



# flax

*a healthy food*

Flax comes from a blue-flowered plant grown in the cool, northern climate of the western Canadian prairies. Canadian brown flax is the favourite choice of consumers. The omega-3 fatty acid and fibre in flax are nutrients that help keep us healthy and well.

## **A better diet with flax**

Canadian flax is a high quality food. Flax contains the omega-3 fatty acid, alpha-linolenic acid (ALA); fibre; and lignans (see Table, page 2). Health experts prescribe these nutrients and other compounds for better health.

**Omega-3 fatty acid.** About 42% of flax seed is oil, and more than 70% of that oil is polyunsaturated fat, a healthy fat. Flax also contains 57% of the essential omega-3 fatty acid, ALA.

**Extra fibre.** Flax seed contains soluble and insoluble fibre. Soluble fibre can lower blood cholesterol levels, while insoluble fibre moves the stool through the colon more quickly, helping bowel movements.

**Lignans.** Flax seed is also one of the richest plant sources of lignans, providing up to 800 times more lignans than most other foods in a vegetarian diet. Lignans are phytoestrogens – compounds that have been shown in laboratory studies of animals to help protect against certain kinds of cancer, particularly cancers of the breast and colon, by blocking tumour formation.





## Health benefits of flax

The omega-3 fatty acids have a balancing role in the diet. They correct imbalances in modern diets that lead to health problems. Nutritionists caution that the amount of omega-3 fatty acids eaten in North America no longer meets our bodies' needs. You can balance your consumption of fatty acids by adding flax to your diet. Current research shows eating flax seed provides health benefits.

**A lower risk for heart disease.** Nutritionists advise paying attention to the kinds of fats eaten. They suggest you eat less saturated fat and trans fats, and more polyunsaturated fat – which flax provides. Studies show a diet high in ALA reduces the risk of heart disease by lowering cholesterol and by preventing the buildup of harmful deposits in arteries. In other studies, where scientists studied large groups of people to find disease trends, increasing the ALA content of the diet corresponded to a decrease in risk of stroke and heart disease.

**Prevention of some forms of cancer.** The link between diet and cancer is well known. Flax contains dietary fibre and omega-3 fat in the form of ALA, which can help reduce the risk of cancer. Furthermore, studies showed the ALA in flax slowed inflammation which led to cell growth in cancer. Another study on women newly diagnosed with breast cancer showed a slowing of tumour growth with the addition of flax to their diet.

**Treatment of immune disorders.** The lignans and ALA in flax help prevent inflammation that affects the body's immune system. Flax in the diet may be useful in the treatment of such immune disorders as rheumatoid arthritis, psoriasis and lupus.

**Diabetes.** Studies show flax lowers blood glucose in healthy, young adults. The effect of flax in the diets of people with type 2 diabetes is currently being investigated.

**Relief from constipation.** Studies in older adults show eating flax helps increase the frequency of bowel movements.

### Composition of flax<sup>a</sup>

Form of flax	Weight g	Common measure	Energy kcal	Total fat g	ALA <sup>b</sup> g	Protein g	Total CHO <sup>c,d</sup> g	Total dietary fibre g
Proximate analysis	100	–	450	41.0	23.0	20.0	29.0	28.0
Whole seed	180	1 cup	810	74.0	41.0	36.0	52.0	50.0
	11	1 tbsp	50	4.5	2.5	2.2	3.0	3.0
	4	1 tsp	18	1.6	0.9	0.8	1.2	1.1
Milled seed	130	1 cup	585	53.0	30.0	26.0	38.0	36.0
	8	1 tbsp	36	3.3	1.8	1.6	2.3	2.2
	2.7	1 tsp	12	1.1	0.6	0.5	0.8	0.8
Flax oil	100	–	884	100.0	57.0	–	–	–
	14	1 tbsp	124	14.0	8.0	–	–	–
	5	1 tsp	44	5.0	2.8	–	–	–

<sup>a</sup>Based on a proximate analysis conducted by the Canadian Grain Commission. (6) The fat content was determined using the American Oil Chemists' Society (AOCS) Official Method Am 2-93. The moisture content was 7.7%.

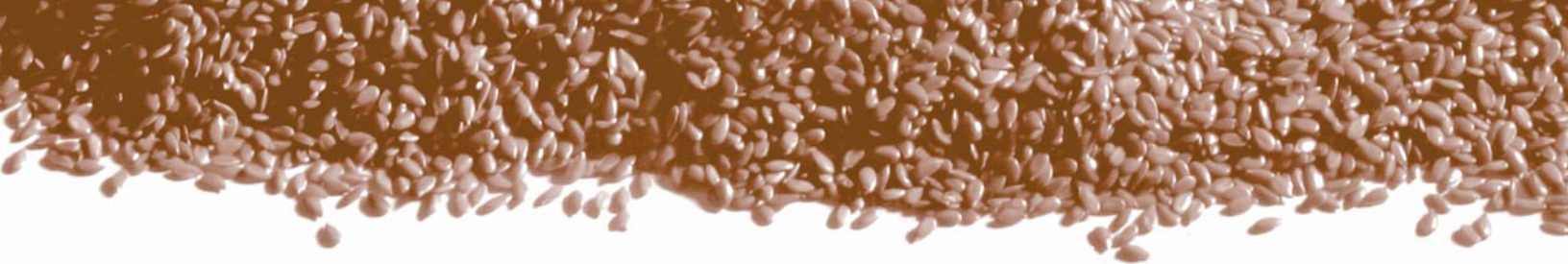
<sup>b</sup>ALA = Alpha-linolenic acid, the essential omega-3 fatty acid.

