

Oils Rich in Linoleic Acid

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Edible oils are biological mixtures of plant origin, containing ester mixtures derived from glycerol with a chain of fatty acids. They represent one of the major components of human diets and cover approximately 25% of average caloric intake. The content of fatty acids is an important parameter for determining nutritional value, its application and stability.

Composition of fatty acid in oils is most often determined by modified acid-catalyzed esterification and trans-esterification of free fatty acids and glycerides, with the use of gas chromatography. The reference mixture of methyl esters of fatty acids is used to determine their relative percentage (area %).

Linoleic acid in different oils

An important feature common to most plant origin oils is a high percentage of unsaturated fatty acids and the triacylglycerols, which make them prone to oxidative deterioration. Thus it is crucial to know the accurate composition of fatty acids in order to determine possible adulterations and overall stability of the product.

Linoleic acid (alongside oleic acid) represents major unsaturated fatty acid present in practically all oils. Peanut, cotton and corn oils display higher content of unsaturated fatty acids (more than 75%) than saturated ones. Although sunflower oil contains significant area percentage of linoleic acid, the ratio of saturated and unsaturated fatty acids is considered to be healthy.

Area percentage of linoleic acid in borage oil is 38.47%, in evening primrose oil is 74%, in canola oil 20.12%, in corn oil 59.27%, in sunflower oil 71.17%, in cottonseed oil 56.35%, in linseed oil 15.18%, in soybean oil 56%, in olive oil, 7%, in extra olive virgin oil 8.64%, in olive pomace oil 10.33%, in peanut oil 31%, in rice bran oil 36.28%, in palm oil 10.62% and in palm kernel oil 2.76%.

Effectiveness of oils rich in linoleic acid

As health-conscious consumers are increasingly demanding milk with higher proportions of healthy fatty acids, influencing the diet of dairy cows is a way to change the fatty acid profile of milk fat. Conjugated linoleic acid in milk is a result of either ruminal biohydrogenation of linoleic acid as an intermediate product, or endogenous synthesis from vaccenic acid, which is another intermediate product.

Oils rich in linoleic acid have shown more effectiveness in enhancing contents and yield of conjugated linoleic acid in milk fat of dairy cows fed high forage diets, when compared to oils containing linolenic acid. An advantage of adding oils to the cow's diet is an increase of energy density and energy intake by the animal.

Name	% Linoleic acid [†]
Safflower oil	78%
Grape seed oil	73%
Poppyseed oil	70%
Sunflower oil	68%
Hemp oil	60%
Corn oil	59%
Wheat germ oil	55%
Cottonseed oil	54%
Soybean oil	51%
Walnut oil	51%
Sesame oil	45%
Rice bran oil	39%
Pistachio oil	32.7%
Peanut oil	32%
Canola oil	21%
Egg yolk	16%
Flax = Linseed oil	15%
Lard	10%
Olive oil	10%
Palm oil	10%
Cocoa butter	3%
Macadamia oil	2%
Butter	2%
Coconut oil	2%
	†average val

Sources

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Further Reading

- [All Linoleic Acid Content](#)
- [Linoleic Acid - What is Linoleic Acid?](#)
- [Differences between Safflower Oil and Conjugated Linoleic Acid](#)

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