

Amino acids - description, benefits, effects on the body and the best sources

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Abstract. There are about 200 amino acids in nature. 20 of them are found in our food, 10 of them have been recognized as essential. Amino acids are necessary for the full functioning of our body. They are included in many protein products, are used as dietary supplements for sports nutrition, medicines are made from them, and they are added to animal feed.

Key words: amino acids, general characteristics, daily requirement, digestibility, beneficial properties, signs of deficiency, signs of excess

Foods rich in amino acids:

- Eggs [1],
- cow's milk,
- Goat's milk
- Beef
- Mutton
- Pork
- Amateur sausage
- Chicken
- Cod
- Zander
- Cheese
- Low-fat cottage cheese [2]
- Soybeans
- Wheat flour
- Potatoes [3]

General characteristics of amino acids

Amino acids belong to the class of organic compounds, used by the body in the synthesis of hormones, vitamins, pigments and purine bases. Proteins are made up of amino acids [4]. Plants and most microorganisms are able to synthesize all the amino acids they need for life on their own, unlike animals and humans. Our body can obtain a number of amino acids only from food.

Essential amino acids include: valine, leucine, isoleucine, threonine, lysine, methionine, phenylalanine, arginine, histidine, tryptophan.

Essential amino acids produced by our body are glycine, proline, alanine, cysteine, serine, asparagine, aspartate, glutamine, glutamate, tyrosine.

Although this classification of amino acids is very arbitrary. After all, histidine and arginine, for example, are synthesized in the human body, but not always in sufficient quantities. The nonessential amino acid tyrosine can become essential if there is a lack of phenylalanine in the body.

Daily requirement for amino acids

Depending on the type of amino acid, its daily requirement for the body is determined. The body's total need for amino acids, recorded in dietary tables, is from 0.5 to 2 grams per day.

The need for amino acids increases:

- during the period of active growth of the body;
- during active professional sports;
- during periods of intense physical and mental stress;
- during illness and during recovery.

The need for amino acids decreases:

For congenital disorders associated with the absorption of amino acids. In this case, some protein substances can cause allergic reactions in the body, including problems in the gastrointestinal tract, itching and nausea.

Amino Acid Digestibility

The speed and completeness of absorption of amino acids depends on the type of products containing them. The amino acids contained in egg whites, low-fat cottage cheese, lean meat and fish are well absorbed by the body.

Amino acids are also quickly absorbed with the right combination of foods: milk is combined with buckwheat porridge [5] and white bread, all kinds of flour products with meat and cottage cheese.

Beneficial properties of amino acids, their effect on the body

Each amino acid has its own effect on the body. So methionine is especially important for improving fat metabolism in the body; it is used as a prevention of atherosclerosis, cirrhosis and fatty liver degeneration.

For certain neuropsychiatric diseases, glutamine and aminobutyric acids are used. Glutamic acid is also used in cooking as a flavoring additive. Cysteine is indicated for eye diseases.

The three main amino acids - tryptophan, lysine and methionine, are especially necessary for our body. Tryptophan is used to accelerate growth [6] and development of the body, and it also maintains nitrogen balance in the body.

Lysine ensures normal growth of the body and participates in the processes of blood formation.

The main sources of lysine and methionine are cottage cheese, beef, and some types of fish (cod, pike perch, herring). Tryptophan is found in optimal quantities in offal, veal and game.

Interaction with Essential Elements

All amino acids are soluble in water. Interact with vitamins B, A, E, C [7-10] and some microelements; participate in the formation of serotonin, melanin, adrenaline, norepinephrine and some other hormones.

Signs of deficiency and excess of amino acids

Signs of a lack of amino acids in the body:

- loss of appetite or decreased appetite;
- weakness, drowsiness;
- delayed growth and development;
- hair loss [11];
- deterioration of skin condition;
- anemia;
- weak resistance to infections.

