

Serine - description, benefits, effect on the body and the best sources

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Abstract. Serine is one of the most important amino acids in the human body. It is involved in the production of cellular energy. The first mention of serine is associated with the name of E. Kramer, who in 1865 isolated this amino acid from silk threads produced by the silkworm.

Keywords: serine, general characteristics, daily requirement, digestibility, beneficial properties, signs of deficiency, signs of excess

Serine rich foods:

- Soya beans
- Pumpkin seeds
- Edible chestnuts
- Nuts
- Coconuts and their shavings
- Eggs [1]
- Milk
- Hard cheeses
- Cottage cheese [2]
- Kumis
- Beef and lamb
- Poultry meat
- Sea fish (herring, mackerel, sardine)
- Cauliflower and broccoli [3]
- Sweet and puffed corn

General characteristics of serine

Serine belongs to the group of non-essential amino acids and can be formed from 3-phosphoglycerate. Serine has the properties of amino acids and alcohols. It plays an important role in the catalytic activity of many protein-digesting enzymes.

In addition, this amino acid takes an active part in the synthesis of other amino acids: glycine, cysteine, methionine and tryptophan. Serine exists in the form of two optical isomers - L and D.6. During the process of biochemical transformation in the body, serine is converted into pyruvic acid.

Serine is found in proteins in the brain (including the nerve sheath). Used as a moisturizing component in the production of cosmetic creams. Participates in the construction of natural proteins, strengthens the immune system, providing it with antibodies. In addition, it is involved in the transmission of nerve impulses to the brain [4], in particular to the hypothalamus [5].

Daily requirement for serine

The daily requirement for serine for an adult is 3 grams. Serine should be taken between meals. This is due to the fact that it is able to increase blood glucose levels. It should be taken into account that serine is a replaceable amino acid, and it can be formed from other amino acids, as well as from sodium 3-phosphoglycerate.

The need for serine increases:

- for diseases associated with decreased immunity;
- when memory weakens [6]. With age, serine synthesis decreases, therefore, to improve mental performance, it must be obtained from foods rich in this amino acid;
- for diseases during which hemoglobin production decreases;
- for iron deficiency anemia [7].

The need for serine is reduced:

- for epileptic seizures [8];
- for organic diseases of the central nervous system;
- chronic heart failure;
- for mental disorders manifested by anxiety, depression [9], manic-depressive psychosis, etc.;
- in case of chronic renal failure;
- with alcoholism of the first and second degrees.

Serine absorption

Serine is well absorbed. At the same time, it actively interacts with taste buds, thanks to which our brain receives a more complete picture of what exactly we are eating.

Beneficial properties of serine and its effect on the body

Serine regulates cortisol levels in muscles. At the same time, the muscles retain their tone and structure and are not subject to destruction. Creates antibodies and immunoglobulins, thereby forming the body's immune system.

Participates in the synthesis of glycogen, accumulating it in the liver.

Normalizes thought processes, as well as brain functioning [10].

Phosphatidylserine (a special form of serine) has a therapeutic effect on metabolic disorders of sleep and mood.

Interaction with other elements:

In our body, serine can be converted from glycine and pyruvate. In addition, there is the possibility of a reverse reaction, as a result of which serine can again become pyruvate. At the same time, serine is also involved in the construction of almost all natural proteins. In addition, serine itself has the ability to interact with proteins, forming complex compounds.

Signs of serine deficiency in the body

- weakening of memory;
- Alzheimer's disease [11];
- depression;
- decreased performance.

Signs of excess serine in the body

- hyperactivity of the nervous system;
- high hemoglobin level;
- elevated blood glucose levels.

Serine for beauty and health

Serine plays an important role in the structuring of proteins [12] and has a beneficial effect on the nervous system, so it can be considered one of the amino acids that our body needs for beauty. After all, a healthy nervous system allows us to feel better and therefore look better; the presence of a sufficient amount of protein in the body gives the skin turgor and velvety [13].

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