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VITAMINS AND MINERALS : CLASSIFICATION AND FUNCTIONS (ВІТАМІНИ ТА МІНЕРАЛИ: КЛАСИФІКАЦІЯ ТА ФУНКЦІЇ)

Святелик К.Ю. – здобувач вищої освіти групи ХТ2/1

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В статті розкриваються типи та функції вітамінів та мінералів, їх вплив на здоров'я людини та продукти в яких вони містяться.

***Ключові слова:** вітаміни, мінерали, функції вітамінів та мінералів, вплив на здоров'я вітамінів та мінералів, продукти в яких містяться вітаміни та мінерали.*

The article reveals the types and functions of vitamins and minerals, their impact on human health and products in which they are contained.

***Keywords:** vitamins, minerals, functions of vitamins and minerals, health effects of vitamins and minerals.*

Vitamins and minerals are two of the main types of nutrients that your body needs to survive and stay healthy. Vitamins help your body to grow and work the way it should. There are 13 essential vitamins — vitamins A, C, D, E, K, and the B vitamins (thiamine, riboflavin, niacin, pantothenic acid, biotin, B6, B12, and folate). Vitamins have different jobs to help keep the body working properly. Some vitamins help you to resist infections and keep your nerves healthy, while others may help your body to get energy from food or help your blood to clot properly. Like

vitamins, minerals also help your body to function. Minerals are elements that our bodies need to function that can be found on the earth and in foods. Some minerals, like iodine and fluoride, are only needed in very small quantities. Others, such as calcium, magnesium, and potassium, are needed in larger amounts. As with vitamins, if you eat a varied diet, you will probably get enough of most minerals [2].

Vitamins are organic substances present in minimum amounts in natural foodstuffs. Having too little of any particular vitamin may increase the risk of developing certain health issues. A vitamin is an organic compound, which means that it contains carbon. It is also an essential nutrient that the body may need to get from food.

- **Vitamin A**

Chemical names: retinol, retinal, and “the four carotenoids,” including beta carotene. It is fat-soluble. Function: It is essential for eye health. Deficiency: This may cause night blindness and keratomalacia, which causes the clear front layer of the eye to grow dry and cloudy. Good sources: These include liver, cod liver oil, carrots, broccoli, sweet potatoes, butter, kale, spinach, pumpkins, collard greens, some cheeses, eggs, apricots, cantaloupe melon, and milk.

- **Vitamin B1**

Chemical name: thiamine. It is water-soluble. Function: It is essential for producing various enzymes that help break down blood sugar. Deficiency: This may cause beriberi and Wernicke-Korsakoff syndrome. Good sources: These include yeast, pork, cereal grains, sunflower seeds, brown rice, whole grain rye, asparagus, kale, cauliflower, potatoes, oranges, liver, and eggs.

- **Vitamin B2**

Chemical name: riboflavin. It is water-soluble. Function: It is essential for the growth and development of body cells and helps metabolize food. Deficiency: Symptoms include inflammation of the lips and fissures in the mouth. Good sources: These include asparagus, bananas, persimmons, okra, chard, cottage cheese, milk, yogurt, meat, eggs, fish, and green beans.

- **Vitamin B3**

Chemical names: niacin, niacinamide. It is water-soluble. Function: The body needs niacin for the cells to grow and work correctly. Deficiency: Low levels result in a health issue called pellagra, which causes diarrhea, skin changes, and intestinal upset.

Good sources: Examples include chicken, beef, tuna, salmon, milk, eggs, tomatoes, leafy vegetables, broccoli, carrots, nuts and seeds, tofu, and lentils.

- **Vitamin B5**

Chemical name: pantothenic acid. It is water-soluble. Function: It is necessary for producing energy and hormones. Deficiency: Symptoms include paresthesia, or “pins and needles.” Good sources: These include meats, whole grains, broccoli, avocados, and yogurt.

- **Vitamin B6**

Chemical names: pyridoxine, pyridoxamine, pyridoxal. It is water-soluble. Function: It is vital for the formation of red blood cells. Deficiency: Low levels may lead to anemia and peripheral neuropathy. Good sources: These include chickpeas, beef liver, bananas, squash, and nuts.

