



## **THE ROLE OF ZINC IN PROVIDING A HEALTHY NUTRITION**

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**ABSTRACT:** The article analyzes the importance of zinc in human health, its biological functions in the body and its role in a healthy diet. The impact of zinc deficiency on health, its main sources and daily requirements are discussed. The article also provides practical recommendations for preventing zinc deficiency and ensuring a healthy diet. According to the results of the study, zinc participates in the activity of many enzymes in the human body, strengthens immunity and stabilizes metabolism.

**KEYWORDS:** Zinc, microelement, healthy nutrition, enzymes, immune system, minerals, energy metabolism, prevention, biologically active substance.

### **INTRODUCTION**

Healthy nutrition is one of the main conditions for human life. In addition to macronutrients (proteins, fats, carbohydrates), micronutrients are also important in maintaining human health. One of these is zinc (Zn), which is involved in hundreds of biochemical processes in the body. Zinc strengthens the immune system, participates in cell division, growth and renewal, and stabilizes metabolism. It also ensures the health of the skin, hair and nails.

Today, zinc deficiency is a serious health problem worldwide, especially observed in children, adolescents, pregnant women and the elderly. Adequate intake of zinc is of great importance in strengthening immunity, increasing resistance to diseases and ensuring an overall healthy lifestyle.

**OBJECTIVE:** The purpose of the study is to study the biological functions of zinc in the human body, determine its importance in a healthy diet, and develop practical recommendations for preventing zinc deficiency.

**BIOLOGICAL SIGNIFICANCE OF ZINC:** Zinc is one of the most important trace elements in the human body, the total amount of which is approximately 2–3 grams. Most of it is located in the bones (up to 60%), muscles (about 30%), liver, kidneys, and skin. Zinc is an integral part of a number of enzymes and metabolic systems inside the cell. Without its participation, many biological processes cannot be fully realized.

Zinc is a part of more than 300 enzymes and plays an important role in various physiological processes, including:

Participates in cell division and growth;

Stimulates the immune system, strengthens the activity of lymphocytes and phagocytes;



Participates in the synthesis of the hormone insulin and sugar metabolism, thereby stabilizing blood sugar levels;

Strengthens the nervous system and brain function, participates in the conduction of nerve impulses;

Ensures collagen synthesis and skin, hair, and nail health.

Zinc has antioxidant properties, protects cells from the effects of free radicals and slows down the aging process. It maintains the balance of oxidation-reduction reactions in the body, therefore it is important for tissue renewal and wound healing.

Another important function of zinc is its participation in the synthesis of DNA and RNA. It ensures the stability of nucleic acids and accelerates cell renewal processes. At the same time, it participates in the functioning of the reproductive system, especially in the synthesis of testosterone in men. Zinc deficiency can lead to impaired spermatogenesis and a decrease in male fertility.

Zinc is essential for pregnancy and childbirth in women - it helps ensure healthy fetal development and helps the nervous system develop. Therefore, zinc deficiency increases the risk of pregnancy complications, premature birth, or low birth weight in women. Zinc also plays an important role in metabolism. It activates the metabolism of proteins, fats and carbohydrates, enhances the activity of enzymes and strengthens the processes of energy production. It also provides the ability to taste and smell, therefore, with zinc deficiency, the sense of taste may deteriorate or disappear altogether.

Zinc also has antibacterial and anti-inflammatory effects. It reduces inflammatory processes, limits the activity of inflammatory mediators, which is especially effective in skin diseases (acne, dermatitis, etc.). Therefore, zinc is widely used in medicine and cosmetology.

Therefore, zinc is not only a key factor in healthy eating, but also in maintaining overall health. Its sufficient intake maintains the human immune system in a stable state, improves nervous function and makes the body more resistant to external influences.

### **ZINC DEFICIENCY AND ITS CONSEQUENCES**

Zinc deficiency is widespread throughout the world, and its consequences are very diverse. Its main symptoms are as follows:

Slow growth and decreased immunity in children;

Dry skin, slow healing of wounds;

Hair loss, brittle nails;

Loss of appetite, slow recovery after illness;

Risk of fetal development defects in women.



If zinc deficiency persists for a long time, disorders in the endocrine system, metabolism and reproductive functions may also occur. Therefore, it is necessary to ensure that zinc is present in sufficient quantities in the diet.

## SOURCES OF ZINC AND ITS ABSORPTION

Zinc is often found in protein foods. The best sources are as follows:

Food type	Zinc content (mg/100g)	Note
Red meat (lamb, beef)	5-9	High bioavailability
Liver	6-12	A rich source of minerals
Chicken egg	1-2	Additional resource
Fish, sardines, tuna	1-3	Omega-3 and zinc at the same time
Nuts, almonds	2-4	An important resource for vegetarians
Cereal products	1-3	Phytic acid reduces the absorption of zinc
Beans, peas	2-3	Plant source
Dark chocolate	2-3	A natural antioxidant

The absorption of zinc from animal products is up to 60-70%, while this indicator is lower in plant products - around 20-30%. Therefore, it is advisable for individuals on a vegetarian diet to take zinc-preserving biological supplements.

## DAILY REQUIREMENTS OF ZINC

According to the World Health Organization, the daily limit of zinc is as follows:

Category	Daily norm (mg)
Children (1-9 years)	3-5
Adolescents	8-11
Adult men	11-14
Adult women	8-10
Pregnant women	11-13
Breastfeeding women	12-14

Zinc is not stored in the body, so it must be consumed regularly through daily food.

## RESULTS AND DISCUSSION

The results of the study show that zinc is a necessary substance for many vital processes in the human body. It activates the immune system, participates in metabolism, ensures cell



renewal, and stabilizes the nervous system. Zinc deficiency causes many diseases and impaired physiological processes.

Sufficient supply of zinc in a healthy diet increases a person's working capacity, reduces fatigue, and increases resistance to diseases. Regular consumption of zinc-containing products is an important aspect of maintaining human health.

**CONCLUSION:** Zinc is one of the main trace elements necessary for human health, and its role in a healthy diet is invaluable. It strengthens the immune system, stabilizes cell function, and ensures healthy skin and hair. Zinc deficiency can lead to the development of various diseases. Therefore, it is very important to maintain its level by regularly including zinc-rich foods in the diet and properly processing them.

Adequate zinc intake in a healthy diet improves a person's overall quality of life, reduces the risk of diseases, and allows for a longer life.

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