

The Importance of Minerals for the Human Body

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Abstract: Microelements - in small quantities in the body, fertilizers, ores (usually, the most important microelements affect the basic physiological and hygienic properties, participate in immune reactions, blood formation and tissue respiration, in animals, they decrease, they do not grow tall, the skeleton does not develop.

Keywords: development, plants, metabolism, processes, animal, normalization, macroelements, thyroid, beneficial.

Height growth and development of the organism helps, participates in blood formation, immune reactions and tissue respiration. Contains enzymes, accelerates the growth of birds and animals, if increased in cattle, molybdenosis disease appears. Strengthens teeth, helps blood formation and immune reactions, skeletal development, when it is increased, fluorosis appears. It participates in the process of blood formation, the activity of internal secretion glands; when it is not enough, the height of animals does not grow and the number of children is reduced. Certain macroelements in soil and rocks, water are M. for most animals, plants and humans.

In the body, M. includes various biologically active compounds: enzymes, vitamins, hormones and others. This effect of M. is mainly manifested in changes in the activity of metabolic processes in the body. Sometimes M. affects the growth of organisms, blood formation, respiration processes through tissues, metabolism of substances inside cells, etc. If there is too little or too much M. in the soil, there is a deficiency or excess of M. in the plant and animal organism.

To increase the productivity of cattle, M. is added to cattle feed. Food consisting of plant and animal products is the main source of M. entering the human body. Drinking water provides only 1-10% of the human body's daily need for M. such as iodine, copper, zinc, manganese, cobalt. M. is not distributed uniformly in the body. Their high accumulation in an organ depends on the physiological role of the element and the specific activity of this organ (for example, Zn accumulates a lot in the gonads and affects their function); in some cases, the influence of M. on the function of organs does not depend on the place of accumulation. The amount of most M. (Al, Ti, Cl, Pb, F, Sr, Ni) in the human body increases with age. During the period of growth and development, the amount of M. increases rapidly and decreases or stops when reaching 15-20 years of age. M. is divided into necessary (Co, Fe, Cu, Zn, Mn, I, F, Br) and less necessary (Al, Sr, Mo, Se, Ni) types, depending on whether it is important for the life of the organism.

All food products contain minerals. They are found in products as part of inorganic compounds. When food products are burned in special ovens, only mineral substances remain as ash. Therefore, the amount of mineral substances in food products is measured by the percentage of ash in them. Mineral substances are part of all tissues of the human body and make up 5% of its weight. Although minerals are required in small quantities (daily need 20-30 g), they perform very important tasks in the life process of the organism. They are part of all tissues and cells. Some mineral substances are part of enzymes, drugs, hormones and take an active part in the process of metabolism. In addition, mineral substances maintain the osmotic pressure in the tissues at the required level: they enter the bones and teeth and give them the necessary strength and hardness.[6] Depending on the amount of minerals in the body, they are divided into macroelements and microelements. Macroelements include calcium, potassium, magnesium, iron, sodium, phosphorus, chlorine. They are tens and hundreds of milligrams in 10 grams of tissue in the body. Calcium (Ca) is the main component of bone and muscle tissue. Calcium affects cell growth and blood clotting. It increases the activity of several enzymes and

hormones. Calcium deficiency in the body, especially in children, leads to improper bone development, tooth decay, and central nervous system dysfunction. The amount of calcium in the body is 1.5-2% of body weight, i.e. 1-1.5 kg. Calcium is abundant in milk and dairy products, cheese, and beans.

