



Enzymes And Their Role In Our Life

Akhmadalieva Nargiza Jabbarovna ,

Teacher of the department

General Medicine, Angren University

ahmadalievanargiza34@gmail.com

Abstract: Enzymes are vital catalysts that deserve our attention no less than knowledge about vitamins and microelements. They play a key role in many of our body's biochemical processes, from digestion to cellular respiration. In this article we will look at why our body needs enzymes, how they work, where they can be obtained from, and how to maintain an optimal level of enzyme activity.

Key words: Enzyme, enzymology, vitamin, microelement, proteins, DNA, metabolite, hydrolase, oxidoreductase, amylase, lipase, protease.

Why does your body need enzymes and where to get them?

Enzymes are vital catalysts that deserve our attention no less than knowledge about vitamins and microelements. They play a key role in many of our body's biochemical processes, from digestion to cellular respiration. In this article we will look at why our body needs enzymes, how they work, where they can be obtained from, and how to maintain an optimal level of enzyme activity.

The role of enzymes in the human body

What are enzymes and their biochemical function

Enzymes are proteins that speed up chemical reactions in our body without acting as a reactant. These biological catalysts can be compared to keys that initiate and regulate vital processes such as food digestion, tissue repair, and even DNA copying.

How enzymes affect the speed of metabolic processes

Without enzymes, many of the metabolic reactions necessary to maintain life are simply impossible or would proceed too slowly. Enzymes significantly increase the speed of these reactions, ensuring the efficient functioning of the body as a whole.

Review of the main groups of enzymes and their importance for health

The main groups of enzymes include hydrolases, oxidoreductases, transferases and many others. Each group performs a specific role, for example, hydrolases help break down complex molecules into simpler ones during digestion.



Importance of Enzymes for Digestion

Nutrient breakdown and food absorption

Digestive enzymes such as amylase, lipase and protease are essential for the breakdown of carbohydrates, fats and proteins respectively. Without enzymatic support, the absorption of nutrients from food would be extremely inefficient.

Enzymes in the processes of digestion of proteins, fats and carbohydrates

A complex system of enzymes is required for proteins to become amino acids and carbohydrates to be converted into glucose and other sugars. A similar system exists for fats, which are converted into fatty acids and glycerol.

Symptoms and consequences of enzyme deficiency for the body

Enzyme deficiency can cause a number of problems, including digestive disorders, nutritional deficiencies and even chronic diseases. Symptoms of deficiency may include bloating, gas, diarrhea, or constipation.

External and internal sources of enzymes

Enzymes produced by the body

Our body produces enzymes in sufficient quantities, provided that we live a healthy lifestyle and have a balanced diet. They are synthesized in various organs and tissues, including the pancreas and small intestine.

Food sources of enzymes: which foods are rich in enzymes

Enzyme-rich foods include unprocessed fruits and vegetables, dairy products, and fermented foods like sauerkraut. They help supplement internal enzyme reserves and support digestion.

Enzymes in the form of dietary supplements: when to take them

Sometimes the body needs external help, in such cases you can buy digestive enzymes. For example, iTAB provides a wide selection of enzyme supplements. Incoda Digestive Enzymes may also be a useful addition to the diet for certain conditions such as chronic pancreatitis.

How to increase enzyme levels in the body

Proper nutrition to maintain enzyme activity

Including foods rich in natural enzymes and micronutrients in your diet will help maintain enzyme activity. It is also worth noting the importance of



moderation in food and avoiding overeating, which reduces the burden on the digestive system.

Life Habits that Promote Enzyme Production

Regular exercise, adequate sleep and stress management all have beneficial effects on enzyme production. The opposite lifestyle can disrupt the enzyme balance, leading to various health problems.

Combination of products to optimize enzymatic reactions

Including foods that naturally combine, such as fruits high in vitamin C combined with plant sources of iron, can promote better nutrient absorption and assimilation. A balanced combination of fiber, protein and fat will also help optimize the functioning of digestive enzymes.

Enzymes (from the Latin fermentum “leaven”), or enzymes (from the Greek ζύμη, ἔνζυμον “leaven”), are usually complex protein compounds, RNA (ribozymes) or their complexes that accelerate chemical reactions in living systems. Each enzyme, folded into a specific structure, accelerates the corresponding chemical reaction: the reactants in such a reaction are called substrates, and the resulting substances are called products. Enzymes are substrate specific: ATPase catalyzes the breakdown of only ATP, and phosphorylase kinase phosphorylates only phosphorylase. Enzyme activity can be regulated by activators (increased) and inhibitors (decreased).

Protein enzymes are synthesized on ribosomes, and RNA is synthesized in the nucleus.

The terms enzyme and enzyme have long been used as synonyms: the first mainly in Russian and German scientific literature, the second in English and French.

The science of enzymes is called enzymology, not fermentology (so as not to confuse the roots of the Latin and Greek words).

Enzymes are biocatalysts, i.e. substances of biological origin that accelerate chemical reactions. An organized sequence of metabolic processes is possible provided that each cell is provided with its own genetically specified set of enzymes. Only under this condition is a coordinated reaction sequence achieved. Enzymes also take part in the regulation of many metabolic processes, thereby ensuring that metabolism corresponds to changed conditions. Almost all enzymes are proteins. Catalytically active nucleic acids, “ribozymes,” are also known.

Enzyme activity



The catalytic effect of an enzyme, i.e. its activity, is determined under standard conditions by the increase in the rate (purple color in the diagram) of the catalytic reaction (orange color) compared to the non-catalytic reaction (yellow color). Typically, the reaction rate is indicated as the change in the concentration of the substrate or product per unit time (mol/(l s)). Since catalytic activity does not depend on the volume of solution in which the reaction takes place, enzyme activity is expressed in catalytes; 1 cat is the amount of enzyme that converts 1 mole of substrate in 1 s. Another unit of activity is the international unit (E) - the amount of enzyme converting 1 μmol of substrate in 1 min (1 E = 16.7 ncat).

Reaction and substrate specificity

The action of most enzymes is highly specific. The concept of specificity refers not only to the types of catalytic reactions (reaction specificity), but also to the nature of the substrate compounds (substrate specificity). As an example, the diagram shows enzymes that break down a chemical bond. Highly specific enzymes (type A - top line of the table) catalyze the cleavage of only one type of bond in substrates of a certain structure. Type B enzymes (middle row) have limited reaction specificity but broad substrate specificity. Type B enzymes (low reaction and low substrate specificity; bottom line) are rare.

Conclusion

Enzymes are essential participants in many processes in our body. The health of our digestion, as well as overall well-being, depends on the stable operation of enzyme systems. Thanks to modern advances in nutrition, we are able to maintain enzyme balance both through proper nutrition and a healthy lifestyle, and through high-quality dietary supplements.

Bibliography:

1. ru.wikipedia.org/wiki/ферменты
2. <https://www.chem.msu.ru/rus/teaching/kolman/94.htm>
3. <https://itab.pro/articles/zachem-vashemu-telu-nuzhny-fermenty-i-otkuda-ih-vzyat-258/>