



Flax Seed

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Literature Education Series On Dietary Supplements

By Gene Bruno, MS, MHS – Dean of Academics, Huntington College of Health Sciences

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Flax seed naturally contain a complex of different categories of fatty acids, including alpha-linolenic acid (omega-3), linoleic acid (omega-6), and oleic acid (omega-9). Much of Flax seed's benefits are a function of its alpha linolenic acid (ALA) content, and the fact that ALA can be converted by the body into EPA—the same omega-3 found in fish oil. As a matter of fact research has found that supplementation with Flax seed oil can effectively increase EPA concentrations in tissues.¹ Lignans, also found in Flax seed, account for various benefits offered by this plant. Studies involving Flax seed have been conducted on its anti-inflammatory properties, its phytoestrogenic / anti-cancer properties, its anti-lupus properties, its cardiovascular enhancing properties, and its prostate supporting properties.

Anti-inflammatory properties

ALA can convert into EPA, and EPA, in turn, has the ability to convert into series-3 prostaglandins (prostaglandins are hormone-like substances) which have anti-inflammatory properties. Here's how it works: Many factors contribute to the complex course of inflammatory reactions, including the omega-6 fatty acid, arachidonic acid (AA). AA can be converted via an enzymatic process into pro-inflammatory substances, including series-2 prostaglandins, leukotrienes, and cytokines. In states of inflammation, it seems that O3FA is able to compete with AA for enzymatic metabolism, which results in less production of inflammatory substances.² Use of Flax seed oil in domestic food preparation has been able to reduce production of inflammatory cytokines.³

Phytoestrogenic / anti-cancer properties

Lignans with phytoestrogen properties are particularly abundant in Flax seed. When ingested in relatively large amounts, phytoestrogens have been shown to have significant estrogen modulating effects in animals and humans. There is epidemiological, laboratory and clinical evidence which indicates that phytoestrogens, have an anti-cancer effect on the breast.⁴ In fact, experimental studies in both animals and humans have demonstrated the anti-cancer effects of Flax seed.⁵ In fact, in 1998, the *Journal of clinical oncology* published an article which indicated that the consumption of Flax seed may be used as a secondary prevention method for breast cancer.⁶

Anti-lupus properties

Fish oils, a source of omega-3 fatty acids, have been shown to inhibit inflammatory mechanisms and modulate blood fats in the autoimmune disease, lupus nephritis.⁷ This led researchers to consider that Flax seed may also have similar benefits. In one trial, nine people with kidney damage due to Systemic lupus erythematosus (SLE) were fed increasing amounts of Flax seed for a total of twelve weeks.⁸ After examining the results, researchers concluded that 30 grams per day was the optimal intake for improving kidney function, decreasing inflammation, and reducing atherosclerotic development. Flax seeds also contain antioxidants, potentially helpful to those with SLE.⁹

Cardiovascular enhancing properties

In one study, 15 subjects with high serum cholesterol levels who were taking vitamin E, were given 15 grams of a flax seed supplement. After three months, serum total and LDL cholesterol levels were reduced significantly, but HDL cholesterol (the "good" cholesterol) did not change.¹⁰ Other research has also shown serum lipid level reduction, but fairly large amounts of Flax seed had to be consumed in these studies to emulate the same lipid-lowering effect of fish oils.¹¹ For example, in one study, young healthy adults given 50 g of Flax seed daily for 4 weeks, experienced an 8% reduction in plasma LDL cholesterol.¹² In a similar study, healthy female volunteers consuming 50 g of Flax seed daily for 4

weeks, experienced a 9% reduction in serum total cholesterol, and an 18% reduction in LDL cholesterol.¹³

Oxygen free radicals (OFRs) have been implicated in the development of atherosclerosis. Lignans possess anti-platelet activating factor activity (i.e., prevent blood platelets from clumping, thereby improving circulation) and antioxidant activity. In animal research, Flax seed reduced the development of aortic atherosclerosis by 46% and suppressed OFRs. Researchers concluded that “dietary Flax seed supplementation could, therefore, prevent hypercholesterolemia-related heart attack and strokes.”¹⁴

The elasticity of arteries is an important indicator of circulatory function, and diminishes as cardiovascular risk increases. Research has shown that obese people, who consumed a diet high in ALA from Flax seed oil, experienced a marked rise in arterial elasticity, reflecting a rapid functional improvement in the arterial circulation.¹⁵

Prostate supporting properties

Holistic physician, Jonathon Wright, MD, has found that Flax seed oil can play a key role in the treatment of an enlarged prostate.¹⁶ Some animal research is consistent with Dr. Wright’s clinical experience. In one study, rats with lifetime exposure to 5% Flax seed diets experienced a reduction in relative prostate weight and cell proliferation, suggesting potential protection against prostatic disease.¹⁷

Flax seed Supplementation

The potential benefits of Flax seed are many, but only if the right form of supplemental Flax seed is used. Although it is a good source of essential fatty acids, Flax seed oil supplements do not provide appreciable amounts of the valuable lignans. On the other hand, whole or ground Flax seed, though effective, is not especially palatable for many individuals. Perhaps the best option is a Flax seed powder in capsule form. Such a supplement provides the omega-3 fatty acids (as well as omega-6 & 9s) and the lignans. Although some of the aforementioned research utilized extremely high quantities of Flax seed, the nutritional value and certain beneficial results could be realized by consuming about 3000 mg (3 grams) daily.

References

1. Mantzioris E, et al, *Am J Clin Nutr* (1994) 59(6):1304-9.
2. Heller A, et al, *Drugs* (1998) 55(4):p487-96.
3. James MJ, Gibson RA, Cleland LG, *American journal of clinical nutrition* (2000) 71(1Suppl):343S-8S.
4. Brzezinski A, Debi A, *European journal of obstetrics, gynecology, and reproductive biology* (1999) 85(1):47-51

5. Thompson LU, *Bailliere's clinical endocrinology and metabolism* (1998) 12(4):691-705.
6. Goss PE, Sierra S, *Journal of clinical oncology* (1998)16(1):338-47.
7. Clark WF, Parbtani A, *American journal of kidney diseases* (1994) 23(5):644-7.
8. Clark WF, et al, *Kidney Int* (1995) 48:475-80.
9. Prasad K, *Mol Cell Biochem* (1997) 168:117-23.
10. Bierenbaum ML, Reichstein R, Watkins TR, *Journal of the American College of Nutrition* (1993) 12(5):501-4.
11. Harris WS, *Am J Clin Nutr* (1997) 65(5 Suppl):1645S.
12. Cunnane SC, et al, *Am J Clin Nutr* (1995) 61(1):62-8.
13. Cunnane SC, et al, *Br J Nutr* (1993) 69(2):443-53.
14. Prasad K, *Atherosclerosis* (1997) 132(1):69-76.
15. Nestel PJ, et al, *Arterioscler Thromb Vasc Biol* (1997) 17(6):1163-70.
16. Wright J, Bruno G, *The Smart Guide To Nutritional Medicine* (2000) Smart Publications, Petaluma, California.
17. Tou JC, Chen J, Thompson LU, *J Toxicol Environ Health* (1999) 56(8):555-70.



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