightly lower, it is worth paying attention to the consumption of heme iron, increasing acidity and protein absorption. If the deficit is large, it is replenished with the help of nutraceuticals. It is important to take the mineral in the correct form in the evening on an empty stomach (at 17-18 hours) with cofactors. Usually, Fe is combined with vitamin C, and the need for other cofactors is checked by analysis. At the same time, the complex should not contain calcium, which slows down its absorption.

Iron comes in two forms, divalent and trivalent. Both species can form organic and inorganic compounds. The ideal form, which is absorbed by 70% regardless of acidity and rarely provokes side effects - organic ferrous salts. This group includes chelate forms, primarily bisglycinate and glycinate. To find them among pharmaceutical products, you should look for fumarate or ferrous gluconate in the composition.

Iron deficiency anemia is the most common type of anemia in the world. Its symptoms do not appear in everyone, so it is important to monitor the condition by regularly taking tests. It can be cured with the help of diet and nutraceuticals, which are best taken under the supervision of a nutritionist, nutritionist. The specialist will determine the safe dose of iron for low hemoglobin, select cofactors and tell you how to avoid side effects when taking nutritional supplements.

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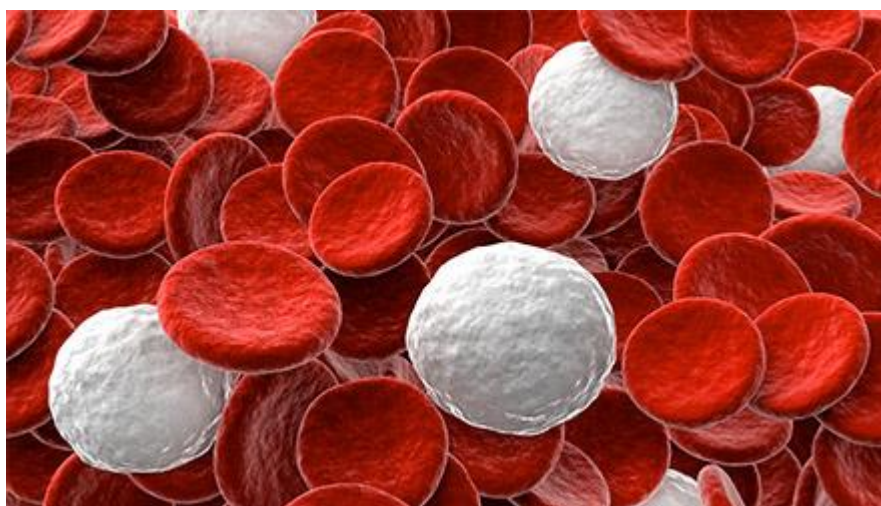
Food to increase hemoglobin

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Food to increase white blood cells

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Abstract. The article considers the optimal level of leukocytes in the blood and their impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. Food products are indicated to increase the level of leukocytes, the scientific basis of nutrition for its normalization is considered.

Keywords: white blood cells, white blood cell count, healthy foods, recommendations

White nucleated cells, leukocytes, are an integral part of the immune system. When their level is greatly reduced, the body becomes more susceptible to infections, inflammation, and oncology. If the indicator drops below 4 thousand / μl , you need to quickly increase the ratio - in the case of protective blood cells, time is of paramount importance. The sooner you work on a solution to the problem, the less damage to health will be.

What do white blood cells do - types and properties

Leukocytes make up about 1% of the blood and are divided into several subgroups. The most numerous subspecies are granulocytes. They are also divided into five types, and are displayed in the leukocyte formula of a blood test:

- **lymphocytes** (T-lymphocytes, B-lymphocytes, NK cells) - are involved in the production of antibodies;
- **eosinophils** - help with allergies, attack and destroy parasites, cancer cells;
- **basophils** - produce histamine during an allergic reaction;
- **neutrophils** - fight infection by killing and digesting bacteria, fungi;
- **monocytes** - help destroy bacteria.

Most of these cells are continuously produced in the bone marrow, and their life cycle is only 1–3 days. They move with the bloodstream and are constantly at war with infections, bacteria and any other foreign agents.

Low white blood cell count: causes, symptoms, ways to increase

A slight decrease in white blood cells can be the result of fatigue and stress. Usually the body solves this problem on its own after rest, diet changes. Leukopenia is also provoked by:

- viral infections;
- sarcoidosis;
- severe infectious diseases - tuberculosis, AIDS;
- autoimmune diseases - lupus, rheumatoid arthritis, etc.;
- congenital disorders - neutropenia, myelocathexis;
- oncology;
- some drugs - antibiotics, interferons, etc.;
- malnutrition and deficiency of B12, folic acid, copper, zinc;
- alcohol abuse.