<sup>c</sup>CHO = Carbohydrate.

<sup>d</sup>Total Carbohydrate includes carbohydrates like sugars and starches (1g) and total dietary fibre (28 g) per 100 g flax seeds.

Source: Morris D.H. Flax: A health and nutrition primer. Winnipeg: Flax Council of Canada; 2003. p 11.





## Adding flax to your diet

Flax adds a pleasant, nutty taste to foods. You can buy flax by the scoop, vacuum pack, bottle or capsule, or find it in some favourite foods. Here are some ways to use flax.

*Scoop*

**Whole seeds**

Whole flax seeds add colour and crunch to foods. You can sprinkle flax seeds on top of home baking or mix them into a dough. However, to obtain maximum benefit from flax, you should first grind flax seeds because whole seeds will pass through your system undigested.

*Whirr*

**Milled flax**

Grinding whole seeds breaks their tough outer skin, creating a light-coloured powder. Milled flax is sold in a vacuum package, or you can prepare it yourself in a coffee grinder. Sprinkle milled flax on cereal, or add it to doughs, batters, casseroles and other cooked foods.

*Pour*

**Flax oil**

Flax oil is sold in bottles. The oil is extracted from whole flax seeds, using a cold-press process especially developed for plant oils. Pour flax oil on fresh salads. Flax oil provides ALA, but no fibre or lignans.

*Pop*

**Gel capsule**

Flax oil is sealed in gel capsules and sold for you to take as a dietary supplement, following manufacturers' dosage.

*Crack*

**Omega-3 enriched eggs**

Omega-3 enriched eggs contain extra omega-3 fatty acids from flax fed to hens. You can use omega-3 eggs wherever you would use regular eggs – there's no taste difference, only nutrition enrichment. If eaten on a regular basis, omega-3-enriched eggs make a substantial contribution to your need for omega-3 fatty acids. The caloric value and protein content of omega-3 enriched eggs are similar to that of regular eggs.

*Try*

**Omega-3 enriched foods**

Omega-3 enriched foods, such as yogourt and milk, may contain flax oil, while flax baked goods, such as breads, can include milled or whole flax.





## How much flax to eat

Like any fibrous food, flax can upset your digestion if you add too much, too quickly. In a balanced diet, eating 5 g (1 tsp) of flax oil or 8 g (1 Tbsp) of milled flax daily provides enough ALA to meet dietary needs.

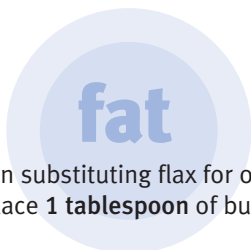
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## Storing flax

Whole flax seed	You can store whole flax seed, which is clean, dry and of good quality, at room temperature for up to a year.
Milled flax seed	To keep flax fresh, you should grind it as you need it. You can keep milled flax refrigerated in an airtight, opaque container for up to 30 days.

## Flax substitutions for special diets

Flax can replace **fat** or **eggs** in a recipe.



**Fat Substitution Instructions:** Use a 3:1 ratio when substituting flax for oil in a recipe. For example, **3 tablespoons** of milled flax can replace **1 tablespoon** of butter, margarine, shortening or vegetable oil.



**Egg Substitution Instructions:** For every egg being replaced, mix 1 tablespoon milled flax with 3 tablespoons water in a small bowl and let sit for one or two minutes. The mixture will become gel-like. Add to your recipe as you would an egg.

**1 tablespoon milled flax + 3 tablespoons water = 1 egg**



## Flax recipe

Maximize your flax intake with a snack that nourishes!

### BANANA BLUEBERRY LOAF

325 mL	All-purpose sifted flour	1 1/3 cup
150 mL	Milled flax*	2/3 cup
12 mL	Baking powder	2 1/2 tsp
2 mL	Salt	1/2 tsp
75 mL	White sugar	1/3 cup
1	Egg	1
250 mL	Banana, mashed	1 cup
175 mL	Skim milk	3/4 cup
5 mL	Lemon zest	1 tsp
175 mL	Frozen unsweetened wild blueberries	3/4 cup
75 mL	Pecans (optional)	1/3 cup

\* Mill flax seeds in a coffee grinder to make a light, granular powder

#### Method

- Preheat oven to 180°C (350°F).
- In medium-sized bowl, mix flour, milled flax, baking powder and salt; set aside.
- In a separate bowl, beat together sugar and egg until sugar is dissolved.
- Add to this mix, mashed banana, skim milk, and lemon zest. Mix well.
- Add in dry ingredients, and fold until moistened.
- Fold in blueberries and pecans.
- Turn batter into a lightly greased 11.5 cm x 21.5 cm ( 4 1/2" x 8 1/2" ) loaf pan.
- With a spatula or the back of a spoon, level batter in pan.
- Bake for 60 minutes, or until an inserted toothpick comes out clean.
- Cool on a wire rack for 5 minutes. Remove loaf from pan and cool to room temperature.

Yield: 1 loaf: 14 slices (1.27 cm (1/2") thick.

Serving size: 1 slice

Flax Content: 8.5% flax or 5.7g per serving

#### Single Serving Nutrient Values

Calories	153.2
Fat	4.9g
Saturated	0.5g
Monounsaturated	1.99g
Polyunsaturated	2.1g
Omega-3	1.0g
Cholesterol	13.6mg
Carbohydrates	24.6g
Fibre	2.9g
Folate	59.0 DFE*
Protein	4.0g

\*Folate intake is measured in micrograms (µg) of dietary folate equivalents (DFE).

