

New FLAX FACTS

FLAX – A SMART CHOICE

by Dr. Diane H. Morris

Humans have been eating flax for thousands of years. Flax is a founding crop, being one of the first domesticated plants. Its cultivation likely began in the fertile valleys of the so-called Fertile Crescent in Mesopotamia about 8,000 to 10,000 years ago. Flax was valued in Ancient and Early Modern times as both a food and medicine.¹

Today, consumers turn to flax for its pleasant, nutty flavour and many health benefits. Clinical and large-scale population studies show that flax improves laxation, lowers blood cholesterol, aids in blood glucose control, and blocks inflammation.² Because it has an anti-inflammatory effect,^{3,4} eating flax regularly may help prevent and treat chronic diseases in which inflammation plays a role – chronic diseases like heart disease, stroke, diabetes, cancer, obesity, the metabolic syndrome, and Alzheimer disease. Here are good reasons to eat flax.

Major Nutritional Components of Flax

The major nutritional components of flax are oil (fat), protein, and dietary fibre, as shown in Table 1. Milled flax provides about 36 kcal/tbsp. Flax oil provides about 124 kcal/tbsp. Ground flax is very low in carbohydrates (sugars and starches), providing only 0.1 g/tbsp – one reason why flax is popular with people following a high-protein, low-carbohydrate weight-loss diet.²

TABLE 1
Composition of Flax As a Food

Fat ^a	41%
Total dietary fibre	28%
Protein	20%
Moisture	7%
Ash	4%

^aAnalysed by the American Oil Chemists' Society's (AOCS) Official Method Am 2-93, which is based on the Federation of Oils, Seeds and Fats Associations Ltd. (FOSFA) Official Method. The American Organization of Analytical Chemists (AOAC) Method 996.06 will produce a lower fat content.

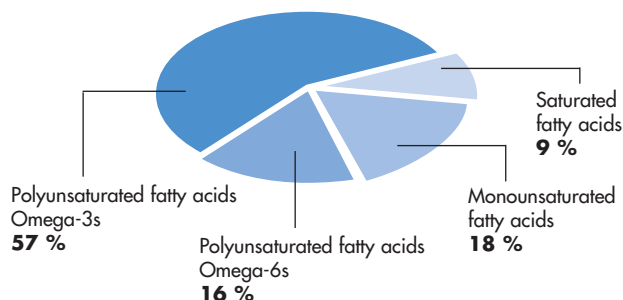
Additional information about the nutrient content of flax, including its vitamin and mineral content and amino acid profile, can be found in the Flax Council of Canada's book, *Flax – A Health and Nutrition Primer*. The book is available in PDF format on the Council's website at www.flaxcouncil.ca

A Unique Mix of Fatty Acids

Flax is naturally low in saturated fat and has a moderate amount of monounsaturated fat

(see Figure 1). Most of the fatty acids in flax are polyunsaturated. Flax is particularly rich in alpha-linolenic acid (ALA), the essential omega-3 fatty acid. As little as one tbsp of ground flax provides 1.8 g ALA, more than enough to meet the daily recommended intake for this nutrient.⁵

FIGURE 1
Fatty Acid Composition of Flax Oil



A Low Omega-6/Omega-3 Fatty Acid Ratio

Because of its high ALA content, flax has an omega-6/omega-3 fatty acid ratio of 0.3:1. Consuming flax, flax products, and omega-3 enriched eggs derived from hens fed flax or other similarly enhanced foods increases the omega-3 fatty acid content of the diet and improves the dietary omega-6/omega-3 fatty acid ratio. Consumers are advised to increase their omega-3 fat intake because the typical Western-type diet is high in omega-6 fats and low in omega-3 fats compared with the Paleolithic diet on which humans evolved.⁶ Eating less omega-6 fats and more omega-3 fats may help lower the risk of chronic diseases like heart disease, stroke, and cancer.

