

FLAX: A WONDERFUL GIFT OF NATURE

Flax (also known as **common flax** or **linseed**) (binomial name: *Linum usitatissimum*) is a member of the genus *Linum* in the family [Linaceae](#). It is native to the region extending from the eastern Mediterranean to India and was probably first domesticated in the Fertile Crescent.

Description

Flax is an erect annual plant growing to 1.2 m (3 ft 11 in) tall, with slender stems. The leaves are [glaucous](#) green, slender [lanceolate](#), 20–40 mm long and 3 mm broad. The flowers are pure pale blue, 15–25 mm diameter, with five petals; they can also be bright red. The fruit is a round, dry capsule 5–9 mm diameter, containing several glossy brown seeds shaped like an apple pip, 4–7 mm long. In addition to referring to the plant itself, the word "flax" may refer to the unspun fibers of the flax plant.

Flax is grown both for its seeds and for its fibers. Various parts of the plant have been used to make fabric, dye, paper, medicines, fishing nets, hair gels, and soap. Flax seed is the source of linseed oil, which has uses as an edible oil, as a nutritional supplement and as an ingredient in many wood finishing products. It is also grown as an ornamental plant in gardens.

Flax seeds come in two basic varieties: (1) brown; and (2) yellow or golden. Most types have similar nutritional characteristics and equal amounts of short-chain omega-3 fatty acids. Flax seeds produce a vegetable oil known as flaxseed or linseed oil, which is one of the oldest commercial oils, and solvent-processed flax seed oil has been used for centuries as a drying oil in painting and varnishing

Nutritional value per 100 g			
Energy	2,234 kJ (534 kcal)	Pantothenic acid (B ₅)	0.985 mg (20%)
Carbohydrates	28.88 g	Vitamin B ₆	0.473 mg (36%)
Sugars	1.55 g	Vitamin C	0.6 mg (1%)
Dietary fiber	27.3 g	Calcium	255 mg (26%)
Fat	42.16 g	Iron	5.73 mg (46%)
Protein	18.29 g	Magnesium	392 mg (106%)
Thiamine (Vit. B ₁)	1.644 mg (126%)	Phosphorus	642 mg (92%)
Riboflavin (Vit. B ₂)	0.161 mg (11%)	Potassium	813 mg (17%)
Niacin (Vit. B ₃)	3.08 mg (21%)	Zinc	4.34 mg (43%)

Source: USDA Nutrient database

Flaxseeds are slightly larger than sesame seeds and have a hard shell that is smooth and shiny. Their color ranges from deep amber to reddish brown depending upon whether the flax is of the golden or brown variety. While whole flaxseeds feature a soft crunch, the nutrients in ground seeds are more easily absorbed.

Training to farmers on Flax cultivation:

240 youth were trained in cultivation of flax seeds and making of value added products out of them. The project area comprises four villages namely Mundla Kasampura, Parlia, Bhimpura, Dagariya and Nayagaon in Digod Tehsil of Kota District in Southeastern. The total area of these villages is around 28 sq. km. The training covered the following activities.

- i) Cultivation of Flax crop
- ii) Collection of flax seeds
- iii) Marketing of Flax seeds
- iv) Making of value added products from flax seeds like Biscuits & Namkeen etc
- v) Use and marketing of flax seed products.



Cultivation of Flax under SED's supervision

Health Benefits

Flaxseeds are rich in *alpha linolenic acid* (ALA), an omega-3 fat that is a precursor to the form of omega-3 found in fish oils called *eicosapentaenoic acid* or EPA. Since the fats are found in their isolated form in flaxseed oil, it is a more concentrated source of ALA than the seeds themselves (although it doesn't have the other nutrients that the seeds do). ALA, in addition to providing several beneficial effects of its own, can be converted in the body to EPA, thus providing EPA's beneficial effects. For this conversion to readily take place, however, depends on the presence and activity of an enzyme called *delta-6-desaturase*, which, in some individuals, is less available or less active than in others. In addition, delta-6-desaturase function is inhibited in diabetes and by the consumption of saturated fat and alcohol. For these reasons, higher amounts of ALA-rich flaxseeds or its oil must be consumed to provide the same benefits as the omega-3 fats found in the oil of cold-water fish.

Yet research indicates that for those who do not eat fish or wish to take fish oil supplements, flaxseed oil does provide a good alternative. A study published in the *Journal of Nutrition*

found that flaxseed oil capsules providing 3 grams of alpha-linolenic acid daily for 12 weeks-an amount that would be provided by 3 tablespoons of flaxseed oil a day-increased blood levels of EPA by 60% in a predominantly African-American population with chronic illness.

