

Journal of Healthy Nutrition and Dietetics

In issue:



Chlorella



Broccoli



Coriander



Birch
juice



Green
coffee



Soybean
milk



Coconut
milk

- Aluminum (Al)
- Bor (V)
- Chlorine (Cl)
- Silicon (Si)
- Molybdenum (Mo)
- Nickel (Ni)
- Chrome (Cr)
- Cobalt (Co)



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Aluminum (Al) - importance for the body and health, where it is contained

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Abstract. The article discusses the main properties of aluminum (Al) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of aluminum are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of aluminum on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: aluminum , Al , aluminum, useful properties, contraindications, sources

It is one of the most common metals in the environment. Today, it is ubiquitous and its levels are increasing due to human influence on nature, which does not bode well for health. The neurotoxic agent can accumulate in the brain, provoke diseases and interfere with the absorption of other metals.

Aluminum in the body - good or bad

The trace element does not have an important function or role in the body, so its content in any part of the body is not considered the norm. Approximately 50% of the substance coming from outside is concentrated in the bone tissue, and 25% in the lungs (the percentage increases with age). A small concentration may be harmless, and the degree of absorption depends on the form and many factors: nutrition, the presence in the diet of such chelators as citric and lactic acid. ^[one]

With the blood flow, the element is transferred to the kidneys, which remove most of it. If their functions are reduced, the process deteriorates, leading to a toxic load. ^[2, 3]

Aluminum content analyzes

There are several ways to determine metal intoxication:

- bone biopsy;
- analysis of blood, urine.

If you have symptoms that indicate metal poisoning, your doctor may order a blood test. However, this indicator does not show the load on the organs - to confirm the diagnosis, it is necessary to check the bone marrow.

Aluminum in food and the environment

A person receives the toxin from different sources:

- vegetables, fruits, drinking water and processed foods (sausages, cheeses, etc.);
- food packaging;
- aluminum foil;
- kitchen utensils, baking sheets;
- cosmetics - antiperspirants, sunscreens, toothpaste;
- drugs - antacids for the treatment of acid-dependent diseases of the gastrointestinal tract, etc.

The metal gets into food in many ways, not just naturally from the soil. Levels may be higher due to the use of food additives (sulfates, phosphates, etc.), cooking in aluminum cookware, storage in aluminum-containing containers and cans. Most people are exposed to aluminum through additives that are considered harmless but pose potential dangers. ^[four]

As a result of soil acidification, the compound enters the aquatic environment, which leads to its accumulation in fish and marine plants. The level in drinking water is also rising - aluminum sulfate is added to it for purification. Scientists believe that human exposure to the substance is mainly food - drinking water accounts for less than 5% of oral intake. ^[5, 6]

Aluminum in products - what kind of food should be feared?

The highest metal content was found in vegetables, fish, seafood, root crops and tubers. The concentration in various types of fish, seafood, meat depends on the origin. Animals accumulate the mineral from the same sources as humans. ^[7, 8, 9, 10, 11]

The content of aluminum in vegetables and fruits depends on the variety, irrigation water and soil. The highest concentrations have been found in Spain in the Canary Islands, where the soil is acidic due to its volcanic nature. ^[13, 14, 15]

You may also not realize that some of the element gets into the food during cooking - it comes from foil, pans, pots and even cutlery. This is especially true for sour and spicy foods. ^[12]

The content of aluminum in products of plant and animal origin

No.	Product	mg/l, mg/kg in 100 g ± standard deviation
one	instant coffee	0.02–0.581
2	fruit juices	0.04–4.1
3	apple fresh	0.14
four	Pork	0.2

5	Yogurt	0.7±0.5
6	Milk	0.7±1.5
7	Ham	1.9±0.4
eight	Wine	2
9	Homogenized chicken eggs	2.9±2.9
ten	Bologna sausage, salami	3.06±1.09
eleven	Green beans, cooked	3.4
12	white fish	3.5±3.2
13	Cheddar cheese	3.9
fourteen	Fish, fatty varieties	3.9±1.9
fifteen	Citrus	4.7±3.3
16	Tomatoes and onions	5.4±2.1
17	Bird, rabbit	6.3±2.8
eighteen	Seaweed	7–27
19	red meat	9.3±4.8
twenty	Peaches, pears, plums	9.6±6.8
21	by-products	11.1±6.4
22	baked potatoes	26
23	Zucchini, carrots, courgettes, cabbage, watercress, spinach	27.4±38.4
24	processed cheese	29.7
25	Banana	32–33

The aluminum content in edible seaweed is higher than in fish - they can accumulate metals from the water and in some cases act as bioindicators of pollution. ^[16]

Safe daily dose of aluminum

WHO has established a safe daily dose of 40 mg/kg per day. Other organizations consider the average intake to be 10–15 mg/day. However, when taking drugs, the dose can reach 1 g / day, which is dangerous for health - even a healthy body finds it difficult to get rid of excess. ^[17, 18]

Interaction of aluminum with trace elements:

- [calcium](#) citrate and fluorine increase the absorption of the mineral from food, drinks;

- silicon and zinc reduce absorption. ^[24, 25]

How to reduce the absorption of aluminum?

Aluminum pots and other kitchen utensils oxidize, forming an inert layer that prevents metal from penetrating food. After cleaning the surface, the protective layer is erased, and aluminum can seep into the food. This is easy to avoid: you need to boil water in the dishes several times until the bottom becomes dull. After that, the containers will not look so shiny, but a little trick prevents leaching.

Aluminum foil is disposable and cannot be inert before use. In this case, the migration of the mineral into food may exceed the permissible limits. Therefore, baking food in foil is dangerous. For this, it is better to use baking paper. ^[26, 27]

The use of aluminum in medicine

Metal chloride is part of the drugs to stop capillary, gingival bleeding. Aluminum hydroxide is taken to treat stomach ulcers, and its forms are also added to vaccinations to increase their effectiveness. The risks associated with such vaccines are controversial.

Aluminum in scientific research

- The presence of the mineral in the daily diet can impair memory. Scientists have proven this with a 60-day low-dose study in rats. They added concentrations to food and water that reflected the average human intake of aluminum. Within two months, oxidative stress increased in all subjects, antioxidant protection decreased, memory and other cognitive functions were impaired. ^[28]
- Aluminum accelerates brain aging. It impairs speech, memory, the ability to recognize objects and make purposeful movements. It also contributes to the growth of certain age-related neurological diseases, such as Alzheimer's disease, Parkinson's. ^[29]
- The content of aluminum in drinks from aluminum cans is higher than from glass containers. In addition, the lower the pH of the content, the greater its concentration. Therefore, drinks from aluminum cans, especially soft drinks, can be a risk factor. ^[thirty]
- Foods baked in aluminum foil contain more metal. For fish, chicken, the maximum concentrations are 40–42 mg/kg. The leaching of Al into beef was slightly higher as it contains some organic acids that promote greater absorption. ^[31]
- The treatment of aluminum toxicosis includes several stages, and one of them is the intake of the chelating agent deferoxamine, based on succinic and acetic acid. After intravenous administration, the drug improves the condition of the bones and brain. Antioxidants and free radical scavengers such as selenium, melatonin, boric acid, vitamin C are also used. They reduce oxidative stress, and quercetin reduces the death of brain neurons. ^[32]

The harm of aluminum and its dangerous properties

- **Causes neurodegenerative diseases.** The main target of the component is the nervous system. Its high concentrations have been found in the brain tissues of patients with Alzheimer's disease. Scientists have come to the conclusion that this type of dementia appeared as a result of changing living conditions and is associated with industrialization. ^[19]
- **Dangerous for people with kidney failure.** If the kidneys do not work well, the element is not excreted and accumulates in the tissues. Studies have shown that this is often experienced by people diagnosed with kidney failure. ^[twenty]

- **Damages bones.** The metal is absorbed in the intestines and quickly transported to the bones, disrupting their mineralization, growth and activity of bone cells. Its toxic effects are cumulative and even intermittent or low-dose intake of the toxin increases the overall burden on the skeletal system. ^[21]
- **Reduces cognitive functions.** Studies have confirmed that workers in factories that come into contact with aluminum experience reduced mental function. The more metal and the longer its impact, the worse attention and memory. ^[22, 23]

The effect of aluminum on the body: consequences and complications

Side effects are associated with high metal levels, poor health. Consequences are determined by the number, duration and method of exposure.

Symptoms of excess aluminum

- confusion;
- muscle weakness;
- bone pain
- convulsions;
- speech problems;
- slow development in children;
- lung problems;
- problems with the nervous system - encephalopathy, cognitive and motor disorders;
- iron malabsorption, anemia;
- brain diseases;
- immune and allergic reactions.

Expert comment

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The metal belongs to substances of the 3rd hazard class. It is inevitably present in our diet, because it is most concentrated in vegetables, fruits, seafood. Its amount in food sources has increased so much in recent years that even its low absorption in the gastrointestinal tract does not save people.

That is why the metal poses a risk to the health of every person. Reducing its consumption is simple - just give up kitchen utensils with a harmful component, foil and highly processed food. Natural whole foods contain the least amount of not only aluminum, but also other dangerous compounds.

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Aluminum (Al) - importance for the body and health, where it is contained

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Boron (B) - importance for the body and health + 25 sources

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Abstract. The article considers the main properties of boron (B) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of boron are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of boron on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: boron , B, boron, useful properties, contraindications, sources

Boron is found in the environment, natural foods, and nutritional supplements. It is not classified as an essential nutrient for the body - scientists have not yet determined its main biological function. But experts acknowledge that it may be one of the most complex minerals on earth. Interest in it is gradually growing and more and more studies confirm its benefits for humans: it supports bone health, steroid hormone function, strengthens muscles and improves brain activity.

Boron functions in the body

In total, human organs and tissues contain approximately 20 mg of the mineral. Of these, 10 mg is concentrated in bone tissue, and the second half - in the thyroid gland, teeth, nails, kidneys, liver, muscles, adipose tissue. Most of the substance consumed is hydrolyzed in the gastrointestinal tract, but little is known about the absorption process. The body absorbs up to 90% of the component that comes with food.

The compound is excreted mainly with urine, partly with sweat and bile. The absence of changes in its level in the blood with an increase in consumption indicates a good maintenance of homeostasis due to an increase in excretion. But all stages of this process have not yet been determined. ^[1, 2, 3]

Every year, there is growing evidence that the nutrient has enormous benefits, ranging from anti-inflammatory effects to effects on various body systems. With additional intake improves immunity, the work of the central nervous system. Research also confirms the effect on metabolism of several enzymes and minerals. But the benefit is manifested only if the consumption does not exceed the allowable rate. ^[four]

Analyzes to determine the lack or excess of boron

Mineral status is not usually measured in clinical practice. Its level in the urine correlates with consumption, therefore, the concentration of the substance in the blood plasma on an empty stomach is checked. The test is usually done by people who are at risk of deficiency or excess while taking boron medications, supplements.

Boron in food - where it is contained and how it is absorbed

In nature, the mineral is not found in its pure form, but only in the forms of its salts (borates, polyborates), boric acid, aspartate, boron gluconate, calcium fructoborate and others. Scientists don't know which species are best absorbed, but their highest concentrations are found in plant foods. ^[5, 6]

Healthy foods with the highest boron content

Infants receive the mineral from breast milk and infant formula, adults from vegetables, fruits, and berries. The concentration in plant food depends on the composition of the soil in which it was grown. The more precipitation, the more borates are washed out of the earth. The maximum accumulations are found in arid regions. ^[7]

25 Plant and Animal Foods High in Boron ^[8]

No.	Product	mg / 100 g
one	Honey	0.5–6
2	Raisin	4.51
3	dried peaches	3.24
four	Almond	2.82
5	Hazelnut	2.77
6	Avocado	2.06
7	Peanut butter	1.92
eight	Prunes	1.88
9	Currant	1.74
ten	Red beans	1.4
eleven	figs	1.26
12	Dates	1.08
13	Lentils	0.74
fourteen	chickpeas	0.71
fifteen	Peach	0.52

16	grapes red	0.5
17	Plum	0.45
eighteen	Eggs	0.4
19	Dill	0.38
twenty	Red apple, pear	0.32
21	Broccoli	0.31
22	Carrot	0.3
23	Kiwi	0.26
24	Orange	0.25
25	Banana	0.16

The concentration of the compound in water varies depending on the source. The norm is the content of not more than 0.5 mg / l.

