

# Polyunsaturated fatty acids - description, benefits, effect on the body and the best sources

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**Abstract.** There are substances in nature that we primarily need. These essential elements include polyunsaturated fatty acids.

The body cannot produce these substances on its own. Therefore, experts recommend being especially attentive to sufficient levels of them in the body.

## A little history

The discovery of polyunsaturated fatty acids by science is associated with research that dates back to the twenties of the last century. Danish scientists have come to an amazing, and even a little strange, conclusion.

It turned out that the indigenous people of the North, who ate food rich in fats from fish and marine animals, practically did not suffer from atherosclerosis. Moreover, their blood cholesterol levels always remained normal.

As it later turned out, fish oil, which Eskimos regularly eat to this day, has special medicinal properties and is part of polyunsaturated fatty acids.

*Keywords:* polyunsaturated fatty acids, general characteristics, daily requirement, digestibility, beneficial properties, signs of deficiency, signs of excess

## Products with the maximum content of PUFAs:

- Fish fat
- Sunflower oil [1]
- Wheat germ oil [2]
- Peanut butter [3]
- Soybean oil [4]
- Olive oil [5]
- Red caviar
- Fresh salmon
- Fresh herring
- Mackerel
- Eggs [6]
- Flax seed
- Pine nuts
- Walnut [7]
- Sprouted wheat grains

## General characteristics of PUFAs

Polyunsaturated fatty acids (PUFAs) are a group of unsaturated fatty acids that have multiple covalent bonds between carbon atoms. Today, there are two main groups of PUFAs: omega-3 [8] and omega-6 [9].

The combination of these acids is known as “vitamin F” [10]. The human body cannot independently synthesize PUFAs and vitamin F in particular, so it is extremely important to consume the right amount of these substances with food.

The main representatives of polyunsaturated fatty acids: linolenic acid, arachidonic, eicosapentaenoic and docosahexaenoic acids. A high content of such substances is found in vegetable oils, fish, seeds and some cereals.

### **Daily requirement for PUFAs**

A person needs about 2.5 grams of unsaturated fatty acids per day. This amount of fatty acids is contained, for example, in 20-30 grams of vegetable oil. The optimal ratio of these elements of plant and animal origin in the diet is defined as 4:1.

### **The need for PUFAs increases:**

- during pregnancy [11];
- when playing sports and heavy physical labor [12];
- for diseases: atherosclerosis [13], diabetes [14], prostatitis [15] and skin problems;
- in the cold season;
- when living in the northern regions.

### **The need for PUFAs decreases:**

- for stomach pain;
- for heartburn;
- for skin allergic rashes.

### **Digestibility of PUFAs**

PUFAs are best absorbed from cold-pressed vegetable oils: sunflower, soybean, olive, etc., as well as from brown rice, corn [16], peanuts, nuts and fish oil.

It must be remembered that during heat treatment, vegetable oils lose their beneficial properties.

### **Beneficial properties of PUFA and its effect on the body**

- lowering blood cholesterol levels [17];
- normalization of blood pressure;
- neutralization of inflammatory processes in the body [18];
- prevention of thrombosis;
- positive effect on the reproductive system of the body;
- treatment of certain skin diseases, such as acne;
- construction of complete cell membranes in the body;

- burning of saturated fats in the body, resulting in weight loss.

It is worth noting that effective treatment of atherosclerosis is almost impossible without the appropriate amount of PUFAs in the body.

As is known, atherosclerosis in the human body is a consequence of elevated cholesterol levels in the blood. The main method of preventing this disease has long been considered the partial or complete elimination of fats from the diet.

At the time of the research, Danish scientists found that the problem of the spread of atherosclerosis among the population is associated with a lack of PUFA consumption!

The positive effect of vitamin F (a combination of Omega 3 and Omega 6) allows cholesterol to acquire a soluble form and be eliminated from the body.

PUFAs promote the formation of cell membranes. They prevent pathogenic microbes from entering the skin, and also help retain moisture in the skin, maintaining its elasticity.

### **Interaction with other elements**

It is less easily absorbed when a large amount of carbohydrates enters the body [19]. However, consuming it with foods rich in proteins [20] has the opposite effect. Enhances the effect of vitamins A, B, D, E [21-24].

### **Signs of a lack of PUFAs in the body:**

- acne and dry skin;
- split ends;
- dull, flaking nails.

The following can become much more dangerous to human health and even life:

- elevated cholesterol levels;
- blood clot formation.

### **Signs of excess PUFAs in the body:**

Excess polyunsaturated fatty acids have virtually no pronounced negative consequences. Quite rare signs of excess PUFAs can be allergic reactions [25], as well as stomach pain.

### **Factors influencing the content of PUFAs in the body**

First of all, it is worth remembering that our body is not able to synthesize PUFAs on its own, so it is very important to give the body these nutritional components along with food in the right quantities.

In addition, today there are opportunities to further increase the level of PUFAs in the body, for example, regular consumption of fish oil capsules.

## PUFAs for beauty and health

The role of polyunsaturated fatty acids for the beauty and health of the body is truly difficult to overestimate. A sufficient level of these elements in the human body means optimal body weight, beautiful hair and nails [26,27], elastic skin and a healthy cardiovascular system.

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Received 04.03.2019

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