Signs of excess of certain amino acids in the body:

- disorders of the thyroid gland, hypertension - occur with an excess of tyrosine;
- early gray hair, joint diseases, aortic aneurysm can be caused by an excess of the amino acid histidine in the body;
- methionine increases the risk of stroke and heart attack.

Such problems can arise only if there is a lack of vitamins B, A, E, C and selenium in the body [12]. If these beneficial substances are contained in the right amount, excess amino acids are quickly neutralized, due to the conversion of excess into substances beneficial to the body.

Factors influencing the content of amino acids in the body

Nutrition, as well as human health, are the determining factors in the content of amino acids in the optimal ratio. Lack of certain enzymes, diabetes mellitus, and liver damage lead to uncontrolled levels of amino acids in the body.

Amino acids for health, energy and beauty

- To successfully build muscle mass in bodybuilding, amino acid complexes consisting of leucine, isoleucine and valine are often used.
- To maintain energy during training, athletes use methionine, glycine and arginine, or products containing them, as dietary supplements.
- For any person leading an active healthy lifestyle, special foods are needed that contain a number of essential amino acids to maintain excellent physical shape, quickly restore strength, burn excess fat or build muscle mass.

Literature

1. Tarantul, A., & Eliseeva, T. (2020). Chicken egg. *Journal of Healthy Eating and Dietetics*, (11), 51-66. DOI: 10.59316/.vi11.65
2. Yampolsky, A., & Eliseeva, T. (2020). Cottage cheese. *Journal of Healthy Eating and Dietetics*, (11), 37-50. DOI: 10.59316/.vi11.64
3. Tarantula, A. (2018). Potatoes (Tuberous nightshade, Solánium tuberosum). *Journal of Healthy Eating and Dietetics*, (4), 22-32. DOI: 10.59316/.vi4.18
4. Eliseeva, T., & Shelestun, A. (2019). Protein - description, benefits, effect on the body and the best sources. *Journal of Healthy Eating and Dietetics*, 1(7), 54-78. DOI: 10.59316/j.edpl.2018.7.6
5. Eliseeva, T., & Tkacheva, N. (2019). Buckwheat (lat. Fagopyrum). *Journal of Healthy Eating and Dietetics*, 1 (7), 34-44. DOI: 10.59316/.vi7.37
6. Eliseeva, T., & Tkacheva, N. (2020). Food for growth. *Journal of Healthy Eating and Dietetics*, (11). DOI: 10.59316/j.edpl.2020.11.12
7. Eliseeva, T., & Mironenko, A. (2019). B vitamins – description, benefits, effects on the body and the best sources. *Journal of Healthy Eating and Dietetics*, 2 (8), 74-87. DOI: 10.59316/.vi8.45
8. Eliseeva, T., & Mironenko, A. (2018). Vitamin A (retinol) - description, benefits and where it is found. *Journal of Healthy Eating and Dietetics*, 3(9), 41-86. DOI: 10.59316/j.edpl.2018.3.5
9. Eliseeva, T., & Mironenko, A. (2018). Vitamin E – description, benefits, effect on the body and the best sources. *Journal of Healthy Eating and Dietetics*, 4 (6). DOI: 10.59316/.vi6.33
10. Eliseeva, T., & Mironenko, A. (2018). Vitamin C (ascorbic acid) description, benefits and where it is found. *Journal of Healthy Eating and Dietetics*, 2 (4), 33-44. DOI: 10.59316/.vi4.19
11. Tkacheva, N., & Eliseeva, T. (2020). Nutrition for healthy hair - healthy and dangerous foods, recommendations. *Journal of Healthy Eating and Dietetics*, (12). DOI: 10.59316/j.edpl.2020.12.12
12. Eliseeva, T. (2022). Selenium (Se) – value for the body and health + 30 best sources. *Journal of Healthy Eating and Dietetics*, 1 (19), 55-64. DOI: 10.59316/.vi19.160

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