

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

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Abstract. Hydroxyproline is a widely distributed proteinogenic amino acid. It is the main component of a protein called collagen. In addition, hydroxyproline is also found in elastin, which is responsible for normal skin turgor. Thanks to the presence of this amino acid in our body, collagen is able to maintain stability and can successfully perform its functions.

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

Foods rich in hydroxyproline:

- Beef
- Mutton
- Millet
- Wheat
- Cereals
- Wild rice [1]
- Flax-seed
- Sea fish (Herring, Tuna, Pelengas)
- Hard cheeses
- Gelatin
- Squid, octopus and cuttlefish
- Oyster
- Crustaceans
- Snail
- Jellyed pork feet

General characteristics of hydroxyproline

Despite the fact that hydroxyproline is a non-essential amino acid, its presence in our body is closely related to the presence of two substances essential for the formation of this compound. The necessary substances are the amino acid proline and ascorbic acid. Only in their presence can generation of hydroxyproline occur.

Daily requirement for hydroxyproline

The daily requirement of hydroxyproline, according to research by Danish scientists, cannot be lower than 5 grams. It should be emphasized that this amino acid is successfully absorbed by the body only in the presence of ascorbic acid.

Based on this, we can say that when consuming foods rich in the proteinogenic amino acid hydroxyproline, one should also consume vitamin C [2]. And since vitamin C is grown in berries and trees

branches is most beneficial for our body, it is advisable to consume it together with vegetables, fruits, and herbs.

The need for hydroxyproline increases with:

- toxicosis of pregnant women;
- reduced immunity;
- depression [3] and similar conditions;
- general intoxication of the body;
- increased brain load;
- stressful situations;
- increased physical fatigue;
- muscular dystrophy;
- heavy blood loss (including during menstruation);
- wounds, injuries and other conditions in which the integrity of ligaments and skin is compromised.

The need for hydroxyproline decreases with:

- hydroxyproline intolerance;
- diseases associated with impaired absorption;
- Paget's disease.

Hydroxyproline absorption

Due to the fact that hydroxyproline is formed from the amino acid proline only in the presence of ascorbic acid, its absorption is also associated with vitamin C. Thanks to vitamin C, this amino acid is best absorbed not only in the gastrointestinal tract, but also at the level of cell membranes.

Beneficial properties of hydroxyproline and its effect on the body:

Hydroxyproline is responsible for providing the following needs of our body:

- improves skin condition [4];
- ensures the synthesis and preservation of glycogen in muscles and liver;
- participates in eliminating the consequences of poisoning in our body;
- accelerates and optimizes metabolism;
- activates the activity of the pituitary gland [5];
- stimulates the synthesis of hormones of the adrenal glands [6] and the thyroid gland [7];
- participates in the formation of protein compounds such as elastin and collagen [8];
- accelerates bone tissue regeneration;
- accelerates wound healing;
- takes an active part in the process of hematopoiesis;
- normalizes arterial and venous pressure;
- improves the body's immunity [9];
- has an analgesic effect;
- improves the activity of the gastrointestinal tract;
- relieves premenstrual tension syndrome;

- reduces headaches, as well as pain associated with diseases of the joints and spine.

Interaction with other elements:

As for the essential elements, the main elements with which hydroxyproline interacts are the proteinogenic amino acid proline and vitamin C. It is thanks to them that hydroxyproline is able to have such an effect on the basic functions of our body.

Signs of a lack of hydroxyproline in the body:

- muscle weakness and dystrophy;
- anemia (low level of hemoglobin in the blood) [10];
- weak brain activity, often turning into stupor;
- skin problems;
- frequent headaches [11] and menstrual pain;
- metabolic disorder;
- problems with excretory function (evacuation of harmful compounds is impaired).

Signs of excess hydroxyproline in the body:

There are practically no signs of an excess of hydroxyproline in medical studies. Theoretically, it is believed that we can talk about an excess of hydroxyproline only when the body has an excess of vitamin C in combination with an excess of proline. In very rare cases, individual intolerance to this substance may occur, manifested in allergic reactions.

Factors influencing the content of hydroxyproline in the body:

The main criteria responsible for the presence of hydroxyproline in the body are:

- the presence of primary components of hydroxyproline synthesis (proline and vitamin C);
- complete synthesis of this amino acid by our body;
- absence of diseases in which hydroxyproline ceases to be absorbed.

Hydroxyproline for beauty and health

In an article devoted to the amino acid proline, we have already talked about the effects this acid has on the skin and connective tissue. As for hydroxyproline, since this substance is a derivative of proline and vitamin C, its effects are also closely related to beauty. Thanks to hydroxyproline, the skin not only improves its turgor, but is also saturated with moisture, and also receives additional energy due to the presence of ascorbic acid.

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