Essential Fatty Acids

Flax contains two essential fatty acids (EFAs) – alpha-linolenic acid (ALA), the parent fatty acid of the omega-3 family, and linoleic acid (LA), the parent fatty acid of the omega-6 family. EFAs are required for maintaining the structure of cell membranes and the health of the skin, and they are involved in cholesterol transport and metabolism. EFAs can be converted to compounds called eicosanoids, which play a role in inflammatory reactions.²

Lignans

Lignans are both antioxidants and phytoestrogens. Antioxidants are compounds that work to keep oxygen from reacting with and damaging proteins, fats and other compounds in our tissues. Phytoestrogens are



compounds found in plants that can have weak estrogen activity in animals and humans.

The main lignan in flax is secoisolariciresinol diglycoside (SDG). The SDG found in flax and other foods is converted by bacteria in the gut to the lignans found in humans and other mammals – enterodiol and enterolactone.

The level of enterodiol and enterolactone in blood and urine reflects the lignan content of the diet. In one study of nine healthy young women, for example, eating milled flax for seven days produced significant increases in the plasma and urinary concentrations of enterolactone and enterodiol.⁷

Lignans protect against cancer by blocking certain enzymes involved in hormone metabolism and interfering with the growth and spread (metastasis) of tumour cells.^{8,9} Indeed, populations with high intakes of lignans, antioxidants and phytoestrogens from fruits, vegetables, nuts and whole grains have low rates of cancer of the ovaries^{10,11} and the Gastrointestinal (GI) tract – including cancer of the mouth, esophagus, stomach, colon and rectum¹²⁻¹⁸ – compared with those who have low intakes of these foods.¹⁹

In addition to having anticancer effects, a new study suggests that postmenopausal women who have a high intake of lignans perform better on tests of memory than women with low intakes. The intake of lignans, but not isoflavones (found in soy products, beans, peas, nuts), was related to better cognitive function in this study.²⁰

Other Phytochemicals

Flax contains several phytochemicals. (“Phyto” means “plant.”) In addition to the lignans, which are abundant in flax, flax contains phenolic acids, cinnamic acids, flavonoids, and lignins. These compounds are antioxidants and affect cell growth and viability – actions that may increase their potential use as agents which protect against cancer and heart disease.^{21,22}

Dietary Fibre

Flax is a source of dietary fibre, providing about 2.2 g/tbsp of ground flax. It contains both insoluble and soluble fibre. Insoluble fibre helps improve laxation and prevent constipation, mainly by increasing fecal bulk and reducing bowel transit time.¹³ In a recent study of elderly residents in a long-term care facility, adding 1 tbsp of milled flax to the daily diet resulted in a 32% increase in bowel frequency by the end of the 4-month intervention. The use of suppositories decreased 50% in this population over the course of the study.²³

The water-soluble fibre fraction of flax makes up about one-third of total dietary fibre. The main soluble fibre in flax is mucilage gum. Water-soluble fibre helps maintain blood glucose levels and lower blood cholesterol levels.²

North Americans are advised to eat more fibre-rich foods,^{24,25} as diets rich in fibre appear to protect against

cancers of the GI tract and the lung. A protective effect of fibre-rich diets for cancers of the breast and prostate has not been established conclusively. Even so, diets rich in fibre from fruits, vegetables, and whole grains are less likely to promote obesity – itself a risk factor for cancer – because these foods tend to be low in fat.^{13,26}

It Tastes Good, Too!

Flax is rich in ALA, the essential omega-3 fat; lignans, which are phytoestrogens and antioxidants; and dietary fibre, which helps maintain bowel function. Just as important as its nutrient content is its taste – flax has a mild, nutty flavour. It can be mixed into salads, soups, stews, chilies, hamburgers, vinaigrettes, hot and cold cereals, fruit smoothies, cookies, muffins and bread dough. Indeed, it can be added to just about any recipe!

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