

NEW FLAX FACTS

OMEGA-3 FATS IN FLAX AND FISH ARE SIMILAR IN MANY WAYS

by Dr. Diane H. Morris

Introduction

Consumers want to know: Are the omega-3 fats in fish the same as those found in flax? The answer is that omega-3 fats are like siblings – they are alike in some ways and different in others.

What Are the Major Omega-3 Fats?

Alpha-linolenic acid (ALA) is the essential omega-3 fat. The word “essential” means that we must eat ALA in our diets because our bodies cannot make it. In other words, ALA is an essential nutrient just like vitamin C and calcium. The human body needs ALA to be healthy. Two other omega-3 fats are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). EPA and DHA are vital for health, but they are not strictly “essential” because our bodies make them from ALA. In one study, for instance, the blood level of EPA increased 60% when 56 African-American adults with chronic illness consumed 3 grams of ALA daily for 12 weeks. The source of ALA in this study was flax oil capsules.¹

Which Foods Are Rich in Omega-3 Fats?

Omega-3 fats are found in a variety of foods. Plants, fish, and omega-3-enriched eggs and dairy products are the main sources of these important fats.

ALA

ALA is found mainly in flax seeds and walnuts and in plant oils like flax, canola and soybean oils. Flax seeds and flax oil are the richest sources of ALA in the North American diet.² Flax-based omega-3-enriched eggs and dairy products enriched with flax oil, along with some fish like Atlantic salmon and canned sardine, are good sources of ALA. Small amounts of ALA can be found in cereals, breads, bagels, spaghetti, energy bars and cookies made with added flax. Beef, pork and chicken also contain small amounts of ALA.

EPA and DHA

EPA and DHA are found mainly in fatty fish like herring, salmon, mackerel and bluefin tuna and the fish oil supplements made from them. White fish like haddock, cod, flounder, sole and orange roughy, along with the fried fish fillets made from these white fish, contain small amounts of EPA and DHA.

Algae are rich sources of DHA, but contain little EPA. Plants do not contain EPA and DHA.

Nutrient Content Claims for Omega-3 Fats

Canada and the United States allow food processors

to identify foods that are good sources of omega-3 fats. In Canada, the nutrition label can state that a food like novel pork meat (derived from pigs fed a ration enriched with flax) is a “source of omega-3 fat”.^{3,4} In the United States, flax oil, flax seeds, and flax-based omega-3-enriched eggs and some dairy products qualify for a label claim as a “high” source of ALA omega-3 fat.⁵ (See Table 1 below.) White fish like haddock and cod do not qualify for a label claim because they are relatively low in omega-3 fat.

Table 1

Foods Qualifying for a Label Claim of “High” Source of Omega-3 Fats, Ranked by Omega-3 Fat Content^{a,b}

OMEGA-3 FAT CONTENT PER REFERENCE AMOUNT ^c		
ALA	EPA	DHA
Flax oil	Herring	Salmon, Atlantic, wild
Flax seeds	Salmon, coho, wild	Tuna, bluefin
Walnuts	Mackerel	Herring
Walnut oil	Salmon, Atlantic, wild	Salmon, coho, wild
Canola oil	wild	Striped bass
Soybean oil	Tuna, bluefin	Mackerel
Flax-based omega-3 enriched egg ^d	Sardine, canned in oil	Sea bass
Atlantic salmon capsules ^e	Menhaden oil	Shark
Sardine, canned in oil	capsules ^e	Sardine, canned in oil
	Shark	Menhaden oil
	Striped bass	capsules
	Sea bass	Omega-3 enriched egg ^f

^a Source: O’Flaherty MJ (5).

^b Omega-3 fat content ranked from highest to lowest within each column, based on grams of fatty acid per reference amount of food. Values are for cooked fish. Sources of data: flax, flax oil and omega-3 enriched eggs (2); all other foods – U.S. Department of Agriculture, Nutrient Database for Standard Reference, Release 18, available at www.ars.usda.gov/nutrientdata.

^c Reference amount = the amount customarily consumed. For fats and oils like flax oil, the reference amount is 1 tablespoon.

^d Flax-based omega-3 enriched eggs are derived from laying hens fed flax.

^e Values are for 2 capsules; data obtained from www.fishoilcapsules.com.

^f Omega-3 enriched eggs are derived from laying hens fed a variety of feed supplements.

Do All Omega-3 Fats Have the Same Health Benefits?