Not every leukopenia is associated with these diseases and it is not always accompanied by fever, chills, sweating. One of the best ways to protect against it and get your score back on track is to eat a variety of whole foods and lead a healthy lifestyle. Proper nutrition in the right portions protects against many diseases!

Top 10 Foods to Boost White Blood Cells Naturally:

1. Yogurt

Probiotics in yogurt improve bowel function, stimulate the production of new immune cells. The same activity is shown by other products subject to bacterial fermentation - kombucha, kimchi, sauerkraut. [1,2]

2. Garlic

Garlic has immunomodulatory and anti-inflammatory properties due to the presence of alliin in the composition, which, when mechanically damaged - chewing, cutting - turns into allicin. The component stimulates the production of lymphocytes, eosinophils, macrophages. [3]

3. Spinach

A rich source of vitamins and minerals exhibits an antioxidant effect, helps to increase the number of leukocytes. Nutritionists recommend adding a small portion of cooked or raw spinach to your daily diet, unless there are contraindications. [four]

4. Broccoli

When chewing, digesting broccoli, a substance 3,3-diindolylmethane (DIM) is formed, which is capable of doubling the number of leukocytes. According to studies, DIM is well tolerated at a dose of 2 mg/kg per day. ½ cup of cruciferous contains about a tenth of this amount. ^[5]

5. Kiwi

Exotic fruit is a rich source of potassium and vitamins C, E. They play an important role in increasing the number of white blood cells, so it is advisable to eat 1-2 kiwis a day, and also add oranges, strawberries, lemons, grapefruits to the diet. ^[6]

6. Red bell pepper

Sweet pepper is rich in vitamin C, increases the production of antibodies and white blood cells to fight various infections. Best eaten raw in salads or with hummus. ^[7]

7. Mackerel

Fatty fish like mackerel, sardines, and salmon are the best sources of omega-3s. Polyunsaturated fatty acids increase the number of leukocytes and are excellent immunomodulators. To increase the intake of omega-3, you can also add walnuts, avocados to your daily diet. ^[eight]

8. Sunflower seeds

Phosphorus, magnesium, vitamin E and B6 - these nutrients and antioxidants in seeds increase the body's defense against harmful bacteria. They can be eaten on their own, and added to stewed vegetables, salads.

9. Green tea

Green tea is valued not only for antioxidants, flavonoids, catechins. It contains epigallocatechin gallate (EGCG), which is responsible for most of its health benefits. EGCG kills influenza viruses and is a powerful immune booster.

10. Ginger

Many test-tube and animal studies show that ginger enhances the immune response and has anti-tumor effects. The substance gingerol contained in the rhizomes is responsible for its burning taste and reduces inflammation. ^[9]

11. Asparagus

Asparagus is rich in vitamins A, C, E and amino acids. The latter saturate the bone marrow and white blood cells with nutrients for their production and proper functioning. The amino acid asparagine is especially beneficial for blood vessels and white blood cell production.

12. Oysters

100 g of oysters contain 554.9% of the daily requirement of zinc. The micronutrient helps the body produce more new white blood cells and increases the activity of existing ones. Other types of shellfish contain less zinc than oysters, but are also good sources. You can also get a trace element from red meat, legumes. ^[ten]

13. Brazil nuts

A medium Brazil nut contains 175% of the daily value of selenium needed for immunity. Its concentration in exotic fruits is so high that if consumed in excess, there is a risk of overdose. ^[eleven]

14. Wheat germ oil

In 1 st. l. wheat germ oil contains 135% of the daily requirement of vitamin E, without which the synthesis of the main immune agents is impossible. Wheat sprouts themselves, unlike carbohydrate grains, contain a lot of microelements and dietary fiber. ^[12]

15. Beets

A cheap and easily available vegetable contains the most essential substances for protection against oxidative stress and the synthesis of white blood cells - vitamin C, folic acid, manganese, iron, phytochemical compounds betacyanins. Beetroot is most useful in its raw form, but for diseases of the gastrointestinal tract, it is better to boil or bake it.

Other ways to prevent and treat leukopenia

If proper nutrition does not help raise the level of leukocytes in the blood, you can supplement the diet with food supplements with zinc, selenium, folic acid, omega-3, probiotics and vitamins C, E. To achieve results faster and avoid complications, nutritionists recommend taking additional measures:

- lose weight with excess weight, which will significantly improve immune protection;
- daily consume a norm of drinking water for the rapid removal of toxins;
- reduce the consumption of sugar and unhealthy fats, which will simplify the work of all systems and organs;
- get enough sleep, learn to cope with stress.

If you're looking for a way to prevent colds, flu, and other infections, change your diet first. Plan your diet to include 15 foods from our list that create a barrier to a variety of pathogens. A well-balanced diet rich in natural sources of vitamins and minerals will minimize potential health problems.

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