- **Vitamin B7**

Chemical name: biotin. It is water-soluble. Function: It enables the body to metabolize proteins, fats, and carbohydrates. It also contributes to keratin, a structural protein in the skin, hair, and nails. Deficiency: Low levels may cause dermatitis or inflammation of the intestines. Good sources: These include egg yolk, liver, broccoli, spinach, and cheese.

- **Vitamin B9**

Chemical names: folic acid, folinic acid. It is water-soluble. Functions: It is essential for making DNA and RNA. Deficiency: During pregnancy, this can affect the fetus's nervous system. Doctors recommend folic acid supplements before and during pregnancy. Good sources: These include leafy vegetables, peas, legumes, liver, some fortified grain products, and sunflower seeds. Also, several fruits have moderate amounts.

- **Vitamin B12**

Chemical names: cyanocobalamin, hydroxocobalamin, methylcobalamin. It is water-soluble. Function: It is essential for a healthy nervous system. Deficiency: Low levels may lead to neurological problems and some types of anemia. Good sources: Examples include fish, shellfish, meat, poultry, eggs, milk and other dairy products, fortified cereals, fortified soy products, and fortified nutritional yeast. Doctors may recommend that people with vegan diets take B12 supplements.

- **Vitamin C**

Chemical name: ascorbic acid. It is water-soluble. Function: It contributes to collagen production, wound healing, and bone formation. It also strengthens blood vessels, supports the immune system, helps the body absorb iron, and acts as an antioxidant. Deficiency: This may result in scurvy, which causes bleeding gums, a loss of teeth, and poor tissue growth and wound healing. Good sources: These include fruit and vegetables, but cooking destroys vitamin C.

- **Vitamin D**

Chemical names: ergocalciferol, cholecalciferol. It is fat-soluble. Function: It is necessary for the healthy mineralization of bone. Deficiency: This may cause rickets and osteomalacia, or softening of the bones. Good sources: Exposure to UVB rays from the sun or other sources causes the body to produce vitamin D. Fatty fish, eggs, beef liver, and mushrooms also contain the vitamin.

- **Vitamin E**

Chemical names: tocopherol, tocotrienol. It is fat-soluble. Function: Its antioxidant activity helps prevent oxidative stress, an issue that increases the risk of widespread inflammation and various diseases. Deficiency: This is rare, but it may cause hemolytic anemia in newborns. This condition destroys blood cells. Good sources: These include wheat germ, kiwis, almonds, eggs, nuts, leafy greens, and vegetable oils.

- **Vitamin K**

Chemical names: phyloquinone, menaquinone. It is fat-soluble. Function: It is necessary for blood clotting. Deficiency: Low levels may cause an unusual susceptibility to bleeding, or bleeding diathesis. Good sources: These include natto, leafy greens, pumpkins, figs, and parsley.

MINERALS

- **Calcium**

Benefits: Builds and protects bones and teeth. Helps with muscle contractions and relaxation, blood clotting, and nerve impulse transmission. Plays a role in hormone secretion and enzyme activation. Helps maintain healthy blood pressure. Good food sources: Yogurt, cheese, milk, tofu, sardines, salmon, fortified juices, leafy green vegetables, such as broccoli and kale (but not spinach or Swiss chard, which have binders that lessen absorption). Some facts: Adults absorb roughly 30% of calcium ingested, but this can vary depending on the source. Diets very high in calcium may increase the risk of prostate cancer.

- **Chloride**

Benefits: Balances fluids in the body. A component of stomach acid, essential to digestion. Good food sources: Salt (sodium chloride), soy sauce, processed foods. Some facts: New recommendations (DRIs) for chloride are under development by the Institute of Medicine.

- **Chromium**

Benefits: Enhances the activity of insulin, helps maintain normal blood glucose levels, and is needed to free energy from glucose. Good food sources: Meat, poultry, fish, eggs, potatoes, some cereals, nuts, cheese. Some facts: Unrefined foods such as brewer's yeast, nuts, and cheeses are the best sources of chromium, but brewer's yeast can sometimes cause bloating and nausea, so you may choose to get chromium from other food sources.