Anti-Inflammatory Benefits

Omega-3 fats are used by the body to produce Series 1 and 3 prostaglandins, which are anti-inflammatory hormone-like molecules, in contrast to the Series 2 prostaglandins, which are pro-inflammatory molecules produced from other fats, notably the omega-6 fats, which are found in high amounts in animal fats, margarine, and many vegetable oils including corn, safflower, sunflower, palm, and peanut oils. Omega-3 fats can help reduce the inflammation that is a significant factor in conditions such as asthma, osteoarthritis, rheumatoid arthritis, migraine headaches, and osteoporosis.

Omega-3-rich Flaxseeds Protect Bone Health

Alpha linolenic acid, the omega-3 fat found in flaxseed and walnuts, promotes bone health by helping to prevent excessive bone turnover-when consumption of foods rich in this omega-3 fat results in a lower ratio of omega-6 to omega-3 fats in the diet.(Griel AE, Kris-Etherton PM, et al. *Nutrition Journal*)

Other studies have shown that diets rich in the omega-3s from fish (DHA and EPA), which also naturally result in a lowered ratio of omega-6 to omega-3 fats, reduce bone loss. Researchers think this is most likely because omega-6 fats are converted into pro-inflammatory prostaglandins, while omega-3 fats are metabolized into anti-inflammatory prostaglandins. (Prostaglandins are hormone-like substances made in our bodies from fatty acids.)

In this study, 23 participants ate each of 3 diets for a 6-week period with a 3 week washout period in between diets. All 3 diets provided a similar amount of fat, but their ratio of omega-6 to omega-3 fats was quite different:

Protection Against Heart Disease, Cancer and Diabetes

Omega-3 fats are used to produce substances that reduce the formation of blood clots, which can reduce the risk of heart attack and stroke in patients with atherosclerosis or diabetic heart disease.

Omega-3 fats are also needed to produce flexible cell membranes. Cell membranes are the cell's gatekeepers, allowing in needed nutrients while promoting the elimination of wastes. While important for everyone, flexible cell membranes are critical for persons with diabetes since flexible cell membranes are much better able to respond to insulin and to absorb glucose than the stiff membranes that result when the diet is high in saturated and/or hydrogenated (trans-) fats. In the colon, omega-3 fats help protect colon cells from cancer-causing toxins and free radicals, leading to a reduced risk for colon cancer.

Flaxseeds Help Prevent and Control High Blood Pressure

Individuals whose diets provide greater amounts of omega-3 fatty polyunsaturated fatty acids-and flaxseed is an excellent source of these essential fats-have lower blood pressure

than those who consume less, shows data gathered in the International Study of Macro- and Micro-nutrients and Blood Pressure (INTERMAP) study.

The INTERMAP is a study of lifestyle factors, including diet, and their effect on blood pressure in 4,680 men and women aged 40 to 59 living in Japan, China, the U.S. and the U.K. Blood pressure was measured and dietary recall questionnaires were completed by participants on four occasions. Dietary data was analyzed for levels of omega-3 fatty acids from food sources including fish, nuts, seeds and vegetable oils.

Average daily intake of omega-3 fatty acids was 2 grams. Participants with a high (0.67% kcal) omega-3 fatty acid percentage of their daily calorie intake had an average systolic and diastolic blood pressure reading that was 0.55/0.57 mm Hg less, respectively, than participants with lower intake. Previous research has found that a decrease of 2 mm Hg reduces the population-wide average stroke mortality rate by 6 percent and that of coronary heart disease by 4%.

Flaxseed Provides Comparable Cholesterol-Lowering Benefits to Statin Drugs

In a study involving 40 patients with high cholesterol (greater than 240 mg/dL), daily consumption of 20 grams of ground flaxseed was compared to taking a statin drug. After 60 days, significant reductions were seen in total cholesterol, LDL cholesterol, triglycerides and the ratio of total to HDL cholesterol-in both groups. Those receiving flaxseed did just as well as those given statin drugs!

Body mass index, total cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, and the ratio of total cholesterol/HDL-cholesterol were measured at the beginning of the study and after 60 days.

In those eating flaxseed, significant reductions were seen in total cholesterol (-17.2%), LDL-cholesterol (-3.9%), triglycerides (-36.3%) and the ratio of total cholesterol/HDL-cholesterol (-33.5%) were observed in the diet+flax group, compared to baseline. Similar reductions were seen in those taking the statin. Benefits did not significantly differ between the two groups.

Flaxseed Oil Lowers Blood Pressure in Men with High Cholesterol

Greek researchers looked at the effect on systolic and diastolic blood pressure of a three-month trial during which 59 middle-aged men used either flaxseed or safflower oil in their daily diet.

Flaxseed oil is rich in the omega-3 fat, alpha-linolenic acid (ALA), which the body can metabolize into the cardioprotective long-chain omega-3 fatty acids, DHA and EPA, while safflower oil is a concentrated source of the omega-6 fat, linoleic acid (LA). The men received flaxseed oil supplying 8 grams of ALA daily or safflower oil providing 11 grams of LA per day.