Daily intake of boron and the maximum allowable dose

There are no recommendations for the use of the substance per day, since science has not established its main biological role. Researchers believe that the average person receives 1-2 mg of the trace element per day. ^[9, 10]

The maximum safe dose of boron per day ^[11]

Life period	Age	Men and women (mg)
babies	0–12 months	Not installed
Children	1–3 years	3
Children	4–8 years	6
Children	9–13 years old	eleven
Teenagers	14–18 years old	17
adults	19+ years old	twenty

If the daily intake is less than 0.2 mg, a mineral deficiency develops, and if more than 13 mg, an excess develops. It is not recommended to take more than 20 mg per day, as this increases the risk of serious complications. The exact dosage when taking dietary supplements varies, but tests show that the optimal amount to increase testosterone levels is 6 mg once a day. Scientists claim that the effect will be noticeable within a week. ^[12]

Top 5 Health Benefits of Boron

1. Acts as an Antioxidant and Protects Against Cancer

The mineral can function as an antioxidant agent. Experiments in rats have shown that it reverses damage caused by oxidative stress after arsenic ingestion. Human studies have confirmed that it reduces the risk of cancer and DNA damage. Some studies show that insufficient intake increases the likelihood of developing prostate cancer in men and lung and cervical cancer in women. ^[13, 14, 15]

2. Regulates the body's natural production of testosterone and estradiol

The idea that boron helps with erectile dysfunction is based on its effect on free testosterone. If the problem has developed due to a hormonal imbalance (low testosterone, high estradiol, etc.), the mineral can help. Experiments have confirmed that taking 6 mg increases the level of free testosterone in men by almost 25% and almost halves the amount of estradiol. ^[16]

3. Reduces indicators of inflammation

Taking the supplement for 1–2 weeks reduces concentrations of inflammatory biomarkers. Indicators of interleukin and C-reactive proteins are reduced by more than half, which brings undeniable benefits - their excess production causes autoimmune reactions, tissue damage. ^[17]

4. Reduces Symptoms of Osteoarthritis

The component in the form of calcium fructoborate prevents and fights against chronic progressive bone disease. Observational data and results from several human studies show that the effect is achieved through the suppression of inflammation. Taking as little as 6 mg for two months reduces symptoms of osteoarthritis in the elderly. ^[18, 19, 20]

5. Improves Cognitive Function

People who receive 3.25 mg of the compound daily from their diets boast better memory and hand-eye coordination than people with low intakes of the mineral. Scientists have also confirmed that with its lack, short-term memory and manual dexterity deteriorate. ^[21]

The connection of boron with other minerals and vitamins

Numerous studies show that the mineral interacts with several beneficial substances and regulates their absorption. For example, a diet with a minimum content of an element of about - 0.25 mg per 2000 kcal - accelerates the excretion of magnesium and calcium in the urine. It also participates in the metabolism of phosphorus, increases the effectiveness of vitamin D. ^[22]

Boron tends to form complexes with vitamins B2 and B12, which reduces their absorption and increases urinary excretion. Therefore, separate intake of substances is recommended, unless the binding is intentional, as in the case of poisoning. ^[23]

The use of boron in medicine

Dietary supplements typically contain 0.15–6 mg of the mineral. Most of them are designed to improve the condition of bones and joints. The component is also used in radiation therapy, for irradiating tumor cells with heavy particles. ^[24]

Boric acid has bactericidal properties. It is traditionally used as a local astringent, a mild anti-infective agent - for the treatment of inflammation of the external ear canal, the treatment of damaged areas with

purulent skin infections. The antiseptic is toxic after excessive doses. There is evidence of a patient's death after accidental instillation of 30 g of boric acid.

Boron in scientific research

- In the 1990s, researchers found a positive relationship between boron intake and brain activity. The researchers assessed changes in cognitive function in response to dietary manipulation of the substance: they divided healthy older men and women into two groups who were given 0.25 and 3.25 mg of the mineral per day. In the group with a deficiency of the substance, the brain began to work as badly as with general malnutrition, heavy metal poisoning. [25]
- Taking calcium fructoborate twice a day for 2 weeks reduces knee discomfort in the elderly. The natural plant borate complex shows the greatest potential in the fight against joint pain. However, the inflammatory markers it targets and its mechanism of action are still unknown. [26]
- Scientists have found a link between boron consumption and prostate cancer - the mineral inhibits the growth of prostate tumors. They showed that men consuming about 6 mg/day had significantly smaller prostates than those consuming 0.64–0.88 mg/day. The lack of prophylactic and therapeutic agents is a short half-life, low bioavailability. [27]
- The reproductive toxicity of boric acid and borates is of concern to scientists. There is a linear relationship between the dose received and the concentration of compounds in the reproductive organs. In the environment, there are no such high indicators that could cause such an effect. High levels of exposure are possible in the workplace, in some countries due to the geological situation: China, Argentina, Turkey. [28, 29]

Side effects and toxicity of boron

Borates are safe for pregnant women if their amount does not exceed the established threshold. Effects when taken while breastfeeding have not been studied, so supplementation should be discussed with a physician.

Boron deficiency symptoms

The lack of a mineral in the body is associated with poor immunity, increased risk of mortality, osteoporosis. Deficiency has not been studied enough, since it is very rare, but doctors identify several signs:

- increased fatigue;
- developmental delay in children;
- tooth decay;
- fragility of bones, poor healing of fractures;
- pain in the joints;
- sexual dysfunction.

Signs of excess boron

The chemical element can be a potent toxin in large quantities. Fortunately, you cannot get an excess of it through food - there are no data on the side effects of high consumption with food or water. Overdose may be associated with accidental consumption, harmful work. High doses can be obtained in the production of glass, leather, cosmetics, soap, detergents, fuels, fire retardants. Areas near boron mines or factories may be at risk of soil and water contamination. [thirty]

Overdose symptoms:

- loss of appetite, nausea, vomiting, diarrhea;
- pain in the upper abdomen;
- dermatitis;
- headache;
- peeling of the skin.

At very high doses, renal failure develops. Extremely high doses are lethal. ^[31]

Interaction of boron with drugs

It is believed that the mineral does not have serious drug interactions. But experiments show that it enhances the effects of alcohol and can interact with hormonal medications to cause excess estrogen.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Naturally occurring boron is beneficial in small amounts and dangerous in large doses. Studies prove its role in the development of healthy bones and muscles, immune function, the formation of steroid hormones. To increase its consumption in a natural way without dietary supplements, it is enough to include prunes, raisins, dried apricots, avocados, nuts in the regular diet. People who follow a healthy diet should not worry about deficiency - the mineral is found in sufficient quantities in healthy whole foods.

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Boron (B) - importance for the body and health + 25 sources

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Chlorella: one of the best superfoods and the main competitor of spirulina

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

Keywords: chlorella, useful properties, contraindications, composition, calorie content

Chlorella is an emerald green freshwater algae. It was first studied after World War II as an alternative source of protein for the population. It is very similar in composition and properties to spirulina, but contains more vitamins and minerals. Here's everything you need to know about superfood, including research backing up its benefits and how to take the supplement.

The calorie content of chlorella is 250–400 kcal per 100 g, depending on the form of release (powder, tablets, etc.). The plant contains up to 70% complete protein by dry weight, which consists of all nine essential amino acids. Also, the product can be a good source of vitamin C, [B12](#) and iron - covering 6-40% of the daily requirement for the mineral. Like all algae, the supplement contains omega-3s and disease-fighting antioxidants. ^[1, 2, 3, 4]

Top 12 Health Benefits of Chlorella for Men and Women

1. Removes toxins

The rich composition reduces the toxicity of heavy metals to the brain, liver and kidneys. The components neutralize many highly toxic substances found in food. These include dioxin, which causes hormonal disorders. Also in one study, Chlorella fusca supplementation neutralized 90% of Bisphenol A (BPA) found in food from plastic utensils. ^[5, 6, 7, 8, 9]

2. Fights Chronic Disease, Oxidative Stress, and Reduces DNA Damage

Chlorella contains vitamin C, β -carotene, chlorophyll, lycopene and other antioxidants that reduce the production of advanced glycation end products (AGEs). The latter provoke inflammation, chronic diseases, complications of diabetes. Seaweed supplements increase antioxidant defenses in heavy smokers and in people at high risk of cancer. ^[10, 11, 12, 13, 14, 15]

3. Supports Liver Health

Supplements improve the condition of people with various liver diseases - they reduce the level of enzymes that harm the organ. But it's unclear whether they benefit healthy people. ^[16, 17]

4. Stimulates the immune system

When taking chlorella, more antibodies are produced in the body to fight foreign agents, and immune defenses in healthy people increase. However, one study found that supplementation mimics immunity in men and women aged 50–55, but does not help adults over 55. ^[18, 19, 20, 21]

5. Lowers Cholesterol

Taking the product in any form lowers bad cholesterol, triglycerides in people with high blood pressure. Scientists suggest that the condition improves a complex of beneficial compounds - fiber, antioxidants, vitamin B3. ^[22, 23, 24]

6. Normalizes blood pressure

Chlorella supplements protect the heart and kidneys, which play an important role in normalizing blood pressure. In addition, they reduce the stiffness of the arteries. The researchers suggest that nutrients such as omega-3s, potassium, calcium, and the amino acid arginine help protect arteries from hardening. [25, 26, 27]

7. Reduces blood glucose

Taking chlorella reduces blood sugar levels in men and women at high risk for diabetes and increases insulin sensitivity in liver disease. Scientists do not yet advise placing high hopes on dietary supplements and abandoning traditional treatment, but they believe that it is effective in combination with drugs. [28, 29, 30]

8. Accelerates recovery from respiratory diseases

Some components of superfood, including antioxidants, reduce inflammation in respiratory diseases, asthma. They improve antioxidant status in patients with chronic lung disease but do not improve respiratory capacity. [31, 32, 33]

9. Increases aerobic endurance

Chlorella increases the ability to resist fatigue during exercise, which is beneficial for athletes. This effect can be provided by branched chain amino acids, which improve performance, oxygen saturation of the lungs. [34, 35, 36]

10. Protects the eyes

Antioxidants such as lutein and zeaxanthin protect the eyes from strain and fatigue and reduce the risk of age-related macular degeneration. Lutein is one of the powerful carotenoids synthesized in plants with dark green leaves. It protects your eyes from harmful blue light emitted by digital devices such as smartphones, computers, etc. [37, 38, 39]

11. Reduces PMS Symptoms

According to anecdotal evidence, the plant relieves the symptoms of premenstrual syndrome (PMS). This conclusion was made by scientists studying the composition of algae. The main positive effect on women's health is provided by B vitamins and calcium. [40, 41]

12. Reduces the risk of anemia and edema in pregnant women

The iron, folic acid, and vitamin B12 found in the formula may lower high blood pressure and have other benefits during pregnancy. This was confirmed by studies conducted with the participation of 32 and 70 pregnant women. They had fewer signs of hypertension and were less likely to experience anemia. [42]

Why chlorella is dangerous: contraindications and risks associated with taking dietary supplements

For most people, algae does not pose a serious risk, but the characteristics of the organism and the disease should be taken into account:

- rarely provokes nausea, abdominal discomfort;
- affects the immune system and is not suitable while taking medications for the immune system;

- not compatible with blood products, as it contains a lot of iron.

Many nutritionists are also wary of taking supplements during pregnancy, although there is no evidence to indicate their danger.

How Much Chlorella Can You Drink Every Day - A Safe Daily Dose

The current scientific literature does not indicate the optimal dosage, as the nutrient content of algae is influenced by various factors, from growing conditions to processing. It is only important not to exceed the dose recommended by the manufacturer. It is better to start "therapy" with a minimum dose, gradually increasing it to the recommended one over 10 days. ^[43, 44]

Some studies have found benefits at 1.2 g/day, while others have looked at doses of 5–10 g/day. Most dietary supplements indicate a daily dose of 2-3 g/day for adults, which seems to be the most correct. It is also important to consider weight. For example, a child weighing 20 kg is allowed to take no more than 1 g of chlorella. As for tablets, the average daily intake for adults is 10-15 tablets per day, which corresponds to 2-5 g of powder.

How to choose and take chlorella?

Chlorella has a tough cell wall, making it difficult to digest in its natural form. Processing not only makes it easier to consume, but also makes the nutrients easily digestible.

Forms of chlorella:

- **Powder** . Can be added to avocado toast, smoothies, spaghetti, smoothies, orange juice, soups, vinaigrette, salad dressings, and even dips like guacamole or hummus.
- **Capsules and tablets** . This is the easiest form to use as it is easy to control and there is no risk of overdose.
- **Juices, bottled drinks** . In juices, smoothies and other drinks, the concentration of a beneficial ingredient is usually very low.

It is advisable to consume a superfood one hour before or after taking any medications. The daily dose can be divided into 2-3 doses during the day, if convenient. It is advisable to take tablets and capsules half an hour before meals with a large glass of water. Since the product is rich in bioabsorbable iron, you should not drink it with tea, which interferes with the absorption of iron.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

A nutritional dietary supplement can address some of the nutritional deficiencies commonly encountered by vegetarians and vegans. Scientific evidence also confirms that it is healthier than spirulina and better protects against inflammation, boosts immunity, and promotes detoxification. Before taking the supplement, it is advisable to consult with a specialist - a nutritionist will help you choose the right dose, a form that has been tested and is safe for health.

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Chlorella: one of the best superfoods and the main competitor of spirulina

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Broccoli Benefits: Top 10 Proven Health Benefits

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

Key words: broccoli , useful properties, contraindications, composition, calorie content

Whether you're looking to boost your immune system, protect your heart, improve gastrointestinal health, or reduce your risk of cancer, then broccoli is a great addition to your diet. Asparagus isn't always favored by taste buds, but it's so rich in antioxidants that it's worth the gastronomic sacrifice. It's time to find out what is actually contained in the vegetable and why it is recommended to eat it for various diseases.

The calorie content of raw broccoli is 34 kcal per 100 g. This is due to the fact that there are 90 g of water and 6.7 g of carbohydrates in a serving. A cup of low-calorie cabbage contains 69.4 mg of vitamin C, while the daily allowance for men and women is 90 and 75 mg. It also contains vitamins K and A, calcium, [potassium](#) , and the sulfur-rich compound sulforaphane. The substance is in the vegetable in an inactive form (glucoraphanin), and is activated when damaged - it must be cut, chopped or chewed.

