Flax Seed Oil

Supplemental Source of N-3 Fatty Acids

Essential fatty acids fall into two broad classes, described as N-3 and N-6 fatty acids. These polyunsaturated fatty acids possess double bonds beginning at the third or fifth carbon atom from the methyl end of the carbon chain. Mammals cannot insert double bonds at these positions of fatty acids. Thus, N-3 and N-6 fatty acids cannot be synthesized from simple precursor fatty acids and they are considered dietary essentials. Alpha linolenic acid (18:3n-3), ALA, is the parent compound of all long chain N-3 polyunsaturated fatty acids, including eicosapentaenoic acid (22:5n-3, EPA) and decosahexaenoic acid (22:6n-3 DHA). ALA possesses 18 carbon atoms and 3 double bonds, hence the chemical name, 9,12,15, octadecatrienoic acid.

Function of N-3 Fatty Acids

Diets enriched in alpha linolenic acid, such as the Mediterranean diet, have been the subject of nutrition and medical research[1] and beneficial effects note.[2] Polyunsaturated fatty acids perform multiple functions. They are incorporated into membrane lipids to establish fluidity and membrane integrity. As precursors of prostaglandins, thromboxanes and leukotrienes, polyunsaturates are essential to regulating most physiologic functions, including inflammation, platelet aggregation, pain and others. EPA and DHA possess protective effects on the cardiovascular system, and function as modulators based upon their conversion to eicosanoids. In general, prostaglandins and thromboxanes synthesized from N-3 fatty acids, have a moderating influence on the body, and tend to return processes to equilibrium. For example, EPA leads to PGE3, a prostaglandin with 3 double bonds in its side chain. EPA is also converted to Thromboxane TX3. Both of these eicosanoids are believed to counterbalance the proinflammatory eicosanoids, such as PGE2 and Thromboxane TX4, formed from N-6 fatty acids.[3,8] For example, PGE3 and PGI3 prevent platelets from sticking and aggregating and they balance the parasympathetic nervous system. In contrast, PGE2 and Thromboxane TX4 from N-6 fatty acids increase the inflammatory response and respond to the sympathetic nervous system. Alpha linolenic acid has been found to support proper platelet function[4] and normal serum cholesterol levels.[5] Low levels of ALA in fat tissue are associated with decreased glucose tolerance.[6] When elderly patients deficient in N-3 fatty acids were supplemented with pure ALA, lymphocytic response to mitogens improved.[7] Mice that were fed a diet enriched in alpha linolenic acid increased the activity of cytotoxic T-cells.[8] Flax seed oil may help balance joint health.[9] N-3 fatty acids also play a role in the development and function of the brain and retina.[10] N-3 fatty acids helps normalize immune functioning by inhibiting 5-lipoxygenase activity and reducing platelet-derived activity factor.[11]

N-3 Fatty Acids in the Diet

Americans presently consume about 18% of the amount of N-3 fatty acids available in the diet a century ago. It has been estimated that adults require 800 – 1,100 mg of ALA for health.[12] However, no RDA has been established for N-3

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essential fatty acids. The consumption of omega-3 fatty acids is relatively low in the typical Western diet compared to omega-6 fatty acids. N-6 and N-3 fatty acids compete for an enzyme involved in fatty acid elongation and desaturation, eicosanoid production and incorporation into membrane lipids. A key enzyme in this conversion is the rate-limiting step catalyzed by delta-6-desaturase. Excessive linoleic acid slows the desaturation of ALA. Factors correlated with decreased delta 6-desaturation include diabetes; stress-related hormones; deficiencies of zinc and vitamin B6; excessive saturated fatty acids; trans fatty acids and cholesterol and possibly aging and high alcohol consumption.[13] *In vitro* studies link viral infections, radiation and chemical carcinogens to 6-desaturase inhibition.[14] In lab animals there is an age-related decline in delta 6- desaturase.[15] Typical dietary sources of ALA are plant oils, especially flaxseed oil. DHA and EPA are most often concentrated in the fat of oily, cold water fish.

Flax seed as a Supplemental Source of N-3 Fatty Acids

Flax seed oil represents one of the richest sources of ALA. Typically, flaxseed oil contains approximately 60% alpha ALA, and about 20% each of linoleic acid and oleic acid making up the difference. Recent research indicates that ALA can alter n-6/n-3 ratios[16] and can be effectively converted to EPA in healthy humans[17] although increased production of DHA was not observed. Our oil is prepared from certified organically grown flax seed which is cold-pressed to preserve maximum nutritional benefits.

References

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Supplement Facts

Serving Size: 1 Softgel Capsule

	Amount Per Serving	% Daily Value
Calories	10	
Calories from Fat	10	
Total Fat	1 g	2%*
Saturated Fat	0 g	0%*
Cholesterol	0 mg	0%*
Flax Seed Oil	1,000 mg	†
Alpha-Linolenic Acid (omega-3)	440 mg	†
Linoleic Acid (omega-6)	120 mg	†
Oleic Acid (omega-9)	140 mg	†

*** Percent Daily Values based on a 2,000 calorie diet**
† Daily value not established

Ingredients: Flax seed oil, capsule shell (gelatin, glycerin, water and carob)

Each softgel capsule contains 1,000 mg of pure flax seed oil, cold pressed from certified organically grown flax seed, providing a natural source of alpha linoleic acid and oleic acid.

This product is gluten and dairy free.

RECOMMENDATION: One (1) softgel capsule with each meal as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN
Store in a cool, dry area.
Sealed with an imprinted safety seal for your protection.

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