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

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Abstract. Carnitine is an amino acid produced by the human body and other mammals from the essential amino acids lysine and methionine. Carnitine in its pure form is found in many meat and dairy products, and is also available in the form of medications and dietary supplements.

Carnitine is divided into 2 groups: L-carnitine (levocarnitine) and D-carnitine, which have completely different effects on the body. It is believed that as beneficial as L-carnitine is in the body, its antagonist, carnitine D, which is produced artificially, is equally harmful and toxic.

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

Foods rich in carnitine:

- Beef
- Beef steak
- Pork
- Bacon
- Duck
- Turkey
- Goose
- Fresh chicken
- Salmon
- Cod
- Fried chicken breast
- Ice cream
- Whole milk
- Mushrooms
- Cottage cheese [1]

General characteristics of carnitine

Carnitine is a vitamin-like substance with characteristics similar to B vitamins [2]. Carnitine was discovered in 1905, and scientists learned about its beneficial effects on the body only in 1962. It turns out that L-carnitine affects metabolic processes in the body, transporting fatty acids through membranes into the mitochondria of cells. Levocarnitine has been found in large quantities in the liver and muscles of mammals.

Daily requirement for carnitine

Accurate data on this matter is not yet available. Although the following figures appear more often in the medical literature: about 300 mg for adults, from 100 to 300 for children. When fighting excess weight and professional sports, these figures can be increased 10 times (up to 3000)! For diseases of

the cardiovascular system, infectious diseases of the liver and kidneys, the norm increases by 2–5 times.

The need for L-carnitine increases with:

- exhaustion, muscle weakness;
- brain lesions (cerebrovascular accident, stroke [3], encephalopathy);
- diseases of the heart and blood vessels;
- during active sports;
- during heavy physical and mental activity.

The need for carnitine decreases with:

- allergic reactions to the substance [4];
- cirrhosis [5];
- diabetes [6];
- hypertension [7].

Carnitine absorption:

Carnitine is easily and quickly absorbed by the body along with food. Or it is synthesized from other essential amino acids - methionine and lysine. In this case, all excess is quickly eliminated from the body.

Beneficial properties of L-carnitine and its effect on the body

Levocarnitine increases the body's endurance, reduces fatigue, supports the heart, and shortens the recovery period after training.

Helps dissolve excess fat, strengthens the muscle corset and builds muscles.

In addition, L-carnitine improves brain function, stimulating its cognitive activity, reduces fatigue during prolonged brain activity, and reduces the risk of developing Alzheimer's disease [8].

Accelerates the growth of children, activates fat metabolism, increases appetite, stimulates protein metabolism in the body.

Interaction with other elements:

Iron [9], ascorbic acid, B vitamins and essential amino acids: lysine and methionine take part in the synthesis of levocarnitine. Carnitine is highly soluble in water [10].

Signs of L-carnitine deficiency in the body:

- muscle weakness, muscle tremors;
- vegetative-vascular dystonia;
- growth retardation in children;
- hypotension;

- excess weight or, conversely, exhaustion.

Signs of excess carnitine in the body

Due to the fact that levocarnitine is not retained in the body, the excess is quickly eliminated from the body through the kidneys, and there are no problems with excess substance in the body.

Factors influencing the content of levocarnitine in the body

If there is a deficiency in the body of elements involved in the synthesis of levocarnitine, the presence of levocarnitine also decreases. In addition, vegetarianism reduces the amount of this substance in the body. But proper storage and preparation of food helps maintain the maximum concentration of levocarnitine in food.

Carnitine for health, slimness, energy

On average, we consume about 200 – 300 mg of carnitine in food. If a deficiency of the substance is detected in the body, the doctor may prescribe special medications containing L-carnitine.

People who are professionally involved in sports usually additionally consume carnitine as a dietary supplement, which helps build muscle mass and reduce fat tissue.

It has been noted that carnitine enhances the beneficial effects on the body of fat burners with caffeine [11], green tea, taurine and other natural substances that stimulate metabolic processes in the body.

L-carnitine, despite its promising properties in terms of weight loss, brings a noticeable effect from use only in the case of active physical activity. Therefore, it is included in the main composition of dietary supplements for athletes. Fans of “easy” weight loss usually do not feel the effect of using carnitine.

But, nevertheless, the substance is undoubtedly effective. It should be used in the form of special supplements by vegetarian families and elderly people, of course, if there are no contraindications from a doctor.

Conducted studies by foreign specialists indicate the positive effects of carnitine on the body of older people. At the same time, an improvement in the cognitive activity and energy of the experimental group was observed.

The results obtained in a group of adolescents suffering from vascular dystonia are encouraging. After using carnitine preparations together with coenzyme Q10, positive changes in the behavior of children were observed. Fatigue decreased and electrocardiogram readings improved.

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