Top 10 health benefits of broccoli

1. Helps Fight Cancer

Modern medicine fights cancer cells in many ways, but the potential of cruciferous plants in the fight against cancer should not be underestimated. This vegetable reduces the risk of lung, stomach, and colon cancer due to isothiocyanates that reduce inflammation. Chronic inflammation is dangerous because it causes changes in DNA and leads to cancer. ^[12]

2. Strengthens bones, joints, teeth

Vitamin K helps the body absorb calcium, so deficiency increases the risk of bone fractures. Broccoli contains both calcium and vitamin K, and also replenishes phosphorus, zinc, vitamins A and C. All substances are vital for strong bones, and sulforaphane also prevents the development of osteoarthritis. ^[3, 4]

3. Supports oral and dental health

In addition to the above nutrients that strengthen teeth, the vegetable contains kaempferol. Flavonoid prevents the development of periodontal disease, is part of herbal remedies for its treatment. Additional research shows that sulforaphane reduces the chance of getting oral cancer. Eating raw cabbage removes plaque, according to new data, but the information has not yet been scientifically confirmed. ^[5]

4. Reduces cholesterol

Broccoli lowers blood cholesterol levels due to its high content of fiber and other beneficial substances. According to tests, new varieties of a vegetable called Beneforte contain more glucoraphanin (sulforaphane). By consuming only 400 g of superfood per week, you can reduce the level of "bad" cholesterol by 6% and, in addition, reconfigure cellular metabolism, activate the protective functions of the body. ^[6]

5. Takes care of the heart

Since healthy cholesterol levels reduce the risk of heart disease, stroke, and high blood pressure, broccoli also promotes proper heart function. Antioxidants play an important role in reducing the likelihood of a heart attack. Broccoli sprouts have special ingredients. They protect heart tissue cells from death and oxidative stress after cardiac arrest. ^[7, 8]

6. Normalizes blood sugar levels and helps with diabetes

Daily consumption of broccoli sprouts helps diabetics control blood sugar levels, reduces insulin resistance. Animal studies have revealed another positive side effect - reduced damage to pancreatic cells. ^[9]

7. Increases immunity

Usually people try to get their daily vitamin C from citrus fruits, but broccoli also deserves attention. Cabbage contains a lot of ascorbic acid, the role of which is undeniable in maintaining the immune system - the ingredient gives the body the strength it needs to fight infections, promotes detoxification, and neutralizes free radicals. ^[ten]

8. Improves digestion and helps you lose weight

Fiber and antioxidants support the functioning of the intestines, increase the number of healthy bacteria in it. Therefore, a diet with broccoli helps to stay full longer and restrain overeating, reduces inflammation in the colon, relieves constipation. ^[11, 12]

9. Improves mental abilities

Bioactive compounds support the functions of the nervous tissue and brain. To fight the decline in mental abilities associated with aging, it is enough to eat just one serving of a vegetable per day. Scientists also suggest that broccoli improves the condition of patients after a stroke. ^[13]

10. Slows down aging and protects the skin from UV radiation

Aging, though inevitable, can be delayed and slowed down by protecting against oxidative stress. Diet plays a huge role in this process and studies show that sulforaphane slows down the aging process. The antioxidant also protects the skin from dangerous UV rays and related damage that can cause skin cancer. ^[14, 15]

Risks and alleged health harms of eating broccoli

You should be careful with the vegetable when taking blood thinners - it contains vitamin K, which contributes to blood clotting. Eating large amounts of asparagus every day will reduce the effectiveness of medications such as warfarin (Coumadin, Yantoven). Therefore, it is worth discussing your diet with your doctor.

How Much Broccoli Should You Eat to Get the Most Benefits?

Does the thought of consuming large amounts of cruciferous daily intimidate? We have good news for you - adults need to eat 2-2.5 cups of cooked vegetables per day to get the benefits. Asparagus can be part of this serving. You should not replace other products with green inflorescences - it is enough to combine them with your usual food.

How to Cook Broccoli and Eat Raw: Recipes and Cooking Tips

Cabbage can be boiled, fried, stewed, baked in the oven and microwave. But any heat treatment reduces the content of nutrients, especially vitamin C and protein. Steaming has the fewest negative effects, but eating raw broccoli is even healthier. To do this, use only the inflorescences (the stem is too fibrous), rinsing them with cold water and drying them with a paper towel. To enhance the taste, you can add hummus, yogurt-based sauce to them.

Before complaining that broccoli is tasteless, learn how to cook it. There are many tips that will allow you to cook it in different ways, and eat it with pleasure every day. The crown recipe is frying in olive oil with garlic and cheese. You can add the product to casseroles, soups and eat on its own with anything: salads, beef, chicken, pork, tofu, potatoes, rice and other side dishes.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Although the vegetable has many benefits, it is still not a panacea - there is no single food that guarantees good health. In addition to nutrition, the state of the body is influenced by other factors: lifestyle, genetics. Eating broccoli doesn't mean you'll never get sick, but adding it to your diet can play a huge role in disease prevention.

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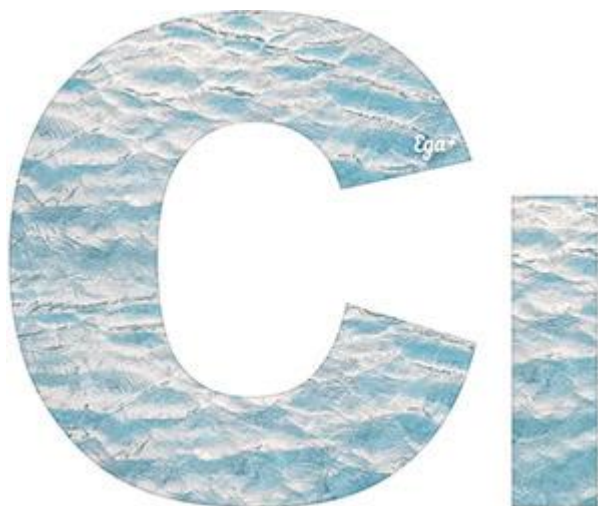
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Broccoli Benefits: Top 10 Proven Health Benefits

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Chlorine (Cl) - importance for the body and health, where it is contained

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Abstract. The article discusses the main properties of chlorine (Cl) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of chlorine are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of chlorine on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: chlorine , Cl , chlorine, useful properties, contraindications, sources

Chlorine is one of the main minerals required in relatively large amounts by the body. It has nothing to do with disinfectant and comes naturally from various foods, which mainly contain it as sodium chloride (salt), as well as potassium, calcium and magnesium. The chloride hidden in the shadow of sodium is less understood, but we need it to stay healthy. Does it have the same side effects? Let's get to the facts and research.

Functions of chlorine in the body

Chlorine (Cl) is present in all tissues and various organs: blood, bone tissue, body fluid, etc. Its main part (30–60%) is concentrated in the epithelium. In the body, it makes up 0.15% of the total mass, which is approximately 75–115 g of the substance.

The content of the component in the body depends on intake with food and excretion. It is primarily excreted through the kidneys, although 99.1% may be retained by the body, depending on its needs.

Doctors prescribe a test for the content of chlorine in the blood to detect diabetes insipidus, diseases of the kidneys and adrenal glands, as well as to monitor their condition during treatment. ^[one]

Chlorine in food - food sources

Chloride is naturally found in all unprocessed foods in small amounts. For example, unprocessed fish and meat can contain up to 4 mg per gram of food, while fruits and vegetables can contain 1 mg/g.

Chlorine is highest in processed foods, high- [sodium snack foods such as](#) nuts, chips, sauces, canned foods, pickles, hamburgers, cheeses, ketchups, salted fish, bacon, and ham. Table salt and sea salt contain 40% chloride, so you will consume it every time you salt your food. Salt substitutes also contain chloride - only sodium is to be replaced.

The daily rate of chlorine for the prevention of deficiency

How much chlorine the body needs per day depends only on age - the need is the same for men and women. The recommendations also do not change for pregnant and lactating women. Babies get the component from their mother's milk. ^[2, 3, 4, 5]

Consumption rates per day ^[6]

Life period	Age	Men, women (g/day)
babies	7–11 months	0.3
Children	1–3 years	1.7
Children	4–6 years	2.6
Teenagers	7–17 years old	3.1
adults	19+ years old	3.2

The minimum requirement for an adult in chlorine is about 0.8 g per day, of which more than 0.5 g is lost. The American Food and Nutrition Council recommends that an adult consume 2.3 g of chloride daily to compensate for the loss of salt through sweat. The need for a macronutrient increases in hot climates, with profuse sweating, increased water intake or strong physical exertion. ^[7, 8, 9, 10]

Daily consumption of the mineral is mainly associated with the consumption of sodium chloride - eating only 5–10 g of food salt (NaCl) per day, a person covers the need for this element in excess. According to the Institute of Medicine, the tolerable upper dose of chloride for adults is 3.6 grams per day. The Tolerable Upper Limit is the maximum level of daily intake that does not cause side effects.

Top 4 Benefits of Chlorine and Its Benefits for the Body

1. Maintains water and electrolyte balance

Chloride is one of the most important electrically charged minerals. The main anion (negatively charged ion) works with other electrolytes such as sodium and potassium to help balance acids and water in the body. If the level of chlorides decreases, it leads to diseases and dehydration. ^[11, 12]

2. Participates in the production and release of hydrochloric acid in the stomach, without which food cannot be properly digested and absorbed

Intestinal fluid plays a key role in creating the ideal environment for efficient digestion, nutrient absorption and defecation. Hydrochloric acid activates digestive enzymes, promotes the digestion of protein foods, has an antibacterial effect and stimulates the pancreas. ^[13, 14]

3. Conducts nerve impulses

Neurons transmit information through nerve impulses. The momentum transfer is chemical in nature, and chlorine takes part in a complex process. ^[fifteen]

4. Helps red blood cells to exchange oxygen, carbon dioxide in the lungs and other parts of the body

The surface of the lungs is formed by a continuous epithelium covered with a layer of fluid. The protective functions of the epithelium depend on the volume and viscosity of this layer - a violation of the fluid balance in our lungs is associated with serious diseases, such as cystic fibrosis. The transport of ions in the epithelium of other organs is also vital. ^[16, 17]

Interaction of chlorine with vitamins and minerals

There is a close relationship between sodium and chloride balance in the body - sodium chloride remains the main source of both electrolytes in the diet. Chloride also works with potassium and magnesium to help maintain fluid balance in the body.

The use of chlorine in medicine

Sodium chloride mixed with water forms a saline solution, which is used for various diseases:

- administered intravenously for dehydration, electrolyte imbalance;
- is prescribed for washing the nose - eliminating congestion, reducing postnasal leakage, maintaining the moisture of the mucous membrane;
- used to clean wounds;
- used for washing the catheter, dropper after the administration of the drug;
- used for inhalation alone and in combination with other medicines to moisturize and improve expectoration.

Chlorides in scientific research

1. Changes in serum chloride concentration independent of sodium and bicarbonate levels are associated with an increased risk of acute renal failure (AKI), morbidity and mortality. Avoiding chloride overdose is a reasonable treatment option for all patients, especially those at risk of developing AKI. Patients with developing AKI should receive balanced solutions rather than normal saline to minimize the risk of disease. ^[eighteen]
2. Chloride deficiency affects infants more often than older children and adults because these age groups consume salt. It also occurs from time to time in infants who are not fed traditional formulas, but home-cooked cereals. In the 1970s, it was proposed to reduce the salt content of baby foods as part of an effort to minimize the development of age-related hypertension, which caused outbreaks of chloride deficiency syndrome. ^[19]
3. Chloride content in fluids used in large volumes for resuscitation is associated with reduced survival. Among patients receiving more than 60 ml/kg in 24 hours, an increase in chloride

load was associated with significant adverse effects of survival up to one year, even after adjusting for baseline disease severity. However, the mechanisms responsible for these effects remain unclear. [twenty]

Contraindications and possible complications caused by chlorine

High or low blood chloride levels can indicate a variety of medical conditions such as metabolic disorders, kidney disease, heart failure, and certain respiratory conditions that can be life-threatening. Since excess salt is excreted in the urine, excessive intake of sodium chloride can damage the kidneys. Therefore, it is very important to maintain an optimal level of chlorides in the body.

Symptoms of chlorine deficiency - hypochloremia

Chloride deficiency usually does not occur in adults. This is unlikely if the diet contains processed foods that contain a lot of salt. Deficiency is associated with taking diuretics, gastric lavage and disorders of the body - from hormonal imbalance to food poisoning.

Chlorine deficiency symptoms:

- weakness, fatigue;
- poor appetite;
- increased drowsiness;
- memory problems;
- muscle weakness;
- persistent dry mouth. [21, 22]

Symptoms of excess chlorine - hyperchloremia

"Overdose" of chlorides is usually associated with high sodium intake, making it difficult to identify symptoms of overconsumption. Scientists believe that the consumption of both substances causes the same negative health effects:

- dehydration;
- acute renal failure (ARF);
- high blood pressure;
- diabetes insipidus - a violation of the water balance;
- adrenal hyperfunction. [23, 24, 25]

The interaction of chlorine with drugs

The effect of chlorine depends on which mineral it is combined with. For example, sodium chloride interacts with two drugs (lithium, tolvaptan), and potassium interacts with 139 drugs.

Expert comment

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Chloride is an important electrolyte (a mineral that conducts electricity in water). It accounts for two-thirds of all negative charges in the body and helps maintain normal blood pressure, acid-base balance, and oxygen transport. If you're worried that you're not getting enough of a macronutrient, then you need to eat a balanced diet. Have you been following our dietary guidelines? In this case, you are not threatened with a deficiency of chlorine and other nutrients.

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Chlorine (Cl) - importance for the body and health, where it is contained

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Coriander for health: what scientists say about the benefits and harms of seasoning

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

Key words: coriander , useful properties, contraindications, composition, calorie content

The seeds of the Chinese parsley *Coriandrum sativum* are called coriander, and the leaves are called cilantro. Cilantro seed powder is added to food because of the wonderful flavor it gives to curries, vegetables, pilaf, soups. But did you know that the seasoning is also good for immunity and digestion? You will be surprised to learn about its health benefits, which have been confirmed by scientists.

