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EFFECT OF SPROUTED FLAX SEEDS ON THE BODY'S REACTIVITY

Abstract: This article examines the influence of sprouted flax seeds on the body's reactivity, biochemical composition, benefits and harms of flax seed. As well as the percentage of fatty acids in flaxseed oil is compared with its content in other vegetable oils. The question of the possibility of using flax seeds for food and the content of cyanogenic glycosides in them is considered.

Key words: flax seeds, lipids, fatty acids, linolenic acid, plant fatty oils, Food and Drug Administration (FDA).

Due to its unique properties, flax seeds attract close interest as a source of biologically active substances necessary for functional nutrition and maintaining active human health. They are rich in essential polyunsaturated fatty acids, dietary fiber, complete protein, polypeptides and lignansbelonging to the class of phytoestrogens that support the most important physiological functions of the human body. It has always been believed that flax seeds are one of the most useful products. They are rich in fiber, fatty acids and trace elements. Therefore, flax seeds are an integral part of proper nutrition - they are added to various salads and drinks, and many people eat them for nothing. The composition of flaxseed of Canadian varieties, which are the overwhelming majority in world production, is as follows: fat-41%, protein-21%, fiber-28%, aromatic acids, sugars, lignin and hemicellulose-6%, ash residue-4%. The composition of flaxseed varies depending on the variety, growing environment, and processing methods of flax.

A very significant part of flax seeds are lipids. Lipids are the components of cells that are difficult to dissolve in water. Fatty oil consists of triglycerides (natural organic compounds full of glycerol esters and monobasic fatty acids)and a mixture of fatty acids such as linoleic, linolenic, oleic, palmitic and stearic. The content of fatty acids in vegetable oils(in %) is given in a Table below.

Oil type	Saturated fatty acids	Monosaturated fatty acids	Polysaturated fatty acids	
		Oleic acid (Omega-9)	Linoleicacid (Omega-6)	α-Linolenicacid (Omega-3)
Flax	8-10	14	24-49	22-44
Soy	7,1-15,2	32,6-35,5	52-56	3-8
Olive	oil 9,0-14,3	71-86	4,2-11,8	-
Sunflower	9	33,3	39,8-60	-
Corn	oil 11,9	44,9-45,3	41-48	-
hemp	oil 4,5	14	65	16

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Plant fatty oils are a concentrated energy and building reserve, concentrated in seeds and other plant organs. The fat content in seeds and fruits of plants varies widely - from 2 to 70% and depends on the geographical location and climatic conditions in the area of their growth. The main role of reserve fats in the plant is to use them for nutrition during seed germination and embryo development; in addition, they play an important role as protective substances that help the plant to tolerate adverse environmental conditions, in particular, low temperatures. Unsaturated fatty acids have the greatest calorific value, so plants of northern latitudes contain them in the greatest quantities. In tropical plants, on the contrary, saturated fatty acids predominate, which are in a liquid state at high temperatures and solidify at low temperatures. Flax seed lignans. Flaxseed is one of the richest sources of lignans belonging to the class of phytoextrogens. These are substances of plant origin that exhibit estrogen-like activity in the human body.The main lignan of flaxseed – secoisolaracyresinoldiglycoside (SDH) in the human body under the action of intestinal microflora metabolizes into enterolactone and enterodiol.

Numerous epidemiological studies have shown that flaxseed lignans reduce the risk of developing hormone-dependent tumors or slow their growth, and exhibit significant antioxidant activity. However, with regard to the use of flax seeds in food, you should not get carried away with them, as this can cause serious health problems. Cyanide is a poison that acts quickly and can be fatal.

There is a link between cyanide and flax. As it turned out, in addition to essential fatty acids, flax seed contains a compound called amygdalin, which is one of the "cyanogenic glycosides" that, when decomposed (when destroyed in the digestive tract), can produce cyanide gas. Most of it is contained in ground flaxseed. Experts of the European Food Safety Agency (EFSA) have published a report in which they warn that the consumption of only 1.3 g (one-third of a teaspoon) of ground flax seed can pose a danger to the health of a small child, as the amount of cyanide in his body will reach dangerous levels. An adult may experience intoxication if they eat 10.9 g (three teaspoons) of flax seeds at a time. If the seed was crushed using a blender, mortar, or by hand, cyanide release occurs several times faster. At the same time, the more crushed the seed is, the more cyanide it emits. Signs of cyanide poisoning are as follows: headache, absent-mindedness, agitation of the body, irregular heartbeat, breathing problems appear. With prolonged use of flax seeds in quantities exceeding the daily norm, the nervous system is affected. In the most severe cases, cyanide poisoning can be fatal.

The EFSA report compared the cyanide content of various products. Flax seeds, as well as bitter almonds, are called one of the "foods with the highest cyanide levels." The amygdalin they contain decomposes to release hydrogen cyanide, an aqueous solution of which is known as hydrocyanic acid. But not everything is as bad as it may seem at first glance. Scientists only warn about the sad consequences in the case of abuse of flax seeds and talk about the worst-case scenario. In fact, you can include this product in your diet, but in reasonable doses. Mayo Qinic.org writes that no cyanide-related side effects were reported after taking flaxseed supplements at the recommended daily highs.

The Food and Drug Administration (FDA) reports that most manufacturing processes wash out this type of cyanide because cyanogenic glycosides break down when exposed to elevated temperatures. Culinary processing (cooking in bread, muffins, etc.) also helps to eliminate the risk of poisoning. To the question of whether flax seeds lose their useful properties during heat treatment, there is a clear answer. In studies conducted in the United States, the following conditions were set: flaxseeds were crushed and added to food using an oven at a temperature of at least 150 °C. The shortest baking time was 15 minutes, and the longest was 3 hours. In all cases, linolenic acid (Omega-3) contained in

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linseed oil remained stable and unchanged. Currently, flax seeds are considered a functional food product, the functional ingredients of which have a proven physiological effect on the human body.

Conclusions

1. The composition of flaxseed determines its value as a dietary product, but you should not eat seeds directly from the plant that have not been properly processed.

2. It is recommended that an adult consume no more than 10 grams of flaxseed or flaxseed flour daily to avoid possible side effects.

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