Fats - description, benefits, effects on the body and the best sources

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Abstract. The article discusses the main properties of fats and their effects on the human body. A systematic review of modern specialized literature and current scientific data was carried out. The best natural sources of fats are indicated. The use of fats in various types of medicine and the effectiveness of their use in various diseases are considered. The potential adverse effects of fats on the human body under certain medical conditions and diseases are analyzed separately.

Key words: fats, benefits, harm, beneficial properties, contraindications, sources

One of the most important components of a living cell is fat. This concentrate of energy and vitality of the body helps to survive difficult times and unfavorable natural conditions. Lipids are divided into two large groups: **animal fats** and **vegetable oils** . In addition, they are divided into **simple** and **complex** , and can be *harmful* or *beneficial* .

General characteristics of fats

Fats are organic compounds responsible for the “reserve fund” of energy in the body. Lipids supply the body with important polyunsaturated fatty acids Omega 3 and Omega 6, arachidonic acid , linolenic acid, linoleic acid, which are not produced independently in the body. The main classes of lipids are triglycerides, sterols and phospholipids.

1. **Triglycerides** . These include saturated and unsaturated fatty acids, consisting of glycerol and three carbon chains. Here are examples of products in which they are contained in large quantities:
   Unsaturated fatty acids - fish oil, nut oils, seeds, sunflower, olive, corn, etc. – are very important for maintaining the health of the entire body. Saturated fatty acids are usually found in animal foods. For example, meat of various animals, cheese and milk.
2. **Sterols** are present in almost all tissues of animals and plants. Based on their sources, sterols can be divided into: zoosterols (from animals), phytosterols (from plants), and mycosterols (from fungi). The main sterol in the animal world is cholesterol, the most popular and controversial type of fat for the body. It is found in fatty meat, butter [1], liver, eggs [2] and other high-fat foods. As for plant sterols, the most common one is sitosterol . Also, the plants are rich in stigmasterol and brassicasterol . This set of sterols is present in soybean oil and rapeseed oil.
3. **Phospholipids** . They consist of glycerol , phosphoric acid and two carbon chains. Phospholipids are an important part of cell membranes. They provide the plastic properties of cell membranes, while cholesterol provides them with rigidity and stability. Phospholipids serve as the main source of phosphoric acid necessary for human life.

Foods rich in fats

See Appendix 1.

The body's daily requirement for fats

Modern dietetics indicates that to provide the body with a sufficient amount of energy, the amount of fat in our diet should be at least 30%. It is worth considering that 1 gram of fat is equal to 9 kcal. It is recommended to consume 10% saturated fats and 20% unsaturated fats. The permissible daily intake of cholesterol for a healthy person should be no higher than 300 mg, and for a person suffering from cardiovascular diseases it is calculated according to the doctor’s recommendations.

The need for fat consumption increases:

- Hard physical work is impossible without sufficient consumption of fatty foods, which keep the body feeling full longer and are high in calories.
- Cold season. Cold forces you to spend additional energy on heating; in addition, adipose tissue perfectly protects the body from hypothermia.
- Pregnancy and lactation. During this period, significant changes occur in the woman’s body, and some of the fat is used to feed the child.
- A lack of fat-soluble vitamins in the body is a signal from the body about an additional need for fat-containing foods, except, of course, the vitamins themselves.
- Lack of energy. Decreased libido.

The need for fat consumption is reduced:

- With increased body weight. The amount of fat consumed must be reduced, but not eliminated from the diet completely!
- When living in a hot climate, as well as the onset of the warm season.
- Performing work related to mental work requires carbohydrate foods, but not fatty foods.

Digestibility of fats

As mentioned above, all fats are divided into vegetable and animal. From medical research materials it became known that vegetable fats are absorbed faster than animal fats. This is due to the fact that their chemical bonds are less resistant to the effects of gastric juice. Most often, vegetable fats are used to quickly obtain energy. Animal fats keep you feeling full longer due to their slow absorption. Statistics show that men prefer to consume more animal fats, while women are fans of plant fats.

Fats and health

Conventionally, nutritionists divide all fats into **healthy** and **harmful** for the body. Healthy fats are polyunsaturated and monounsaturated fatty acids that are found in vegetable oils, as well as in fatty fish and egg yolk (lecithin). As for harmful fats, these include fats obtained as a result of cracking oil refining, fats that have been subjected to prolonged heating, as well as fats obtained from the processing of Genetically Modified Organisms (GMOs). Harmful fats are usually found in margarine, mayonnaise, cooking oil and products containing them.