The calorie content of coriander is low - 298 kcal per 100 g. It is a rich source of dietary fiber, potassium, calcium, magnesium, phosphorus and vitamins K , [C](#). In addition , it contains a small amount of carotene and nicotinic acid. Substances provide its antioxidant and antibiotic properties. ^[one]

Top 5 Amazing Health Benefits of Coriander

1. Fights Infectious Diseases

The seasoning contains antimicrobial compounds that are effective in combating acute intestinal infections. For example, dodecenal helps the body fight salmonella. Other ingredients may help fight urinary tract infections (UTIs). ^[2, 3, 4, 5]

2. Lowers Blood Sugar and Prevents Diabetes

Animal studies have shown that cilantro seeds stimulate enzyme activity and lower blood sugar levels. People who take diabetes medication should be careful with the spice, as it can cause hypoglycemia in large doses. ^[6, 7]

3. Rich in immune-boosting antioxidants and anti-cancer effect

Coriander contains several antioxidants that prevent free radical damage to cells and fight inflammation in the body. Tocopherols, terpinene and quercetin have beneficial effects, which have anti-cancer, immunostimulatory and neuroprotective effects. One study also showed that antioxidants slow down the growth of lung, colon, and breast cancer cells. ^[8, 9, 10, 11]

4. Protects the skin

Antioxidants in coriander help with mild rashes such as dermatitis. They prevent damage to cells by UV radiation and early aging. The plant extract is used in combination with other beneficial natural ingredients for the treatment of diaper rash in infants, pigmentation, acne, increased dryness and oily skin. ^[12, 13, 14, 15]

5. Supports Heart Health

The plant extract has a diuretic effect - removes excess sodium, water and thereby reduces pressure. Some studies show that compounds in the seeds fight high levels of bad cholesterol. This is also confirmed by statistics - among the population that consumes large amounts of coriander, the rate of heart disease is lower. ^[16, 17, 18]

6. Promotes Digestion and Gut Health

The oil extracted from the seeds promotes healthy digestion, according to a study in people with irritable bowel syndrome (IBS). Patients reported a reduction in bloating, abdominal pain, and discomfort. Coriander is also used in alternative medicine as an appetite stimulant. ^[19, 20]

7. Protects the brain from damage

Multiple sclerosis, Parkinson's disease and many other brain diseases are associated with inflammation. Coriander extract has strong antioxidant properties and improves memory, protects nerve cells from damage after seizures caused by drugs. It also helps to cope with anxiety - almost as effective as medical drugs for anxiety. ^[21, 22, 23]

Coriander Contraindications - Precautions and Warnings

The spice is safe when taken in small amounts for most people, but in some cases, side effects may occur:

- insufficient reliable information about the safety of taking coriander by pregnant or breastfeeding;
- people allergic to dill, cumin, fennel, wormwood may suffer from allergic reactions;
- diabetics should carefully control their blood sugar when taking coriander;
- should be used with caution if you have low blood pressure or are taking medication to lower blood pressure.

The main symptoms of adverse reactions are asthma, swelling of the nose, urticaria or swelling in the mouth. These reactions are most common in people who work with the spice in the food industry.

How much coriander can you eat - daily allowance

Scientists have not identified the maximum allowable dose of coriander consumption per day. They recommend not overdoing the spice and adding it like salt in moderation.

Coriander ground and in grains: what is combined with and where to add

All parts of the *Coriandrum sativum* plant are edible but have different flavors. The seeds have an earthy flavor and the leaves are similar to citrus fruits, although to some people their taste is similar to soap. Whole grains are added to pastries, cereals, lentil soups, pickled and stewed vegetables. They release their flavor when heated, after which they can be ground, used in pastes and doughs.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Flavorful and rich in antioxidants, the seasoning is widely used in cooking and has many health benefits - improves heart health, brain health, gastrointestinal tract, skin and fights bacteria. Keep in

mind that many scientists use concentrated extracts of the plant during research, making it difficult to know how many seeds you need to eat to get the same benefits.

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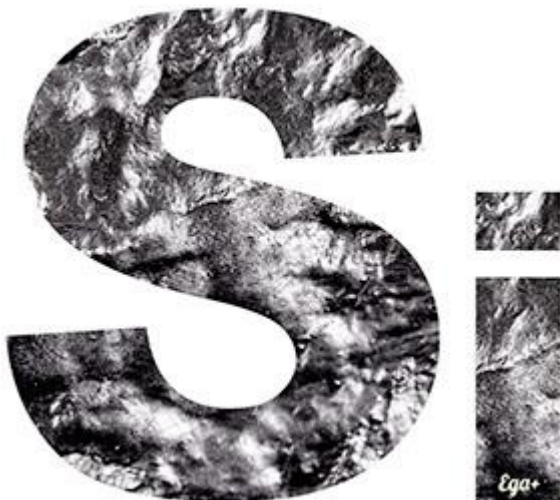
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Coriander for health: what scientists say about the benefits and harms of seasoning

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Silicon (Si) – Body & Health Importance + Top 20 Sources

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Abstract. The article discusses the main properties of silicon (Si) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of silicon are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of silicon on the human body under certain medical conditions and diseases are analyzed separately.

Key words: silicon , Si , silicon, useful properties, contraindications, sources

Silicon dioxide (Si) is rarely talked about as an important micronutrient for health. There is some controversy over whether the body needs it, but evidence is mounting in its favor. New research makes it clear that the mineral cannot be ignored - science has revealed seven of its benefits. The supplement has already proven its usefulness for weak bones (osteoporosis), gastrointestinal diseases and is successfully used to improve the quality of hair and skin.

Silicon in the body

The human body contains 7 g of silicon, which is not concentrated in any particular organ of the body - it is found mainly in connective tissues and skin. It is found in high concentrations in the connective tissues of tendons, bones, skin, hair, throat, and in large blood vessels such as the aorta. In lower concentrations, it is found in the liver, heart, and muscles.

The component is necessary for the synthesis of collagen and elastin. Collagen acts as a scaffold and provides support to the tissues, while elastin gives the tissues elasticity. Bone is a special type of connective tissue in which silicon regulates the accumulation of calcium and phosphorus.^[12]

The main route of excretion of the absorbed trace element is through the kidneys with urine. Therefore, with impaired renal function, its concentration in blood plasma increases significantly.

Silicon in food: availability and absorption

The electrolyte is non-toxic as an element and in all its natural forms. It almost never occurs in nature in a free form, but rather is associated with oxygen and is present in the form of silica, silicates. It comes from plant sources – plants use the mineral for strength and flexibility. They contain it in bioavailable forms that our body knows, recognizes and uses. [3]

However, our diet often lacks the micronutrient - we remove it from most foods and avoid many fresh fruits and vegetables. Processed foods, which are rich in the diet of modern people, do not contain it.

Processed food uses silicon dioxide as an additive. It is a natural chemical mixture of silicon and oxygen, which prevents products from caking or sticking together into lumps - protects against moisture, prevents powdered ingredients from sticking together.

Silicon in food - foods with a useful mineral

Plants absorb OSA from the soil and convert it into polymerized silica for support. This is why foods such as cereals, oats and vegetables are high in silicon.

Orthosilicic acid is the main component of silica found in drinking water and other liquids and is the most readily available source of silicon. It is easily absorbed and excreted from the body. More of the element is found in hard water than in soft water.

20 Foods and Drinks High in Silicon

No.	Products	mg per 100 g
one	Cereals	18.89±2.62
2	Dried fruits	10.54±5.44
3	Millet	7.96±0.71
four	breakfast cereal	7.79±6.31
5	Wheat	6.8±2.19
6	Barley	6.64±3.73
7	Khlebtsy	3.97±3.62
eight	Flour	2.87±1.60
9	Couscous	2.35±0.78
ten	Cornflakes	2.12±0.46
eleven	White bread	1.88±0.83
12	Rice	1.54±1.00
13	Wine	1.35±0.85
fourteen	Raw and canned fruits	1.34±1.30
fifteen	Buckwheat	1.17±0.59
16	Pasta	1.11±0.47
17	basmati rice	0.94±0.3
eighteen	tap water	0.37±0.13
19	Mineral and spring waters	0.55±0.33
twenty	fruit juices	0.38±0.53

The most important sources of silicon remain unrefined cereals. [4, 5, 6]

Silicon Consumption Norms

There is no strictly established recommended dietary allowance for silicon, as its primary biological role has not been established. Many nutritionists and nutritionists recommend that adults aged 19 to 50 consume 9–14 mg/day per day. In osteoporosis, the dosage may be increased to 40 mg.

For most Westerners, dietary silicon intake is often 20–50 mg/day. The highest intakes of 140–204 mg/day are found in China and India, where plant foods make up the majority of the diet. ^[7]

Benefits of Silicon Proven by Scientific Research

1. Strengthens bones

Men and women who get more silicon from food have higher bone mineral density and a lower risk of osteoporosis. However, the higher intake of silicon by older women after menopause does not bring the expected benefits - the mineral does not stop the destructive process. ^[8, 9]

2. Supports the health and beauty of the skin

Silicon increases the elasticity, strength of the skin and slows down their aging. It restores natural radiance and prevents wrinkles by increasing collagen formation. ^[ten]

3. Prevents brittle nails

The mineral plays an important role in maintaining nail health. It strengthens them, preventing the problem of brittleness, protects against infections, and provides nutrients to the nail bed. ^[eleven]

4. Prevents atherosclerosis

Silicon additives reduce the occurrence of atherosclerotic vascular lesions, reduce the formation of cholesterol plaques. The latter are responsible for the hardening of the arteries in atherosclerosis, which leads to a heart attack, stroke. The compound further increases calcium utilization by preventing calcium buildup in arteries such as the aorta. ^[12]

5. Restores the mucous membrane

The mineral plays a key role in protecting against many diseases associated with mucous membranes. It effectively restores the mucous membrane of the respiratory tract, if the body suffers from dehydration - it is found mainly in the connective tissue, where it acts as a "cross-linking" agent. ^[13]

6. Helps Alzheimer's

There is evidence that aluminum accumulation contributes to Alzheimer's disease, and silica contributes to its elimination. The trace element helps to get rid of the metal, which is too common in the environment, cosmetic products, food. ^[fourteen]

7. Flush out toxins and help cleanse the body

Silica gel effectively removes toxins, heavy metals and other waste from the body. This property allows it to be used in detoxification programs. To maximize the benefits for the digestive tract, it is important to eat a healthy diet and take vitamin supplements.

Interaction of silicon with minerals and vitamins

The mineral helps to get rid of excess aluminum in the body. It should also be borne in mind that its bioavailability decreases with the use of large amounts of calcium, magnesium. Scientists suggest that they compete for the same absorption pathway, or form insoluble compounds that reduce its

absorption. There are also suggestions that silicon dioxide controls the metabolism of calcium and magnesium. ^[15, 16, 17]

Silicon in medicine: where and what is it used for

The two main applications of silica-based materials in medicine and biotechnology are bone repair and drug delivery systems. They take micronutrient supplements for two reasons:

- with age, the level in the body decreases significantly, and deficiency leads to degenerative diseases of the gastrointestinal tract
- oats, barley, wheat, millet, potatoes and other foods contain adequate amounts of silicon, but they are refined to such an extent that they lose most of the beneficial compound.

Keep in mind that when taking dietary supplements, dosage is important. Before use, it is advisable to consult a nutritionist, nutritionist, and not blindly follow the recommendations on the label.

Scientific research on the benefits of silicon

- Higher amounts of aluminum are found in the affected areas of the brain in patients suffering from Alzheimer's disease. Silicon, binding to aluminum, prevents the absorption of the latter in the gastrointestinal tract and reduces its negative impact on the body. ^[eighteen]
- Silicon helps repair and maintain the tissues of the digestive tract. Studies have shown that collagen is produced in the smooth muscles of the intestine. Fibrillar protein is involved in the construction of new muscle cells for the healing of the gastric mucosa and intestinal walls. This prevents most gastrointestinal problems that develop due to mucosal degradation. Silicon also absorbs large amounts of toxins that slow down the digestive system, reverse food intolerances, and reduce flatulence. ^[19]
- Scientists have studied the intake of the mineral with food and found that it decreases with age. The mean silicon intake for men was 30–33 mg/day and 24–25 mg/day for women. The main sources of silicon for men were beer and bananas, for women - bananas, green beans. ^[twenty]
- Soluble orthosilicic acid may be important for growth, bone and connective tissue development. The substance is found in large quantities in beer. Its content was evaluated in 76 different beers, but no significant difference was found. In beer, silicon is present mainly in monomeric form, bioavailable. ^[21]
- Scientists confirm the role of silica in bone formation. The study involved 136 women who took supplements with calcium, vitamin D, silicon dioxide. After 12 months, the combination therapy had a beneficial effect on bone collagen compared with calcium and vitamin D alone. This suggests that silica, in combination with calcium and vitamin D, is potentially beneficial in osteoporosis. It can also be taken for broken bones to speed up their recovery. ^[22]
- A 2005 study confirmed that silica helps repair sun-damaged women's skin and slows down aging. In the women who participated in the experiment, the texture of the skin improved after a daily intake of 10 mg of silica. The positive effect of the substance is easy to explain - collagen production decreases with age, and silica is the key to creating collagen. Collagen maintains firmness, elasticity and reduces the appearance of fine lines and wrinkles. ^[23]

Silicon Contraindications

Silicon is safe in dietary quantities and no serious side effects have been identified by scientists. People who take silica-containing antacids for a long period of time sometimes develop kidney stones. The component is not recommended for pregnant and lactating women, as well as for those who have undergone an operation to remove the stomach (gastrectomy).

Silicon Deficiency Symptoms

Deficiency symptoms are obvious because they are closely related to connective tissues:

- weak bones;
- fragility of nails;
- thinning hair;
- early formation of wrinkles.

Lower stomach acid due to disease or aging reduces the ability to metabolize electrolyte from dietary sources, leading to electrolyte deficiency.