Rich in Beneficial Fiber

Flaxseeds' omega-3 fats are far from all this exceptional food has to offer. Flaxseed meal and flour provides a very good source of fiber that can lower cholesterol levels in people with

atherosclerosis and diabetic heart disease, reduce the exposure of colon cells to cancer-causing chemicals, help relieve constipation and stabilize blood sugar levels in diabetic patients. Flaxseeds are also a good source of magnesium, which helps to reduce the severity of asthma by keeping airways relaxed and open, lowers high blood pressure and reduces the risk of heart attack and stroke in people with atherosclerosis and diabetic heart disease, prevents the blood vessel spasm that leads to migraine attacks, and generally promotes relaxation and restores normal sleep patterns.

A study published in the *Archives of Internal Medicine* confirms that eating high fiber foods, such as flaxseed, helps prevent heart disease. Almost 10,000 American adults participated in this study and were followed for 19 years. People eating the most fiber, 21 grams per day, had 12% less CHD and 11% less CVD compared to those eating the least, 5 grams daily. Those eating the most water-soluble dietary fiber fared even better with a 15% reduction in risk of CHD and a 10% risk reduction in CVD.

Flaxseed Puts the Brakes on Prostate Cancer Growth

Flaxseed, a rich source of omega-3 fatty acids and lignans, put the brakes on prostate tumor growth in men who were given 30 grams of flaxseed daily for a month before surgery to treat their prostate cancer. The 40 men taking flaxseed, either alone or along with a low-fat diet, were compared to 40 men only following a low-fat diet, and 40 men in a control group who did not alter or supplement their usual diet. Men who took flaxseed, as well as those who took flaxseed combined with a low-fat diet did the best.

Special Protection for Women's Health

Flaxseed meal and flour have been studied quite a bit lately for their beneficial protective effects on women's health. Flaxseed is particularly rich in *lignans*, special compounds also found in other seeds, grains, and legumes that are converted by beneficial gut flora into two hormone-like substances called *enterolactone* and *enterodiol*. These hormone-like agents demonstrate a number of protective effects against breast cancer and are believed to be one reason a vegetarian diet is associated with a lower risk for breast cancer. Studies show that women with breast cancer and women who are omnivores typically excrete much lower levels of lignans in their urine than vegetarian women without breast cancer. In animal studies conducted to evaluate lignans' beneficial effect, supplementing a high-fat diet with flaxseed flour reduced early markers for mammary (breast) cancer in laboratory animals by more than 55%.

Flaxseed Reduces Hot Flashes Almost 60%

Researchers recruited 29 postmenopausal women who had suffered from at least 14 hot flashes each week for at least one month, but would not take estrogen because of a perceived increased risk of breast cancer. After taking 40 grams (1.4 ounces) of crushed flaxseed each day for six weeks, the frequency of hot flashes decreased 50%, and the overall hot flash score decreased an average 57% for the 21 women who completed the trial. [J Soc Integr Oncol. 2007 Summer;5\(3\):106-12.](#)

Fend Off Dry Eyes

Dry eye syndrome (DES) afflicts more than 10 million Americans. Artificial tears offer only temporary relief. Expensive prescription drugs promise help, but at the cost of potentially serious side effects.

Could Mother Nature provide a cure? Yes, suggests research published in the *American Journal of Clinical Nutrition* involving nearly 40,000 female health professionals aged 45-84 enrolled in the Women's Health Study.

"These findings suggest that increasing dietary intake of omega-3 fatty acids may reduce the risk of dry eye syndrome, an important and prevalent cause of ocular complaints," Miljanovic and colleagues conclude. In addition to tuna fish, omega-3 fatty acids are richly supplied by other fatty fish (such as salmon, mackerel, halibut, sardines, and herring), flaxseeds and flaxseed oil. Due to concerns about mercury levels in tuna, to lower your risk of DES we recommend enjoying a variety of cold-water fish and adding flaxseeds and flaxseed oil to your Healthiest Way of Eating.

The Flax seeds can be used in following ways:

1. A teaspoon of ground flaxseed can be added to the breakfast cereal, where a nutty flavor is appropriate.
2. While making a sandwich, a teaspoon of ground flaxseed can be added to mustard or mayonnaise.
3. Flaxseed is often used as a galactagogue (food that stimulates milk production in lactating mothers).
4. A teaspoon of ground flaxseed can be blended to a cup of yoghurt.
5. While baking breads, muffins, cookies or other baked products, add ground flaxseed before baking.
6. Flaxseeds can be used to replace eggs in baking process by binding other ingredients together.
7. Sprouted flaxseeds are also edible with a slight spicy flavor and can also be added to salads, soups and vegetables.
8. Different parts of the plant can also be used to produce a tea which can be consumed for the various health advantages. Flaxseed tea is excellent for providing important health components such as omega fatty acids, lignans, and fibers that can help improve the health of the body.