Beneficial properties of fat and its effect on the body

The construction of cell membranes, the synthesis of sex hormones, the absorption of vitamins A, D, E, K are just some of the important functions that fat performs in the human body. Fat protects our body from cold, plays the role of a “safety cushion” for the heart [3], liver [4], kidneys [5] during various bodily injuries, and provides energy during a long hunger strike. In addition, fat is essential for the normal functioning of our brain [6] and nervous system.

Interaction with essential elements

As you might guess, essential elements are substances and compounds that can interact with each other. For fats, these essential elements are fat-soluble vitamins. The first on this list is vitamin A. It is found in foods such as carrots, persimmons, bell peppers, liver, sea buckthorn berries, as well as egg yolks. [7,8,9,10] Thanks to it, our body has the ability not only to resist all kinds of infections, but can also present itself in the best possible way. Imagine: healthy skin, luxurious hair, sparkling eyes, and most importantly - a Good Mood! And all this is the result of consuming vitamin **A.** [eleven]

Now regarding vitamin D. This vitamin provides an invaluable service to our osteochondral system. Previously, when a person did not receive the amount of vitamin D due to him, he fell ill with a disease such as rickets. One can guess what a person looked like at this time without further description. Vitamin D is found in foods such as extra virgin olive oil, fish oil, liver, and can also be produced by our bodies with sufficient exposure to sunlight. Thanks to exposure to the sun, a person not only tans, but also stores up much-needed vitamin D. [12] But as mentioned earlier, these vitamins can only be absorbed in the presence of a solvent fat. Consequently, a lack of fat can lead to exhaustion of the entire body.

Dangerous properties of fat and warnings

Signs of excess fat

Now we have to discuss such an important problem for human health as excess fat. Since modern society has elements of physical inactivity, the result of this phenomenon is excessive deposition of fat in the body, or simply obesity. As a result of this, the following changes occur in the human body:

- Blood clotting increases;
- The processes of formation of liver and gallstones are activated;
- Atherosclerosis develops;

- Degenerative processes are observed in the liver, kidneys and spleen;
- Well, to top off the bouquet, there is an increase in blood pressure, load on the heart, as well as changes in the osteochondral apparatus.

Signs of low fat

Lack of fat consumption affects not only the fact that a person does not receive the amount of energy he needs for life, but it is even more dangerous for the nervous system. As a result of fat restriction, or when fat balance is disturbed, a person develops so-called exhaustion of the nervous system. This is due to the fact that the fat-soluble vitamins they eat (such as vitamin A and D) are not able to be absorbed by the body. And the consequence of this vitamin fast, in addition to depletion of the nervous system itself, is also atrophic changes in the eyes, problems with nails, hair, skin, as well as problems with the reproductive system. In addition, with a lack of fat intake, there is a decrease in the body's resistance to all kinds of infections, hormonal imbalance, and early aging of the body.

Factors affecting body fat content

The main factor responsible for the accumulation of fat in the body is **physical inactivity** . This is followed by the so-called lipid metabolism disorder. This disorder, in addition to fat deposits, can also be the cause of early atherosclerosis. **Interesting fact** : residents of Japan, China and the Mediterranean, who consume large quantities of greens and seafood, do not suffer from this disorder.

The next factor affecting body fat is **stress** . Because of it, people stop feeling their body, and it gives them this trick with the appearance of excess weight.

The third factor is **hormonal** . Disorders of fat metabolism are often associated with an increase in estrogen levels in the body.

Cholesterol. Harm and benefit

So much has been said and written about him! For some, cholesterol becomes enemy number 1 in the fight for health and longevity. However, according to many medical sources, cholesterol in optimal amounts is not harmful. It is simply necessary for our body. Cholesterol is necessary for normal blood clotting. It is responsible for the integrity of the cell membrane of red blood cells. Plays an important role in the functioning of brain tissue, liver and nervous system. The body is able to synthesize cholesterol on its own from incoming nutrients. And only a certain amount (about 25%) enters the body with food.

Excessive consumption of fatty foods can lead to the deposition of excess cholesterol on the walls of blood vessels. This leads to the development of atherosclerosis, which is the main cause of starvation of all cells of the body, the access of blood to which was blocked by cholesterol deposits. Therefore, to avoid atherosclerosis, it is necessary to reduce fat intake to a reasonable minimum.