Symptoms of excess silicon

Adverse effects may be associated with crystalline silica - quartz dust. It can be inhaled for a long time by people who work in quarries and factories for its processing. This threatens with serious lung diseases - from COPD to cancer. ^[24, 25]

Interaction with drugs

Silicon does not interact with any medications. It is important for health, like other minerals - magnesium, potassium, calcium and iron.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

The best way to get the required amount of the mineral is to eat grains and vegetables. In some cases, when there are problems with its absorption, supplementation may be required. In such situations, it is important to seek the advice of a doctor - a dietitian or nutritionist - in order to prevent any unwanted complications.

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Silicon (Si) – Body & Health Importance + Top 20 Sources

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Birch sap - living water with unique benefits

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

Key words: birch sap , useful properties, contraindications, composition, calorie content

Natural birch sap is a dietary product donated by nature itself. It has been used in folk medicine for centuries to cleanse the body of toxins, uric acid and other harmful substances. Today, the drink is known as an alternative to sugary soda. But it not only helps reduce sugar intake, but also quenches thirst and replenishes mineral reserves, which is especially important when sweating heavily.

The calorie content of birch sap is very low and amounts to 8–25 kcal per 100 g. It contains little natural sweetener, and the composition as a whole does not differ much from mineral and well water. Nutrient content is influenced by various factors: geography, soil quality, age of the tree. As a rule, the drink contains a lot of magnesium, manganese and a small amount of vitamin C, [zinc](#), copper, phosphorus, potassium, folic acid. ^[12]

Top 7 Health Benefits of Birch Water: Should You Drink It?

1. Replenishes deficiency of vitamins and minerals

The sap is harvested in the spring, when the concentration of trace elements in the trees is maximum. Therefore, it contains many nutrients needed by the body. Sailors once drank superwater to protect against scurvy, and today people use it to support immunity and fight against the lack of useful components. All the benefits can only be enjoyed by consuming the seasonal treasure in moderation as part of a balanced diet. ^[3]

2. Supports Liver Health and Helps Eliminate Toxins

Birch sap promotes detoxification of the body. It neutralizes toxic waste products - neutralizes substances that are processed by the liver. This applies to both fats and alcohol, pesticides, and other hazardous components. Superdrink does not replace drugs in severe conditions, but can be used in combination with maintenance therapy and for the prevention of gastrointestinal diseases. ^[four]

3. Protects bones and the body from oxidative stress

A glass of diet drink contains 130% of the daily requirement of manganese. The mineral plays a huge role in maintaining bone health, reducing bone loss. It is especially useful in combination with copper and zinc, which are also found in the product. An additional benefit comes from superoxide dismutase, an antioxidant that reduces the risk of chronic diseases and cancer. ^[5, 6, 7, 8, 9]

4. Shows antioxidant properties

Birch sap contains vitamin C and polyphenolic antioxidants that protect cells from free radical damage and reduce the risk of age-related diseases. This primarily concerns osteoporosis, type 2 diabetes, cancer, heart disease, Alzheimer's and Parkinson's. The scientists also found betulin in the composition, a substance that the body converts into betulinic acid, known for its anti-inflammatory, anti-cancer properties. ^[10, 11, 12, 13]

5. Prevents the development of caries

The drink contains xylitol, a natural sugar substitute that is good for gums and mouth. Unlike sugar, it is not food for bacteria and does not have the side effects of other sweeteners. The natural component normalizes the acid-base balance, strengthens the enamel. ^[14, 15, 16]

6. Lowers Cholesterol

The drink contains saponins, which improve cholesterol metabolism. They bind to bile acids and remove them from the body. This prevents the reabsorption of cholesterol, increases its excretion. Thus, saponins deplete the reserves of the component in the body, protect against excess. ^[17]

7. Improves kidney health

The nourishing elixir removes and filters waste products through the urinary tract: excess salt, phosphate, uric acid, ammonia, certain drugs. It improves kidney function, helps to get rid of excess weight.

Birch sap: contraindications and harm

The product should be taken with caution if there is an allergy to birch pollen, liver dysfunction. For other people, it is safe in moderation. This is important because of the risk of excess and manganese poisoning. Young children are most at risk, who can exceed the daily allowance by drinking just one glass of juice. ^[18, 19]

The question remains whether contaminants get into the drink not only through open containers during collection, but also through the soil. However, many scientists do not see a reason for concern and believe that all pollution remains in the root system - only nutrients are absorbed into the tree.

How much birch sap can children and adults drink?

The clear liquid is only useful in limited quantities due to possible mineral overdose. It is enough for adults to drink three servings of a drink with a volume of 300 ml each day, and one such serving is enough for children.

How to extract and drink birch sap for maximum benefit?

Birch water is similar in properties to coconut water, but its taste is much milder. It is harvested once a year - for several weeks in early spring, when the trees retain the maximum amount of nutrients. To do this, you need to choose a birch with a spreading crown with a diameter of 20 cm, growing as far as possible from the road. From the tools you will need a container for harvesting, a groove or a tube, a sharp knife.

The hole is best made on the south side of the trunk at a height of 30–50 cm from the ground, since this is where the most active juice circulation occurs. An incision is made with a knife, moving from bottom to top. The depth can be 2-3 cm or more if the trunk is very thick. The final touch is the installation of the tube and the fixation of the jar. After collecting the drink, it is necessary to close the hole with plasticine, wax, moss.

Freshly collected water looks like a colorless liquid and has a slightly sweet taste. You can drink it fresh or fermented. The natural product is the most useful, because canned and commercially bottled may contain sugar, flavorings.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Birch sap is one of the most detoxifying and revitalizing drinks. Its nutritional profile and pleasant sweet taste appeal to all health conscious people. It improves immunity, accelerates recovery after sports, fights fatigue, spring weakness and lack of vitamins. The elixir of health is a great addition to a healthy diet, but do not forget that even birch water is good for the body in limited quantities.

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Birch sap - living water with unique benefits

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Green coffee: myths and truth from scientists

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

Key words: green coffee, useful properties, contraindications, composition, calorie content

Green coffee is whole or ground raw coffee beans. Their extract is very popular among people who seek to lose weight without difficulty. The concentrated food supplement is also taken for diabetes, high blood pressure, bacterial infections. Not all product benefits are scientifically proven, and some research is preliminary. Let's find out what benefits you can count on when using an invigorating drink and coffee dietary supplement.

The calorie content of 100 g of green coffee is approximately equal to 230 kcal. Unroasted grains are higher in caffeine and powerful antioxidants known as chlorogenic acids. There are not many vitamins in the dry product, but [calcium](#) and potassium are contained. ^[one]

Top 5 Health Benefits of Green Coffee

1. Has Antioxidant and Anti-Inflammatory Effects

Chronic inflammation is a key factor in many diseases, including cancer, arthritis, diabetes, and autoimmune diseases. Therefore, drinking a drink with antioxidants can be part of a healthy diet and positively affect organ function. ^[2, 3]

2. Reduces the risk of chronic diseases

Chlorogenic acids prevent the development of many chronic diseases and improve health with the wrong lifestyle. This was confirmed by a two-month study in which 50 people participated. In men and women, blood counts improved, and excess weight decreased compared to the control group. ^[4, 5]

3. Promotes weight loss

Taking an extract of unroasted coffee beans accelerates the loss of extra pounds during the diet. Researchers have found that the product affects the breakdown of fat in the body, helps control weight and lowers blood cholesterol levels in obese people. However, human studies are still considered insufficiently convincing - scientists note the potential and the need for new experiments. ^[6, 7, 8]

4. Prevents Type 2 Diabetes

Drink from grains and extract regulate the level of glucose, insulin in the blood. This helps to protect against type 2 diabetes and control the state of the disease. Scientists observed the best effect when using dietary supplements at a dose of 400 mg. ^[9]

5. Normalizes blood pressure

Raw coffee bean extract has a positive effect on blood vessels, supports heart health. Taking 400 mg for a month reduces systolic and diastolic blood pressure in people with hypertension. ^[ten]

Who should not drink green coffee - contraindications and harm

Green coffee, like regular coffee, contains caffeine, and therefore causes associated side effects:

- headache,
- insomnia
- anxiety
- stomach upset,
- nausea and vomiting,
- cardiopalmus.

Large doses of green coffee are dangerous to health. The main problems are related to caffeine, which is harmful in some cases:

- with an abnormally high level of homocysteine - chlorogenic acid further increases its concentration, which can lead to serious heart disease;

- with anxiety disorders - increases anxiety;
- exacerbates blood clotting disorders;
- changes the concentration of sugar in the blood, so diabetics need to take it with caution;
- worsens symptoms of irritable bowel syndrome (IBS);
- increases intraocular pressure, which is dangerous in glaucoma;
- can increase the amount of calcium leached out in the urine, thin the bones and lead to osteoporosis.

Do not take a green coffee supplement without your doctor's permission if you have a medical condition. It is not recommended for all children, pregnant and lactating women due to lack of safety evidence. Dietary supplements should also not be taken at the same time as other caffeine supplements, herbal stimulants, blood thinners, and medications to treat lung, depression, heart, and bone conditions. ^[11, 12]

How much green coffee can men and women drink?

Strict dosage recommendations do not exist as not enough research has been done on this subject. The daily dose with normal nutrition is 60-185 mg. In studies, 400 mg of the extract is used, which does not show negative effects.

The capsule may contain 20-50 mg of caffeine, but some products are cleared of the component. If you want to start taking any extract, talk to your doctor or nutritionist about it beforehand to find a safe form and dose.

How to drink green coffee: recipe

Dietary supplements contain a concentrated extract and are usually available in the form of tablets, capsules. The product can also be bought in the form of whole grains, from which a hot drink is prepared. You should be prepared for the fact that it will not look like the usual black coffee - its taste is so mild that it resembles herbal tea. But one cup allows you to instantly feel cheerful, energetic.

You can also brew a drink from ground green coffee beans by adding hot water to them, or brew from whole beans:

- soak overnight in water;
- the next day, pour water, bring to a boil and simmer for 15 minutes;
- strain and drink (leftovers can be stored in the refrigerator).

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Unroasted coffee plant beans and their extract have become famous as weight loss aids. Research on their effectiveness is limited, but there is evidence that supports reductions in blood glucose, weight, and blood pressure. Side effects of caffeine have also been reported. Therefore, before adding green coffee to your diet, you should consult with your doctor, nutritionist or nutritionist to make sure it is safe for your body.

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Green coffee: myths and truth from scientists

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Molybdenum (Mo) - value for the body and health, which contains

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Abstract. The article discusses the main properties of molybdenum (Mo) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of molybdenum are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of molybdenum on the human body under certain medical conditions and diseases are analyzed separately.

Key words: molybdenum , Mo , molybdenum, useful properties, contraindications, sources

Molybdenum is a useful mineral that you have hardly heard of. It is needed by the body in tiny amounts, but this is enough to participate in many vital processes. Without it, toxins accumulate in the body, amino acids are not absorbed, DNA is not processed. In this article, we break down why it's so important to health and tell you everything you need to know about the little-known trace element.

Molybdenum in the body: role and function

The substance is absorbed into the blood from the gastrointestinal tract (25-80%), and then transferred to the organs. The ability of the body to store it depends on the level of intake, the amount of copper and sulfates in the diet. The body stores a certain amount of the mineral in the form of molybdopterin in the liver, kidneys, adrenal glands, and bones. Its level is difficult to measure, since the presence in the blood and urine does not show the real situation - an excess of the mineral is excreted in the urine.
[one]

The trace element enters plant food from the soil and water with which it is irrigated. It enters the body of animals through plants, so the content of the compound in meat and offal depends on the diet. ^[2]

Experiments have shown that the element is poorly absorbed by humans from soy and other products. But this does not lead to its deficiency, since the micronutrient is present in other foods of plant and animal origin. ^[3, 4]

Molybdenum Foods to Add to Your Diet

There is not enough data on the presence of a microelement in plants, because its concentration depends on the quality of the soil on which they were grown. Although the quantity is variable, the richest sources still include offal, legumes, and grains. There are few minerals in fruits and vegetables.

15 Medium Foods Containing Molybdenum

No.	Product	µg per 100 g ^[5, 6, 7]
one	soy flour	314
2	Pea yellow	250
3	oats	180
four	Green pea	130
5	String beans, asparagus	60
6	Whole grain flour	58.5
7	Rice	29
eight	Bread	21
9	Cheese	eleven
ten	A pineapple	9
eleven	Eggs	9
12	Banana	eight
13	Potato	7
fourteen	Chicken meat	5
fifteen	Garlic	3

The concentration of the mineral in unfiltered water usually does not exceed 10 µg/l, although it can reach 68–200 µg/l in mining sites.

How much molybdenum does the body need - daily rate

The required amount depends on age and is calculated in micrograms.