Just like siblings, omega-3 fats are alike in some ways and different in others. ALA, EPA and DHA are alike in keeping the body’s cell membranes flexible and elastic to help cells work properly, and they block the actions of some compounds that cause inflammation.⁶ Chronic diseases like heart disease, diabetes, cancer and arthritis are marked by inflammation. Omega-3 fats help reduce chronic disease risk by blocking inflammation.

In a clinical study involving adults with moderate high blood cholesterol, eating a diet rich in ALA from walnuts, walnut oil and flax oil reduced the blood level of one marker of inflammation by 75%.⁷ In the Nurses’ Health Study, the greater the ALA intake, the lower the concentration of the inflammatory markers in



the blood.⁸ These findings suggest that ALA helps reduce inflammation and thereby lowers chronic disease risk.

DHA is unique in its health effects. Because it helps the eye, brain and nervous system develop properly, infants have a special need for DHA. Aging adults may need DHA, too. A study of 815 elderly people living in Chicago found that those with the highest DHA intake had the most protection against Alzheimer Disease.⁹

Why Eat Flax?

Flax seeds are a rich source of ALA, lignans and dietary fibre. Lignans are phytoestrogens – plant compounds that can have estrogen-like actions in animals and humans. Through the actions of the lignans and ALA, flax blocks tumour growth in animals and may help reduce cancer risk in humans.²

Flax lowers blood cholesterol levels and helps reduce the risk of heart attacks and stroke, partly through the actions of ALA.¹⁰ ALA may be especially important to vegetarians and people with low intakes of fatty fish. Findings from the Health Professionals Follow-up Study of 45,722 men indicated that each one gram of ALA in the daily diet was associated with a 47% lower risk of heart disease among men with low intakes of EPA and DHA (< 100 mg per day).¹¹ Eating flax every day increases the daily ALA intake.

Flax dietary fibre promotes laxation and helps the bowel work properly. The pleasant, nutty taste of flax makes it an ideal addition to hot and cold cereals, fruit smoothies, cookies and other baked goods, meatloaf, pasta and soup.

Looking for flax lignans and dietary fibre?

Lignans are found in the fibre fraction of the flax seed. For this reason, flax oil does not naturally contain lignans, although some processors add purified lignans to the oil to enhance its nutritional value.

Flax seeds, but not flax oil, are a good source of dietary fibre. One tablespoon of whole flax seeds contains as much total dietary fibre as 1/2 cup of cooked oat bran. One tablespoon of milled flax contains as much total dietary fibre as 1 slice of whole wheat bread; 1/3 cup of cooked, chopped broccoli; 1/3 cup of cooked pearled barley; 1/2 cup of cooked, long-grain brown rice; or 1/4 cup of cooked oat bran.¹⁶

Why Eat Fish?

Fish is valued for its high-quality protein and nutrient content, including omega-3 fats. Populations with high fish intakes, like the Japanese and Inuit, have low rates of some chronic diseases like heart disease.¹²

Is it safe to eat fish? Federal health agencies in Canada¹³ and the United States¹⁴ conclude that the benefits of eating fish outweigh concerns about traces of mercury in fish. However, both countries advise pregnant and nursing women, women who may become pregnant and young children to avoid eating certain fish.

What about fish oil supplements? Fish oil capsules are the most concentrated form of omega-3 fats, but they may contain polychlorinated biphenyls (PCBs). PCBs are chemicals used in industrial processes and may cause cancer in humans. Consumers who follow the label recommendation on some fish oil supplements can take in up to 43% of the daily upper limit of PCBs. Consumers who take fish oil capsules and eat PCB-contaminated fish may increase their risk of PCB toxicity.¹⁵ Besides safety, the main factors to consider are price, convenience, dietary preference and tolerance of a fishy aftertaste experienced with some fish oil capsules.

Flax and Fish – Both Offer Good Nutrition

Flax is rich in ALA, the essential omega-3 fat, and contains dietary fibre and lignans. Fish contain high-quality protein and omega-3 fats. Fatty fish are rich in DHA. Both flax and fish contain important nutrients and belong in a healthy eating plan.

One key difference is sustainability. Flax is a sustainable crop. Fish may not be. Today's North American consumers can eat fish when they want to – a situation that may change in the coming years if the global demand for fish continues. The pressures on global fish stocks may eventually force the global community to ration the world's ocean fish. For the time being, consumers can enjoy both.

References

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