Potassium (K) participates in the normalization of the body's acid-alkaline balance, improves carbohydrate metabolism. Potassium salt ensures the release of fluid and sodium from the body, this property is used in the treatment of vascular and kidney diseases. Potassium is abundant in apricots, leaves, raisins, plums, beans, and turnips.[2] Magnesium (Mg) participates in the formation of bone tissue in the body, metabolism, increases the activity of enzymes, and improves the work of the heart. It improves the movement of the intestines, ensures the removal of cholesterol from the body. There is a lot of magnesium in bread, cereals, cereal products, and milk. Iron (Fe) is 3-4 g of iron in the body of adults, 73% of which is included in hemoglobin and is in the nucleus of cells. It participates in the process of complex oxidation and metabolism in the body, in the synthesis of enzymes. Anemia occurs when there is a lack of iron in the body. Iron is mainly found in liver, meat, eggs, peas, mash, vegetables, apples, grapes, and buckwheat groats. Sodium (Na) improves water exchange, ensures the removal of fluid from the body, participates in the formation of osmotic pressure in tissues. It is mainly derived from table salt (NaCl). Phosphorus (P) is the main component of bone and muscle tissue, which is 0.8-1.1% of the total body weight, i.e. 600-700 g. Phosphorus participates in all life processes in the body. It is of great importance in improving metabolism, absorption of substances into cells. Phosphorus compounds have a good effect on the central nervous system when doing mental work. Phosphorus is abundant in cheese, fish caviar, eggs, meat, fish, bread, cereals, milk and dairy products, cereal products. Phosphorus intake and cancer risk: In a 47,885-year follow-up of 24 men based on an analysis of registered dietary data, high phosphorus intake was associated with a higher risk of prostate cancer. (Wilson KM et al, *Am J Clin Nutr.*, 2015) Another large population study in Sweden found an increased risk of cancer with increased phosphate intake. Men had a higher risk of pancreatic, lung, thyroid, and bone cancers, while women had a higher risk of esophageal, lung, and non-melanoma skin cancers. (Wulaningsih V et al, *BMC Cancer*, 2013). The anticancer effect of Zn is mainly due to its antioxidant and anti-inflammatory properties. (Wessels I et al, *Nutrients*, 2017; Skrajnowska D et al, *Nutrients*, 2019) Below are numerous studies that have reported an association of zinc deficiency (due to low intake of zinc-rich foods) with increased cancer risk. there is. A case-controlled study of the European Prospective Investigation into Cancer and Nutrition Cohort found that increased levels of the mineral Zinc were associated with a reduced risk of developing liver cancer (hepatocellular carcinoma). They found that zinc levels were not associated with biliary tract and gallbladder cancer. (Stepien M et al, *Br J Cancer*, 2017). A significant decrease in serum zinc was observed in newly diagnosed breast cancer patients compared to healthy volunteers.

In an Iranian cohort, they found a significant decrease in serum zinc in colorectal cancer patients compared to healthy controls. (Khoshdel Z et al, *Biol. Trace Elem. Res.*, 2015) A meta-analysis reported significantly lower serum zinc levels in lung cancer patients. (Wang Y et al., *World J Surg. Oncol.*, 2019). Similar trends in low zinc levels have been reported in many other cancers, including head and neck, cervical, thyroid, prostate, and others. Selenium nutrition and cancer risk: Low levels of selenium in the body are associated with increased risk of death and poor immunity. Many studies have shown the effect of high levels of the mineral selenium on prostate, lung, colorectal and bladder cancer. (Rayman MP, *Lancet*, 2012) Selenium supplementation of 200mcg per day reduced the incidence of prostate cancer by 50%, lung cancer by 30%, and colorectal cancer by 54%. (Reid ME et al., *Nutr & Cancer*, 2008) For healthy people without cancer, including dietary selenium has been reported to boost immunity by increasing the activity of natural killer cells. (Büntzel J et al, *Anticancer Res.*, 2010). In addition, a selenium-rich diet can help cancer patients by reducing the toxic effects associated with chemotherapy. These supplements have been shown to significantly reduce infection rates for non-Hodgkin's lymphoma. (Asfour IA et al., *Biol. Trace Elem. Res.*, 2006) Selenium supplementation has also been shown to reduce renal toxicity and bone marrow suppression with some chemical agents (Xu YJ et al., *Biol. Trace Elem. Res.*, 1997), and reduces radiation toxicity due to

difficulty in swallowing. (Büntzel J et al, Anticancer Res., 2010) For bone and muscle health, we need to consume adequate amounts of calcium, but it is beneficial to consume more calcium than the recommended amount of 1000-1200 mg per day. may not and may be negatively associated with increased cancer-related mortality. As part of a balanced healthy diet, high-dose calcium supplements with calcium from natural food sources are recommended.

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