Average daily recommended doses of molybdenum intake ^[8]

Life period	Age	Men, women (mcg)
babies	0–6 months	2
babies	7–12 months	3

Children	1–3 years	17
Children	4–8 years	22
Children	9–13 years old	34
Teenagers	14–18 years old	43
adults	19+	45

For pregnant and lactating women, the daily requirement increases to 50 micrograms. Most people get this amount of the compound from food. For example, women in the US average 76 mcg/day and men 109 mcg/day. These figures are well above the recommended dietary allowance for adults.^[9]

Information on the consumption of the mineral in other countries varies, but also usually exceeds the doses recommended by nutritionists. Daily upper limits depend on age. For example, for children 1-3 years of age, the maximum safe daily "serving" is 300 micrograms, for teenagers - 1700 micrograms, and for adults - 2000 micrograms.^[ten]

5 Health Benefits of Molybdenum for Kids and Adults

1. Acts as a Cofactor for Four Enzymes

The element is necessary for enzymes that are involved in redox reactions, the conversion of sulfites, the breakdown and elimination of toxins. Molybdenum activates enzymes such as sulfite oxidase, aldehyde oxidase, xanthine oxidase, mitochondrial amidoxime (mARC). The role of the mineral in the destruction of sulfites, which come from food products, is especially important. If they accumulate in the body and are not excreted in a timely manner, allergies, skin problems begin to develop, and the digestive tract is disturbed.^[11, 12, 13]

2. Protects against cancer, sclerosis and other diseases

The trace element removes excess copper from the body. This can play a huge role in the treatment of dangerous chronic diseases. Scientists consider it as a remedy for the treatment of hereditary Westphal-Wilson disease, oncology.^[14, 15, 16, 17, 18]

3. Protects cells from damage

The body naturally produces free radicals that are harmful to health. They reduce cellular function and lead to the complete destruction of cells. Antioxidants counter this process and prevent the accumulation of cells in aging, cancer, and other chronic diseases. Molybdenum is required to activate the antioxidant functions of some enzymes.^[19]

4. Eases Metabolic Diseases

The chemical element is responsible for a healthy metabolism - it starts chain reactions to produce energy. Therefore, foods with a mineral must be in the diet of every person.

5. Prevents tooth decay

The trace element is found in tooth enamel, so scientists decided to test its benefits on animals. Enamel treated with molybdenum fluoride showed accelerated cavity healing due to rapid mineral regeneration. ^[20, 21]

Interaction with vitamins and trace elements

Molybdenum supplements at a dosage of 500 mcg / day can provoke a deficiency of certain metals - the component displaces copper from body tissues. It also contains the enzyme xanthine oxidase, which promotes the mobilization of iron from reserves in the liver. ^[22]

Molybdenum in medicine

Food supplements contain molybdenum alone or together with other minerals. However, there is currently little evidence to support Mo. Such complexes may be needed for rare diseases and at certain stages of life (pregnancy, recovery from injuries, etc.). If you think you are not getting enough of a mineral from food, discuss this with your doctor or nutritionist, rather than taking supplements on your own.

It should be noted that the decay product of Mo-99, Tc-99m, is recognized as a working isotope in nuclear medicine for diagnostic imaging. It is used to detect diseases and to study the structure and function of organs. ^[23, 24]

Molybdenum in scientific research

- Scientists have found that esophageal cancer is associated with nutrition - the highest incidence has been recorded in countries and areas where there is a shortage of food. This primarily concerns China, Africa, the Middle East. In these regions, in addition to malnutrition, there is a lack of molybdenum and other substances in the soil. This contributes to the accumulation of nitrates and nitrites in plants, which convert them into nitrosamines - known carcinogens of the esophagus. ^[25]
- Previous studies have estimated the average daily dietary intake of molybdenum at about 300–400 mcg/day. To do this, the average food baskets of Americans were collected, their content was analyzed. However, new evidence suggests that the average intake is much lower - ranging from 120 to 240 mcg / day - and depends on age, gender, income. ^[26]
- Molybdenum deficiency due to long-term intravenous nutrition can provoke amino acid intolerance. During one study, a patient experienced hypersensitivity to L-methionine. Symptoms disappeared when the L-amino acid solutions were discontinued. The abnormalities indicated that a metabolic defect developed during the conversion of sulfite to sulfate. Supplementation with 300mcg/day of ammonium molybdate normalized uric acid production and solved the problem. ^[27]

Contraindications and risks associated with taking molybdenum

Molybdenum supplements are not approved by the FDA for medical use, although the potential for toxicity is low. The rules for admission are set by the manufacturers themselves, but this does not guarantee the safety or effectiveness of dietary supplements.

Molybdenum deficiency - deficiency symptoms

Deficiency of the element is rare, since it is found in many foods and is needed by the body in scanty amounts. People usually do not take it in the form of dietary supplements. The reason for this can only be diseases that do not allow the body to use the compound. Molybdenum deficiency leads to seizures,

cancer of the esophagus, brain damage, death within a few days of birth, and developmental delay. [28, 29, 30]

Excess molybdenum: symptoms, toxicity

Molybdenum from food and drink does not cause any harm. But taking it in large quantities does not give any advantages. Little is known about toxic effects in humans as research is limited. However, in animals, very high levels have been associated with diarrhea, kidney failure, growth retardation, and infertility.

People exposed to high concentrations of the substance (consumption 10–15 mg/day, industrial exposure) develop side effects:

- decreased bone mineral density; [31, 32, 33]
- accumulation of uric acid, development of gout;
- reproductive problems - a decrease in testosterone, sperm quality, fertility. [34, 35, 36]

Joint pain can also develop due to high levels of uric acid. [37, 38]

Interactions with drugs: when should you pay special attention to the intake of molybdenum?

The mineral does not interact with any drugs, does not interfere with their absorption. But when it comes to its consumption in the form of a supplement in large doses, you should definitely inform your doctor about this when prescribing any medication.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Molybdenum is a little-known but important trace element that can be obtained from legumes, grains, and offal. You don't need to supplement it as long as you follow a healthy diet. Studies show that even with a healthy diet, the average daily intake often exceeds the needs. Therefore, you should not worry about molybdenum, but about getting other vitamins and minerals.

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Molybdenum (Mo) - value for the body and health, which contains

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Nickel (Ni) - value for the body and health, where it contains

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Abstract. The article discusses the main properties of nickel (Ni) and its impact on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of nickel are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of nickel on the human body under certain medical conditions and diseases are analyzed separately.

Key words: nickel , Ni , nickel, useful properties, contraindications, sources

Nickel is not the most important mineral in the body, but without its participation, some bodily functions are impossible. It shares cellular receptors with cobalt, affects blood pressure levels, promotes iron absorption, and helps maintain bone health. Another micronutrient serves as a cofactor for specific enzymes. All the positive properties that we talk about below are confirmed by scientists.

Nickel content in the body

The micronutrient accumulates in the brain, stomach, liver, kidneys, lungs and heart. It is transported throughout the body by blood, mainly bound to albumin, and almost does not accumulate in organs and tissues. Most of the component is found in the adrenal glands and the thyroid gland. The body has enough trace amounts of the compound to perform all the necessary functions. ^[1, 2, 3, 4, 5]

Nickel in food - major animal and plant sources

The mineral occupies the 24th place in the world in terms of abundance and forms various compounds with other elements. Most of them are safe for humans, but some are toxic and even life-threatening.

The absorption of dietary nickel is very low. Food greatly impairs its absorption - absorption does not exceed 10%. Especially negatively this process is affected by tea, coffee, milk, orange juice and [vitamin C](#).

Nickel food

Men, women and children get the trace element from nuts, legumes, cereals, canned foods. In food groups, high concentrations are also found in sweeteners and chocolate. However, the main contribution to the consumption of the mineral is made by soups, multi-component dishes, and cereals. The concentration in food cooked in nickel cookware is slightly higher. ^[6, 7, 8, 9]

Nickel Consumption Rates – Striking a Balance

The human requirement for nickel is small and depends in part on the total energy requirement. According to the USDA, the US Department of Agriculture, the body may need as little as 25-35 micrograms of nickel per day.

Safe doses of nickel per day

Life period	Age	Men and women (mcg)
Children	1–3 years	0.2
Children	4–8 years	0.3
Children	9–13 years old	0.6
Teenagers and adults	14+ years	0.8–1

People unknowingly consume about 170 micrograms of nickel daily, which is slightly less than the mass of one grain of sand. For most adults, the safe dose is up to 1 mg/day. Higher concentrations increase the chance of side effects and may be toxic. ^[ten]

Top 3 Benefits of Nickel: Health Benefits and Role

1. Promotes the absorption of certain nutrients

Animal studies show that nickel helps the body use folic acid and vitamin B12. The compounds are very important for maintaining optimal levels of homocysteine, a toxic amino acid that has been linked to an increased risk of heart disease and stroke. ^[eleven]

2. Stimulates the secretion of hormones

Nickel concentration affects the synthesis of certain hormones. Among them are adrenaline, norepinephrine, aldosterone, and prolactin, which stimulates the production of breast milk. Aldosterone is important because it helps maintain blood pressure, regulates the water-salt balance. ^[12]

3. Improves Iron Absorption

Scientists have found that nickel deficiency worsens the status of iron in the body. It serves as a cofactor that facilitates the absorption, absorption, and metabolism of iron. ^[13]

Interaction of nickel with trace elements:

- helps the body use folic acid, vitamin B12;
- regulates iron absorption, calcium metabolism;

- is an antagonist of vitamin E - causes symptoms of its deficiency if accumulated in large quantities (possibly due to metabolic failure);
- prevents the absorption and accumulation of copper in tissues.

The use of nickel in medicine

Nickel-titanium alloys are widely used in dentistry, especially in endodontic root canal instruments. Nickel-containing materials are safe, hygienic and easy to clean.

Nickel research: scientific discoveries and scientists' conclusions

- In 2008, nickel received the title of "allergen of the year" - it became the most common cause of contact allergy in the world. The frequency of an allergic reaction to a mineral continues to rise. It cannot be explained by fashionable piercings or contact with nickel objects, which are widely used in medicine. The sources of allergy have changed as a result of industrialization and today systemic exposure is associated with food, water, surgical implants.^[fourteen]
- Tests have shown that when boiled, substances are washed out of kettles into water, especially if it is acidified with lemon. The amount of metals washed out depends on the type of kettle, contact time. Long-term exposure to elevated concentrations of pollutants leads to chronic diseases, increases the risk of poisoning.^[fifteen]
- *Helicobacter pylori* (*H. pylori*) infection is associated with gastritis, peptic ulcer disease, and adenocarcinoma. To resist the acidity of the gastric juice and continue to multiply in it, the bacterium uses an enzyme with minerals - the colonization of the body by the gastric pathogen *H. pylori* depends on the supply of nickel.^[16, 17, 18]
- The mineral can damage the organs of the endocrine system - the hypothalamus, pituitary gland - and lead to their dysfunction. It also affects hormone secretion and can cause oxidative stress, free radical release and DNA damage. However, there are few studies of the endocrine system and some data need additional confirmation.^[19]

Complications and adverse reactions associated with the use of nickel

People with kidney disease may have trouble absorbing the micronutrient. Its high concentrations also negatively affect bone tissue even in healthy people - they block bone mineralization.

Another negative effect of nickel is allergy. People with hypersensitivity to the component develop a rash after contact with nickel-containing jewelry, coins, stainless steel objects, surgical implants or dental appliances. Allergic reactions also develop when taken orally.^[20, 21, 22, 23, 24]

Nickel Deficiency: Risks and Symptoms

Scientists have not identified diseases that may be associated with a lack of a mineral - little is known about its deficiency in people, since we get a sufficient amount of the component from food and water. The researchers suggest that the deficiency may be associated with some negative effects:

- anemia due to iron deficiency;
- growth retardation;
- weak, brittle bones - osteoporosis;
- an increase in glucose levels.

Deficiency of the compound can contribute to the development of depression, liver disease.

More Isn't Always Better: Symptoms of Nickel Excess

There is no need to take the mineral in addition - it is enough in healthy food, and in large doses it is toxic. In several reports, scientists have documented the acute effects of high doses. In case of accidental ingestion of up to 2.5 g of nickel with water, people developed abdominal pain, diarrhea, nausea, vomiting, shortness of breath, and worsened blood counts. Excessive consumption contributes to the development of angina pectoris, asthma.

In hypersensitivity to the compound, oral exposure causes symptoms similar to contact dermatitis. An allergy to a mineral can occur after eating foods containing salts of nickel, cobalt or chromium. Overdose sometimes leads to a rare type of eczema - pompholyx. In this condition, itchy blisters form on the palms, fingers, soles. Therefore, it is advisable for allergy sufferers to avoid canned food and dishes cooked in nickel-plated dishes. [25, 26, 27]

Nickel drug interactions

Disulfiram, which is taken to treat alcoholism, reduces the absorption of nickel. No other drug effects were found.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

There are many important minerals, in addition to the two obvious ones iron and calcium, that help the body work more efficiently. Nickel is one of them. We need it in microdoses and some processes in the body depend on it. The good news is that if you eat a variety of fresh vegetables every day, then you are getting enough nickel from your diet and you don't need nickel supplements.

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Nickel (Ni) - value for the body and health, where it contains

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Soy milk: who can and should drink a lactose-free drink

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

Key words: soy milk , beneficial properties, contraindications, composition, calorie content

It is a healthy vegan product that was created as a waste product in the manufacture of tofu. It is made from soybeans, rich in isoflavones, so it does not contain lactose. The drink is not harmful to men, women, children and protects against many diseases. Comparing all types of plant milk, we can say that it is most similar to cow's milk in composition, but contains little fat.

