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

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Abstract. Sterols are vital substances for our body. In the human body, they control the permeability of cell membranes and also influence metabolic processes. These substances are part of lipids and are essential for our health and attractiveness.

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

Sterol-rich foods:

- Nuts
- Soya beans
- Avocado [1]
- Oatmeal [2]
- Yeast [3]
- Rapeseed oil [4] and seeds
- Olive oil [5]
- Corn oil [6]
- Sunflower oil [7]
- Butter [8]
- Black chocolate
- Brain
- Meat and lard
- Seafood
- Sea fish (herring, mackerel, sardine)

General characteristics of sterols

Sterols are a component of plant and animal fats. They belong to the group of polycyclic alcohols and are found in the membranes of all living organisms.

Sterols occur in nature in two states: in the form of free alcohols and also in the form of esters of higher fatty acids. Externally, they are a crystalline substance, practically insoluble in water.

Sterols found in animals and humans are called zoosterols. The best known of these is cholesterol [9].

Scientists microbiologists have also identified another fairly common species - these are sterols of lower and higher plants, called phytosterols. These are B-sitosterol, campesterol, stigmasterol, brassicasterol. They are isolated from plant materials - soybean oil and rapeseed.

In addition, mycosterols (sterols from fungi, for example, ergosterol), as well as sterols from microorganisms, are also found in nature. Ergosterol is very beneficial for human health. When

exposed to ultraviolet light, it is converted into vitamin D [10]. Industrially produced sterols are used to produce hormones as well as vitamins D.

Daily requirement for sterols

Nutritionists say that the daily dosage of cholesterol should not exceed 300 mg. It is recommended to consume plant sterols in an amount of 2-3 grams per day.

For people with heart and vascular problems, the norm is calculated according to their physical condition and doctor's recommendations.

The need for sterols increases with:

- high blood cholesterol levels;
- weak immunity [11];
- pre-stroke and pre-infarction condition (phytosterols are used);
- insufficient amounts of vitamins A, E, K, D in the body [12-15];
- with a lack of energy;
- during pregnancy and breastfeeding [16,17];
- in case of decreased libido;
- if necessary, additional thermal energy;
- during heavy physical labor [18];
- under high mental stress;
- when signs of rickets appear [19] (ergosterol is used for treatment).

The need for sterols is reduced:

In the absence of all the above factors.

Sterol absorption

The process of assimilation of plant sterols occurs much more actively than that of animals. This discovery is associated with the fact that the chemical bond of phytosterols is less resistant to processing in gastric juice. In this regard, they are used for emergency energy generation.

Zoosterols, on the contrary, are able to resist splitting for a long time. And this, in turn, helps a person feel hungry less often. It is believed that men more often prefer products containing animal sterols, while women prefer plant sterols.

Beneficial properties of sterols and its effect on the body

According to studies conducted by Russian nutritionists, the positive effects of sterols on the human body have been identified and proven.

Phytosterols are used to reduce blood cholesterol levels [20], which is especially important in atherosclerosis [21]. They reduce the risk of stroke [22] and heart attack [23]. They have pronounced antioxidant activity [24]. Strengthen the immune system [25].

In addition, sterols are the basic substance for vitamins A and E in vegetable fats, and vitamin D in animals. In pharmacology, sterols are used to produce steroid hormones, as well as for the synthesis of vitamin D and other medications.

Interaction with other elements:

Sterols are ideal solvents for carotene (provitamin A), as well as for vitamins K, E and D. In addition, sterols also perform a transport function in the body. They transport proteins [26] to all human organs and tissues.

Signs of a lack of sterols in the body

- atherosclerosis (with a lack of phytosterols);
- fast fatiguability;
- nervous exhaustion;
- sudden mood swings;
- decreased sexual function;
- poor condition of nails;
- hair fragility;
- hormonal imbalance;
- decreased immunity;
- premature aging.

Signs of excess sterols in the body

- atherosclerosis (excess cholesterol);
- increased blood clotting;
- activation of the development of gall and liver stones;
- weakening of the osteochondral apparatus;
- increased blood pressure;
- pain in the heart area;
- changes in the functioning of the liver and spleen.

Factors influencing the amount of sterols in the body

The main factor influencing the content of phytosterols in the body is food. Zoosterols can be formed from foods of carbohydrate origin and fats, and also enter our body with food. Physical inactivity leads to the accumulation of sterols in the body, but at the same time reduces their absorption.

Sterols for beauty and health

Unfortunately, most of the fair sex, in pursuit of the desired volumes, refuse to consume fats - sources of sterols. On the one hand, this is a really real chance to lose weight. But it justifies itself only if excess weight is really present and prevents a person from leading an active lifestyle.

Otherwise, there is a risk of becoming irritable, dull hair, dry skin and brittle nails. In addition, a lack of sterols also leads to decreased visual acuity and problems with reproductive function.

You can cope with the consequences of a low-fat diet only if you have a balanced intake of sterols, eating both animal and vegetable fats.

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