- **Copper**

Benefits: Plays an important role in iron metabolism and immune system. Helps make red blood cells. Good food sources: Liver, shellfish, nuts, seeds, whole-grain products, beans, prunes, cocoa, black pepper. Some facts: More than half of the copper in foods is absorbed.

- **Fluoride**

Benefits: Encourages strong bone formation. Keeps dental cavities from starting or worsening. Good food sources: Water that is fluoridated, toothpaste with fluoride, marine fish, teas. Some facts: Harmful to children in excessive amounts.

- **Iodine**

Benefits: Part of thyroid hormone, which helps set body temperature and influences nerve and muscle function, reproduction, and growth. Prevents goiter and a congenital thyroid disorder. Good food sources: Iodized salt, processed foods, seafood. Some facts: To prevent iodine deficiencies, some countries add iodine to salt, bread, or drinking water.

- **Iron**

Benefits: Helps hemoglobin in red blood cells and myoglobin in muscle cells ferry oxygen throughout the body. Needed for chemical reactions in the body and for making amino acids, collagen, neurotransmitters, and hormones. Good food sources: Red meat, poultry, eggs, fruits, green vegetables, fortified bread and grain products. Some facts: Many women of childbearing age don't get enough iron. Women who do not menstruate probably need the same amount of iron as men. Because iron is harder to absorb from plants, experts suggest vegetarians get twice the recommended amount (assuming the source is food).

- **Magnesium**

Benefits: Needed for many chemical reactions in the body Works with calcium in muscle contraction, blood clotting, and regulation of blood pressure. Helps build bones and teeth. Good food sources: Green vegetables such as spinach and broccoli, legumes, cashews, sunflower seeds and other seeds, halibut, whole-wheat bread, milk.

Some facts: The majority of magnesium in the body is found in bones. If your blood levels are low, your body may tap into these reserves to correct the problem.

- **Manganese**

Benefits: Helps form bones. Helps metabolize amino acids, cholesterol, and carbohydrates. Good food sources: Fish, nuts, legumes, whole grains, tea. Some facts: If you take supplements or have manganese in your drinking water, be careful not to exceed the upper limit. Those with liver damage or whose diets supply abundant manganese should be especially vigilant.

- **Molybdenum**

Benefits: Part of several enzymes, one of which helps ward off a form of severe neurological damage in infants that can lead to early death. Good food sources: Legumes, nuts, grain products, milk. Some facts: Molybdenum deficiencies are rare.

- **Phosphorus**

Benefits: Helps build and protect bones and teeth. Part of DNA and RNA. Helps convert food into energy. Part of phospholipids, which carry lipids in blood and help shuttle nutrients into

and out of cells. Good food sources: Wide variety of foods, including milk and dairy products, meat, fish, poultry, eggs, liver, green peas, broccoli, potatoes, almonds. Some facts: Certain drugs bind with phosphorus, making it unavailable and causing bone loss, weakness, and pain.

- **Selenium**

Benefits: Acts as an antioxidant, neutralizing unstable molecules that can damage cells. Helps regulate thyroid hormone activity. Good food sources: Organ meats, seafood, walnuts, sometimes plants (depends on soil content), grain products. Some facts: Researchers are investigating whether selenium may help reduce the risk of developing cancer, but with mixed results.

- **Sulfur**

Benefits: Helps form bridges that shape and stabilize some protein structures. Needed for healthy hair, skin, and nails. Good food sources: Protein-rich foods, such as meats, fish, poultry, nuts, legumes. Some facts: Sulfur is a component of thiamin and certain amino acids. There is no recommended amount for sulfur. Deficiencies occur only with a severe lack of protein.

- **Zinc**

Benefits: Helps form many enzymes and proteins and create new cells. Frees vitamin A from storage in the liver. Needed for immune system, taste, smell, and wound healing. When taken with certain antioxidants, zinc may delay the progression of age-related macular degeneration. Good food sources: Red meat, poultry, oysters and some other seafood, fortified cereals, beans, nuts. Some facts: Because vegetarians absorb less zinc, experts suggest that they get twice the recommended requirement of zinc from plant foods.

Література:

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