The calorie content of soy milk on average ranges from 38–41 kcal. The exact nutritional value depends on the method of production (adding sugar, etc.). The natural drink is low in sugar and contains all nine essential amino acids. One cup provides an average of 2.7 micrograms of vitamin B12, which is more than the recommended 2.4 micrograms per day. Also, the drink is an excellent source of vitamin A, potassium, folate, choline. Many manufacturers enrich the product with [vitamin D](#), calcium, iodine. ^[12]

Top 5 benefits of soy milk and reasons to add it to your diet

1. Promotes brain function

Unfortified soy milk contains polyunsaturated and monounsaturated fatty acids. Useful components reduce the risk of developing dementia, Alzheimer's disease. The effect of the product on these diseases is still being studied, but soy is still considered one of the best plant sources of omega-3. ^[3]

2. Supports heart health

The non-dairy drink has a cardioprotective effect thanks to the right fats. The product helps to lower blood pressure, normalizes the pulse due to isoflavones, saponins, lecithin and potassium. Its use is associated with lower blood cholesterol levels. ^[4, 5, 6]

3. Reduces the symptoms of menopause, prevents menopausal syndrome

During menopause, estrogen production decreases, which increases the risk of cardiovascular disease, diabetes, and obesity. Women during this period are more prone to insomnia, depression, mood swings and other psychological disorders. Regular consumption of soy milk can help relieve postmenopausal symptoms as soy contains isoflavones known as phytoestrogens, which are estrogen substitutes. They reduce hot flashes and other unpleasant conditions. ^[7, 8, 9]

4. Protects Against Cancer

Several studies have confirmed the link between soy food consumption and cancer prevention. For example, a low incidence of cancer is observed in Asian countries, where soy is part of the regular diet. Scientists attributed this effect to the presence of the phenolic compound genistein. It acts as a chemotherapeutic component against various forms of cancer, blocks metastasis. Genistein is well combined with anticancer drugs and improves the effect of traditional therapy. ^[10, 11, 12]

5. Supports Bone Health

Osteoporosis is a disease associated with age and hormones. However, older women in Asia are less likely to suffer hip fractures than women in Europe. Researchers have found that consumption of soy-based products reduces the risk of fractures. The phytoestrogen contained in beans accelerates the absorption of calcium by the body, prevents bone loss, and has an antioxidant effect. Even more beneficial to the musculoskeletal system is soy milk, fortified with calcium and vitamin D. ^[13]

Is it safe to drink soy milk: contraindications and harm

Soy has gotten a bad rap, but the information that it increases the risk of cancer is not true. Rumors appeared after animal experiments: the consumption of high doses of isoflavones by rodents increased the likelihood of developing a breast tumor. However, representatives of the American Cancer Society explained and proved that rodents process soy differently than humans. In addition, they confirmed that eating soy at an early age reduces the risk of getting cancer. ^[fourteen]

Soy milk is dangerous in some cases:

- with an allergy to soy;
- with problems with the thyroid gland - it can interfere with the work of the organ.

In practice, the effect of soy isoflavones on the thyroid gland is minimal and in the presence of diseases, it is enough to minimize the consumption of soy in any form. Also, as long as you consume enough iodine, soy milk does not affect thyroid function. ^[fifteen]

Soy products contain oxalates, so people with oxalate kidney stones should avoid excessive consumption of soy products. However, studies show that they contain small amounts of oxalates, phytates and may be beneficial for such patients.

It is worth considering that phytates and trypsin inhibitors interfere with the absorption of nutrients from beans. Pre-soaking before cooking helps to get rid of them. If you still have concerns about a drink, talk to your doctor, registered dietitian, or nutritionist about them.

How much soy milk per day is safe to drink?

The American Institute for Cancer Research recommends a relatively moderate soy intake of up to three servings per day. For example, a day is enough to eat a dish of tofu and drink a cup of soy milk.

How to Make Soy Milk at Home: Easy Recipe and Nutrition Tips

A lactose-free drink can be found in grocery stores, restaurants. Not sure how to choose healthy soy milk? It is better to choose organic unsweetened versions fortified with vitamins and minerals. Unsweetened vanilla is ideal for adding flavor and aroma.

You can make your own soy milk at home:

- soak 1/2 cup beans in 2-3 cups of water overnight
- in the morning, drain the water and rinse thoroughly, removing the skin;
- combine soybeans and 4 cups of clean water in a blender bowl;
- beat the mixture with a blender and strain;
- boil the milk in a heavy-bottomed saucepan, keeping it simmering for 20 minutes and stirring frequently (an important step since soy should not be eaten raw);
- refrigerate liquid and store up to 4 days.

Soy milk can be used in any recipe other than regular cow milk: smoothies, milkshake, coffee, cereal, baked goods, béchamel sauce, etc. There is a slight difference in taste, but people get used to it quickly. It keeps for a long time at room temperature and eliminates waste caused by food spoilage.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

If you suffer from lactose intolerance, are concerned about the environment, or don't like the taste of regular lactose products, you can use soy milk as an alternative. It has many benefits - nutritional profile, antioxidant and anti-inflammatory properties. The drink is suitable for those who suffer from frequent candidiasis, skin rashes and want to get rid of obesity while maintaining muscle mass. It will be a worthy addition to any diet and will protect your heart.

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Soy milk: who can and should drink a lactose-free drink

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Chromium (Cr) - value for the body and health, where it contains

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Abstract. The article discusses the main properties of chromium (Cr) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of chromium are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of chromium on the human body under certain medical conditions and diseases are analyzed separately.

Keywords: chromium , Cr , chromium, useful properties, contraindications, sources

If you are familiar with beneficial minerals, then you have heard of chromium. The microelement is known for helping to maintain insulin sensitivity and absorb proteins, fats, carbohydrates. It enters the body with food and supplements, which are often presented in advertising as a means to lose weight,

reduce blood sugar levels. But not all marketing claims are backed by science. Do you want to know the truth about its benefits? Read on - we have collected evidence of its benefits and possible harm.

Chromium in the body

Our body uses the mineral in small amounts for essential functions such as digesting food. It is involved in the metabolism of essential nutrients, controls energy use, and enhances the action of insulin.

The body does not absorb and store chromium very well, absorbing only 1–2% from food. But it has a way of absorbing more of the micronutrient when needed—the smaller its reserves, the more efficiently it is absorbed from the gut. With age, there is inevitably a significant decrease in the level of the mineral in the body. The researchers also found that the average scores for men are significantly lower than those for women. ^[1, 2, 3]

Types of chromium and digestibility from food

Chromium exists in two main forms - the non-toxic trivalent and the carcinogenic hexavalent. The trivalent mineral is recognized as an essential nutrient and may have benefits in pharmacological amounts. Its deficiency does not cause irreversible anomalies and is easily eliminated without side effects due to the correct diet and supplements. ^[4, 5]

The stability and absorption of the nutrient varies, which affects the results of the study. For example, combining with starch does not improve absorption, as scientists expected, but block absorption. ^[6, 7]

Chromium Sources: High Foods

Chromium is widely available in food, but analysis of specific levels is unreliable. There are a large number of factors that affect its concentration: agricultural practices, the mineral composition of the soil, production processes. All this leads to large differences in the content of chromium in the same product. For example, its amount in oatmeal can decrease or increase by 50 times due to differences in cultivation, processing. ^[eight]

Scientists have found a lot of chromium in broccoli, liver, brewer's yeast. Its good sources are also:

- whole grains;
- high-fiber bran flakes;
- vegetables - potatoes, green beans;
- fruits - apples, bananas;
- beef, poultry;
- egg yolks;
- seafood;
- coffee.

Red wine may also contain the micronutrient.

recommended dose of chromium

Dietary reference values vary by age and gender. Nutritional supplements are non-toxic at recommended doses in the short term. ^[9]

Daily intake of chromium ^[10]

Life period	Age	Women (mcg)	Men (mcg)
babies	0–6 months	0.2	0.2
babies	7–12 months	5.5	5.5
Children	1–3 years	eleven	eleven
Children	4–8 years	fifteen	fifteen
Children	9–13 years old	21	25
Teenagers	14–18 years old	24	35
adults	19–50 years old	25	35
adults	51+ years old	twenty	thirty

The daily requirement for chromium increases during pregnancy and lactation - it rises to 30–45 mcg. Babies get it from mother's milk.

An upper tolerable intake level has not been established because there are few side effects associated with excess intake. According to the Institute of Medicine, the tolerable upper dose for adults is 3.6 g/day. But case reports describe kidney damage at doses of 1200–2400 mcg/day for four months.

Top 5 Health Benefits of Chromium

1. Supports Insulin Production and Controls Blood Sugar

In type 2 diabetes, the pancreas produces enough insulin, but muscle cells and other tissues become resistant to its action. This leads to poor blood glucose control. Chromium increases the sensitivity of cells to insulin to regulate blood sugar levels. The results of reviews and meta-analyses are conflicting, but people with insulin resistance should try increasing their intake of the micronutrient. ^[11, 12, 13, 14, 15]

2. Decreases heart rate in patients with impaired glucose tolerance

Chromium is involved in biochemical reactions, metabolic processes. Therefore, scientists have suggested that it can affect the functioning of the heart. Studies have confirmed that in patients treated with the mineral, the heart rate at rest, the level of cholesterol and triglycerides in the blood is significantly reduced. At the moment, the mechanism of these processes is unclear, but they are important for people with cardiovascular diseases. ^[16]

3. Reduces Inflammation

The intake of a mineral supplement reduces the level of c-reactive protein in the blood serum. The protein is produced in the liver during inflammation - it signals damage to tissues and organs. In healthy people, it is found in the blood in very small quantities. ^[17]

4. Reduces weight, insulin and free testosterone in PCOS patients

PCOS is the most common endocrine disease in women. Chromium, like some other minerals, improves the condition of the disease, increasing the chances of ovulation and regular menstruation.

Currently, there is not enough evidence to introduce the mineral as a drug for the treatment and prevention of PCOS, but this direction remains open. ^[18, 19, 20]

5. Normalizes appetite

The trace element is necessary for the body to break down nutrients. It reduces hunger, cravings for fatty foods and promotes weight loss. An eight-week study showed that chromium picolinate helped overweight adult women increase the gaps between meals. ^[21, 22]

Interaction of chromium with other minerals and vitamins

[Iron](#) overload in hereditary hemochromatosis is known to impair chromium transport. But vitamin C and B3 (niacin) improve its absorption in the digestive tract. Therefore, the consumption of foods high in ascorbic acid has a positive effect on the absorption of the trace element by the body.

The use of chromium in medicine

When not enough component is supplied with food, it is taken in the form of dietary supplements. The most effective form is picolinate. The supplements are popular among diabetics and people who are looking to lose weight or gain muscle mass. There is evidence of these properties, but doctors believe that there is not enough evidence yet.

Chromium in scientific research

- The diet strongly influences the loss of the mineral in the urine. With proper nutrition, 10% of the total amount of chromium supplied with food is excreted from the body. Diets with high sugar intake lead to large losses of the component - up to 100%. ^[23]
- Long-term and complete parenteral nutrition provokes a negative balance of chromium in the blood and hair - to a decrease in its concentration by more than 5 times. This leads to weight loss, the impossibility of its restoration due to intravenous administration of glucose. The addition of just 20 mcg/day of chromium normalizes glucose levels, weight and general condition. ^[24]
- Chromium picolinate promotes weight loss. Some studies have shown a moderate decrease in body weight when taking dietary supplements. This effect was especially pronounced in people who suffer from insulin resistance. But nutritional supplements did not improve body composition. ^[25]

Chromium contraindications and precautions

Renal failure can be considered as a relative contraindication to taking the mineral. But even if you have no reason to refuse a supplement, do not take it without the permission of a doctor, nutritionist, nutritionist.

Signs of chromium deficiency

Lack of the mineral is rare, even though it is poorly absorbed. Its losses increase with the consumption of large amounts of sugar, during pregnancy and lactation, intense physical exertion and stress due to infections, injuries. Deficiency is still more often observed with general malnutrition or acute illness. Theoretically, deficiency can impair glucose tolerance, blood sugar levels and contribute to the development of type 2 diabetes. ^[26, 27]

Symptoms of excess chromium

Side effects associated with a high intake of chromium from food or supplements are rare. The toxicity of trivalent chromium is low because it is poorly absorbed and rapidly excreted in the urine. However, caution should be exercised when taking high doses of any micronutrient. Supplements in large quantities can provoke:

- stomach problems, watery stools;
- dizziness and headaches;
- urticaria;
- low blood sugar.

Several case studies have found a link between nutrient excess and kidney and liver damage.

Interaction with drugs

The trace element disrupts the absorption of certain drugs, enhances their excretion. This primarily includes thyroid and acid reflux medications (proton pump inhibitors), as well as antacids, corticosteroids, beta-blockers, insulin, and some pain medications.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

After many years of research, the role of chromium in the body continues to be debated - its functions and benefits are not fully understood. It is only known that it is an important mineral for carbohydrate and lipid metabolism, the cardiovascular system and the fight against diabetes. Foods rich in it are not hard to find, but they are often not consumed regularly. Use the list above to plan your diet and make sure you meet your mineral needs.

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Chromium (Cr) - value for the body and health, where it contains

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Coconut milk is a superfood that works wonders for health

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

Key words: coconut milk , beneficial properties, contraindications, composition, calorie content

Coconut milk is extracted from the pulp of coconuts. It has a creamy texture, a light natural sweetness and many advantages over cow's milk. There is a lot of science behind this superfood hype, as scientists have proven its benefits in a vegetarian and any other diet. We tell you what the health benefits of the elixir are and how to drink it correctly.