Fats in the fight for slimness and beauty

Sometimes people who want to lose weight completely exclude fats from their diet. At first, losing weight can be pleasing, but then, due to the fact that the body does not receive enough important vitamins and microelements, unpleasant symptoms may appear:

1. irritability;
2. dry skin;
3. brittle hair and nails.

It turns out that healthy fats play an important role in metabolic rate.

To maintain health, it is also necessary to maintain the ratio between fats. In this case, Omega-3 and Omega-6 should be in a ratio of 1:2. And the introduction of vegetable oils into the diet will prevent the formation of early wrinkles and will be an excellent prevention of dry skin and loss of elasticity. [13]

If there is a lack of body fat, it is necessary to consume such an amount of fat that some of it is stored in reserve. If you need to reduce your weight, it is better to eat fatty foods in the first half of the day. In this case, the released energy will not be put aside “for a rainy day”, but will immediately go to its destination.

Table 1

Top 100 natural sources _ fat

The number of grams per 100 g of product is indicated [14,15]

No.	Product	g in 100 g
1	Almond oil 100	100
2	Raw beef fat	100
3	Mustard oil	100
4	Walnut oil	100
5	Hazelnut oil	100
6	Cottonseed oil	100
7	Oat oil	100
8	Palm oil	100
9	Olive oil	100
10	Cacao butter	100
eleven	Sunflower oil	100
12	Wheat germ oil	100
13	Canola oil	100
14	Shea butter (karite)	100
15	Rice bran oil	100
16	Raw sardine fat	100
17	Pork fat (pork fat), raw	100
18	Raw herring fat	100
19	Corn oil	100
20	Apricot oil	100
21	Peanut butter	100
22	Avocado oil	100
23	Sesame oil	100
24	Babassu oil	100
25	Raw lamb fat	100
26	Salmon oil raw	100
27	Soybean oil	100

28	Poppy oil	100
29	Cod liver oil, raw	100
thirty	Safflower oil	100
31	Grape seed oil	100
32	Flaxseed oil	100
33	Raw goose fat	99.8
34	Turkey fat, raw	99.8
35	Duck fat raw	99.8
36	Raw chicken fat	99.8
37	Butter	99.5
38	Rendered pork lard	99.5
39	Coconut oil	99.1
40	Raw pork fat	94.2
41	Pork lard without layer, raw	88.7
42	Margarine	80.2
43	Walnut drank	79.6
44	Roasted macadamia nut	76.1
45	Macadamia nut	75.8
46	Mayonnaise	74.9
47	Pecan	72
48	Raw pork cheek	69.6
49	Pine nut without shell	68.4
50	Brazilian nut	67.1
51	Walnut	65.2
52	Unsweetened coconut flakes	64.5
53	Roasted hazelnuts	62.4
54	Unroasted sesame	61.2
55	Fresh hazelnuts	60.8
56	Black Walnut	59.3
57	Chicken egg yolk, powder	59.1
58	Butternut	57
59	Pork lard with a layer of raw	53
60	Roasted almonds	52.5
61	Sunflower seeds, peeled	51.5
62	Peanut paste	51.4
63	Beechnut	50
64	Fresh almonds	49.9
65	Roasted, peeled sunflower seeds	49.8
66	Roasted peanuts	49.7
67	Peanuts raw	49.2
68	Peeled pumpkin seeds	49.1
69	Hemp seed	48.8
70	Roasted sesame	48

71	Roasted cashews	46.4
72	Pepperoni sausage	46.3
73	Roasted pistachios without salt	45.8
74	Roasted salted pistachios	45.8
75	Fresh pistachios	45.3
76	Cashew raw	43.9
77	Foie gras canned	43.8
78	Dark chocolate (70-85% cocoa)	42.6
79	Flaxseed	42.2
80	Poppy seeds	41.6
81	Raw turkey skin	38.9
82	Dark chocolate (60-69% cocoa)	38.3
83	Sesame flour	37.1
84	Mustard seeds ground mustard	36.2
85	Cooked pork tail	35.8
86	Blood sausage	34.5
87	Cream cheese	34.4
88	Raw goose meat	33.6
89	Raw pork tail	33.5
90	Fresh coconut meat	33.5
91	Corn chips without salt	33.4
92	Boiled chicken skin	33
93	Dove dark chocolate	32.5
94	Nutmeg spice, ground	32.4
95	Raw chicken skin	32.4
96	Gruyère cheese	32.3
97	Colby cheese	32.1
98	Chocolate white	32.1
99	Dove milk chocolate	31.7
100	Salami	31.7

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The HTML version of the article is available on the foodplus.info website.

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Received 03.04.18

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