The calorie content of coconut milk is high - depends on the method of preparation and varies from 190 to 230 kcal. It has unique proteins, but the drink is not considered the best source of protein. But it has no lactose and more fat than other milk substitutes - almost 93% of calories are fat. The product also provides the body with potassium, calcium, [magnesium](#), sodium and other electrolytes. It does not contain calcium, vitamins A and D, but it can be additionally enriched with them. ^[12]

Top 5 Health Benefits of Coconut Milk

1. Reduces stomach ulcers

Nutrient liquid reduces stomach ulcers by more than 50% - not inferior in effectiveness to anti-ulcer drugs. Experiments have shown that this is partly due to the anti-inflammatory properties of the drink and its positive effect on the mucous membrane. ^[3, 4]

2. Fights fungi and germs

The lactose-free product contains almost 50% fat - these are medium chain saturated fatty acids (MCFA). There is especially a lot of lauric acid in it, which, after entering the body, is converted into monolaurin. The antimicrobial, antifungal, and anti-inflammatory compound kills a wide range of disease-causing organisms. Thanks to him, the healing plant fluid protects the body from infectious and viral diseases. ^[5, 6, 7]

3. Helps the Cardiovascular System

The liver quickly converts fatty acids into energy, so fats do not accumulate, but are consumed by the body immediately after intake. This makes coconut useful - it does not negatively affect lipids, the balance of cholesterol in the blood. ^[8, 9, 10]

4. Improves Metabolism and Helps Lose Weight

MCT fats (Medium Chain Triglycerides), contained in coconut products, help to lose extra pounds, improve metabolism. They temporarily increase fat burning, reduce appetite and are not stored as fat, but are immediately converted into energy. ^[11, 12, 13, 14, 15, 16]

5. Eliminates oxidative stress and inflammation

Coconut-derived foods reduce swelling and inflammation in injured rodents. The fact is that coconut milk is rich in vitamins C and E, which are well known for their antioxidant properties and effectively neutralize harmful free radicals. Lauric acid additionally causes the death of cancer cells and inhibits tumor growth. ^[17, 18]

Disadvantages of coconut milk, possible harm and contraindications

The herbal drink brings great benefits, but, as with other products, it is important not to overdo it. Despite its name, coconut is not a nut - it is classified as a fruit, being a drupe with one seed. Therefore, people with nut allergies can consume it, and allergic reactions to coconut are extremely rare.

Grocery store coconut milk may contain carrageenan, a potential carcinogen that causes digestive problems in some people. It is also high in saturated fat, of which lauric acid is a representative. The reaction to it is different and does not always lead to a decrease in cholesterol - a lot depends on both individual characteristics and the amount of the product in the diet.

How much coconut milk can you drink: recommendations for every day, week

A nutritious drink has pros and cons, so it is advisable to consume it in moderation. Drinking 2-3 glasses a week is enough to get the benefits. Gastroenterologists, nutritionists and other doctors do not recommend people with irritable bowel syndrome to get involved in it and are advised to use no more than half a glass at a time.

How to drink coconut milk: exotic taste and benefits

Now that you know about the nutritional value of coconut, you will definitely want to add it to your diet. Thick drink is more often used in desserts, and liquid - in milk soups, sauces. It is very popular among vegans and often serves as the basis for ice cream, smoothies, smoothies, pancakes. It is added to coffee, protein shakes, pastries, fruit salads, cereals.

Unlike coconut water, which occurs naturally in the fruit, milk is made at home and on an industrial scale. It is easy to cook it yourself by adjusting the density to taste. You can make it at home: mix 1.5-2 cups of unsweetened coconut flakes with 4 cups of hot water and strain through a thin cloth, cheesecloth. For cooking, you can also use clean water and coconut pulp - combine in a blender and strain.

It is easier to buy ready-made coconut milk in the supermarket, but it may contain thickeners, sugar, flavorings. A few tips to help you choose the best drink:

- it is desirable that the composition contains two ingredients - coconut and water;
- give preference to products packaged in jars without bisphenol-A, a carcinogen dangerous to men, women and children; ^[19]
- choose lower calorie options and note that products in cartons contain fewer calories than canned products.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Coconut milk is advertised as a superfood and, despite its high fat content, protects against heart disease and obesity. This superfood is vegan, lactose-free, allergen-free, and highly nutritious, making it a favorite among athletes and people looking to lose weight. Drink it on its own at any time of the day or combine it with the usual dishes, drinks. It will be a useful addition to any diet and will boost your immunity.

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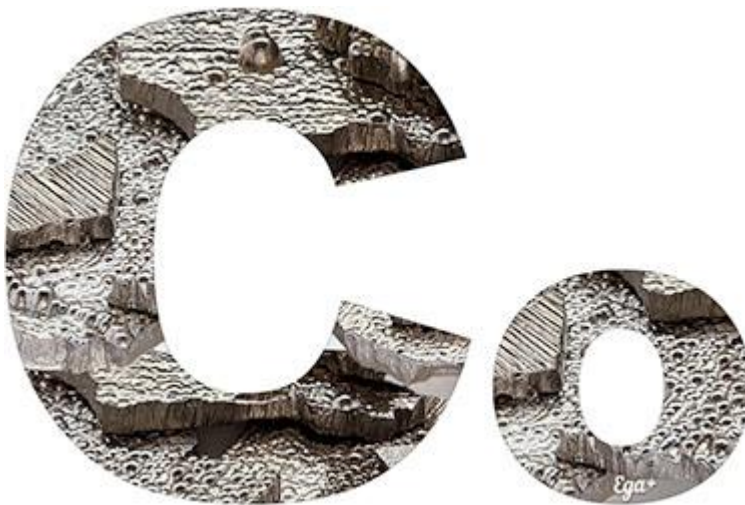
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Coconut milk is a superfood that works wonders for health

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Cobalt (Co) - importance for the body and health, where it contains

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Abstract. The article discusses the main properties of cobalt (Co) and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The best natural sources of cobalt are indicated . The use of the mineral in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of cobalt on the human body under certain medical conditions and diseases are analyzed separately.

Key words: cobalt , Co , cobalt, beneficial properties, contraindications, sources

Cobalt is an essential trace mineral and a component of vitamin B12. It is necessary for the formation of red blood cells, enzymatic reactions and the formation of nerve sheaths. The mineral strengthens the immune system, stimulates the activity of white blood cells to prevent infections. What foods are rich in trace elements and what are its benefits? Research and findings of scientists will surprise you.

Cobalt in the body: role and function

The component is needed in microdoses and no more than 2 mg is stored in the body of an adult. The main reserves are concentrated in the liver, but were also found in other organs of the gastrointestinal tract, kidneys. It is also part of the lymph nodes, hair. ^[one]

The mineral is part of vitamin B12. The latter performs several important tasks, including the creation of red blood cells. It performs the same functions as zinc and manganese and can replace them in some biochemical reactions. Cobalt is also part of the biotin-dependent Krebs cycle, the process the body uses to break down sugar and turn it into energy. ^[2, 3]

cobalt in food

The trace element is widely distributed in the environment. Its good food sources of cobalt are:

- fish;
- nuts;
- cereals;
- green leafy vegetables - broccoli, spinach, etc.

Cobalt is added to some beers as a stabilizer. Fans of such a drink have an increased risk of developing cobalt intoxication, which can lead to cardiomyopathy, heart failure.

Ground vegetables contain the mineral in small amounts. As the soil becomes more scarce, its levels decrease. This does not apply to soil near mining and smelting facilities, where concentrations of the compound are very high, with negative health effects.

Cobalt in Foods - Plant and Animal Sources

The trace element is mainly found in animal proteins. The concentration in vegetables depends on the amount in the soil in which they were grown.

15 products of animal and vegetable origin, the content of cobalt

No.	Product	Cobalt content ^[4] , mg/kg
one	Cheese	0.18
2	Chocolate	0.05
3	Crustaceans and molluscs	0.046
four	Dried fruits and nuts	0.041
5	by-products	0.033
6	Butter	0.018
7	Rice	0.01
eight	Fruit	0.009
9	Meat	0.008

ten	Fish	0.007
eleven	Bread	0.006
12	Vegetables (except potatoes)	0.006
13	Eggs	0.005
fourteen	Bird and game	0.002
fifteen	Milk	0.001

Products with a natural mineral help the body accumulate vitamins A, B3, C. ^[5]

Daily requirement for cobalt

The recommended daily allowance for a micronutrient has not yet been established and is currently determined by vitamin B12 requirements. For example, for most adults, it is desirable to consume 2.4 mcg of vitamin B12 daily, which corresponds to 0.1 mcg of the mineral.

To determine your micronutrient needs, it's worth talking to your doctor, dietitian, or nutritionist about it. It is especially important to carefully monitor its blood levels for athletes, people with anorexia or bulimia.

Nutritionists believe that the daily requirement does not exceed 0.1-2.4 micrograms per day. However, many adults consume much more of it - an average of 4 to 8 mcg per day. While maintaining vitamin B 12 in the body at the proper level, there is no need to take the mineral additionally. If your supplement contains 1.4 mg or less, it is unlikely to cause any harm. A dose of more than 30 mg is considered lethal. ^[6, 7]

5 health benefits of cobalt

1. Essential for Vitamin B12

The micronutrient plays the most important role for cobalamin. Vitamin B12 is not synthesized in the body, but only comes from outside. Many vegans and vegetarians do not get enough of it, so they may need cobalt supplements. ^[eight]

2. Protects Against Anemia and Maintains Healthy Blood

Cobalt can play a vital role in the absorption of iron - making it available for the formation of hemoglobin. Supplements with the component also help in the treatment of anemia when other methods are useless. ^[9]

3. Used to treat certain types of cancer

Medical cobalt-60 is used throughout the world to fight cancer and in radiation therapy to treat complex brain diseases. Radiocobalt allows doctors to deliver higher doses of radiation to tumors while limiting damage to surrounding healthy tissues and organs. For many brain cancers, this treatment remains one of the most accurate and advanced forms of radiation therapy available. ^[10, 11, 12]

4. Protects the nervous system

Cobalt is known for its ability to repair myelin sheaths, the layer that covers nerve cells and supports neurons. The trace element protects them from damage by free radicals. ^[13]

5. Heals wounds

Cobalt accelerates the healing of the skin after severe burns and injuries. It has even been shown to be beneficial in diabetic wounds where insufficient new blood vessel formation prevents healing. Nanofiber scaffolds solve this problem and help cells accumulate collagen and eliminate inflammation. ^[14, 15]

Interaction of cobalt with minerals and vitamins

- Cobalt is closely related to vitamin B12, scientifically referred to as cobalamin. The name itself suggests a connection with the mineral. The functioning of many organs and systems depends on the coordinated work of these substances.
- Cobalt goes well with ascorbic acid. With its participation, the absorption of vitamin C is significantly increased.

Application in medicine

Cobalt-60 is used in the healthcare industry to treat cancer and sterilize sutures, gloves, syringes and other medical equipment. Gamma sterilization guarantees the complete sterility of goods and saves on their production. This is especially true for implantable orthotics and heart valves, as metals and polymers are difficult to machine.

Cobalt-60 is used to sterilize insects that spread diseases such as the Zika virus and dengue fever. The method was first used on insects in the 1950s to prevent them from reproducing and taking root in the environment. Today, with the help of high-tech development, various carriers of infections in warm climates are neutralized. ^[16]

Cobalt in scientific research

- Some implants contain metal and release metal particles such as cobalt into the body. The compound may cause local or systemic toxicity including metallosis, hypersensitivity, benign tumour, cardiomyopathy, hypothyroidism and neurological disorders. Annual follow-up of implanted patients is recommended to monitor the potential toxicity of metal hip prostheses. The concentration of the mineral in the blood should not exceed 7 mcg / l. ^[17]
- Cobalt has special physical and chemical properties that can be used in drug development. Mineral complexes cause various biological effects - they suppress proteins, change the activity of drugs. ^[eighteen]
- The metal has a pronounced allergenic potential. Negative effects are associated with very large doses. Occupational health risk factors include asthma, interstitial lung disease, and alveolitis. In animal experiments, ingestion of cobalt led to reproductive changes, while injections with it led to cancer. ^[19, 20]
- Polyurethane dressing for wounds with the addition of cobalt nitrate fibers has the best physical and chemical parameters, parameters of compatibility with blood. Compatibility tests have shown longer clotting times and less toxicity. ^[21]
- The introduction of cobalt chloride to athletes is a type of doping, which consists in increasing the oxygen capacity of the blood. The trace element stimulates erythropoiesis - one of the processes of hematopoiesis, which consists in the production of red blood cells. It also helps tissues and cells adapt to low oxygen levels. The advantage of such additives is that they are

not prohibited and cannot be detected by anti-doping tests, but they are potentially hazardous to health.^[22]

Side Effects of Cobalt Use: Toxicity and Interactions

The International Agency for Research on Cancer classifies cobalt and its compounds as "possibly carcinogenic". This classification is based on the extreme intake of the substance by the animals during the study. There is no evidence of human carcinogenicity yet.

Since cobalt is a key part of vitamin B12, people with a rare eye condition such as Leber's syndrome should not take it without a doctor's approval. In these patients, some forms of vitamin B12 can cause vision loss. Pregnant and breastfeeding women should also not take supplements without a doctor's permission.

Poisoning is possible when large doses of an element that is of inorganic origin are ingested. Simply put, microdoses obtained from food are not capable of leading to an overdose.^[23, 24]

Cobalt deficiency - deficiency symptoms, consequences

If there is a deficiency of cobalt in the body, then there is a deficiency of B12 (and vice versa). The following symptoms may indicate a deficiency:

- numbness, weakness, tingling in the limbs;
- headache;
- nausea, poor appetite;
- bleeding gums, pale lips and tongue;
- memory problems, confusion.

Vegetarians are most at risk of deficiency of the component - it is not enough in plant foods.

Symptoms of excess cobalt

The trace element is toxic at doses of 20–30 mg/day. Excess is indicated by various symptoms:

- high production of red blood cells, thick blood;
- dysfunction and enlargement of the thyroid gland;
- violation of the activity of cells in the bone marrow;
- problems with the absorption of iodine;
- diseases of the respiratory system and heart.

Excess cobalt helps to remove sesame seeds, vegetables and fruits with pectin, as well as decoctions of oatmeal, rose hips.

Interaction with medications

There are no known food or drug interactions with cobalt. But the mineral is the core of vitamin B12 and is important for the formation of red blood cells, the functioning of the nervous system and DNA synthesis. Radioactive CO-60 also has many uses, one of which is radiation therapy.

Expert comment

Tatyana Eliseeva, nutritionist, nutritionist

Remember, the overall diet determines the risk of various diseases and protection against them. Instead of focusing on individual nutrients, it is better to eat a diet that is rich in all the essential nutrients for good health.

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Cobalt (Co) - importance for the body and health, where it contains

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