



The Nutrition Source

Omega-3 Fatty Acids: An Essential Contribution

The human body can make most of the types of fats it needs from other fats or raw materials. That isn't the case for omega-3 fatty acids (also called omega-3 fats and n-3 fats). These are *essential* fats—the body can't make them from scratch but must get them from food. Foods high in Omega-3 include fish, vegetable oils, nuts (especially walnuts), flax seeds, flaxseed oil, and leafy vegetables.

What makes omega-3 fats special? They are an integral part of cell membranes throughout the body and affect the function of the cell receptors in these membranes. They provide the starting point for making hormones that regulate blood clotting, contraction and relaxation of artery walls, and inflammation. They also bind to receptors in cells that regulate genetic function. Likely due to these effects, omega-3 fats have been shown to help prevent heart disease and stroke, may help control lupus, eczema, and rheumatoid arthritis, and may play protective roles in cancer and other conditions.

Omega-3 fats are a key family of polyunsaturated fats. There are three main omega-3s:

- Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) come mainly from fish, so they are sometimes called marine omega-3s.
- Alpha-linolenic acid (ALA), the most common omega-3 fatty acid in most Western diets, is found in vegetable oils and nuts (especially walnuts), flax seeds and flaxseed oil, leafy vegetables, and some animal fat, especially in grass-fed animals. The human body generally uses ALA for energy, and conversion into EPA and DHA is very limited.

The strongest evidence for a beneficial effect of omega-3 fats has to do with heart disease. These fats appear to help the heart beat at a steady clip and not veer into a dangerous or potentially fatal erratic rhythm. (1) Such arrhythmias cause most of the 500,000-plus cardiac deaths that occur each year in the United States. Omega-3 fats also lower blood pressure and heart rate, improve blood vessel function, and, at higher doses, lower triglycerides and may ease inflammation, which plays a role in the development of atherosclerosis. (1)

Several large trials have evaluated the effect of fish or fish oils on heart disease. In the Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardio (known as the GISSI Prevention Trial), heart attack survivors who took a 1-gram capsule of omega-3 fats every day for three years were less likely to have a repeat heart attack, stroke, or die of sudden death than those who took a placebo. (2) Notably, the risk of sudden cardiac death was reduced by about 50 percent. In the more recent Japan EPA Lipid Intervention Study (JELIS), participants who took EPA plus a cholesterol-lowering statin were less likely to have a major coronary event (sudden cardiac death, fatal or nonfatal heart attack, unstable angina, or a procedure to open or bypass a narrowed or blocked coronary artery) than those who took a statin alone. (3)

Most Americans take in far more of another essential fat—omega-6 fats—than they do omega-3 fats. Some experts have raised the hypothesis that this higher intake of omega-6 fats could pose problems, cardiovascular and otherwise, but this has not been supported by evidence in humans. (4) In the Health Professionals Follow-up Study, for example, the ratio of omega-6 to omega-3 fats wasn't linked with risk of heart disease because both of these were beneficial. (5) Many other studies and trials in humans also support cardiovascular benefits of omega-6 fats. Although there is no question that many Americans could benefit from increasing their intake of omega-3 fats, there is evidence that omega-6 fats also positively influence cardiovascular risk factors and reduce heart disease.



Researchers are taking a hard look at a different sort of balance, this one between possible effects of marine and plant omega-3 fats on prostate cancer. Results from the Health Professionals Follow-up Study and others show that men whose diets are rich in EPA and DHA (mainly from fish and seafood) are less likely to develop advanced prostate cancer than those with low intake

of EPA and DHA. (6) At the same time, some-but not all-studies show an increase in prostate cancer and advanced prostate cancer among men with high intakes of ALA (mainly from supplements). However, this effect is inconsistent. In the very large Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial, for example, there was no link between ALA intake and early, late, or advanced prostate cancer. (7)

Recipes for health



Here’s a delicious way to get your omega-3s: Try [Pan Roasted Salmon with Minty Snap Peas](#).

Given the wide-ranging importance and benefits of marine omega-3 fatty acids, it is important to eat fish or other seafood one to two times per week, particularly fatty (dark meat) fish that are richer in EPA and DHA. This is especially important for women who are pregnant or hoping to become pregnant and nursing mothers. From the third trimester until the second year of life, a developing child needs a steady supply of DHA to form the brain and other parts of the nervous system. Many women shy away from eating fish because of concerns that mercury and other possible contaminants might harm their babies, (9) yet the evidence for harm from lack of omega-3 fats is far more consistent, and a balance of benefit vs. risk is easily obtained. (To learn more about the controversy over contaminants in fatty fish, read [Fish: Friend or Foe](#).)

This table lists common fish and seafood products and their omega-3 fatty acid content.

Type of Seafood	Serving Size	Omega-3 Fatty Acids
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		(mg/serving)
Anchovy	2.0 oz	1,200
Catfish (farmed)	5.0 oz	253
Clams	3.0 oz	241
Cod (Atlantic)	6.3 oz	284
Crab	3.0 oz	351
Fish sticks (frozen)	3.2 oz	193
Halibut	5.6 oz	740
Lobster	3.0 oz	71
Mahi mahi	5.6 oz	221
Mussels	3.0 oz	665
Oysters	3.0 oz	585
Pollock (Alaskan)	2.1 oz	281
Salmon (wild)	6.0 oz	1,774
Salmon (farmed)	6.0 oz	4,504
Sardines	2.0 oz	556
Scallops	3.0 oz	310
Shrimp	3.0 oz	267
Swordfish*	3.7 oz	868
Trout	2.2 oz	581
Tuna (albacore)**	3.0 oz	733
Tuna (light, skipjack)	3.0 oz	228

SOURCE: Mozaffarian D, Rimm EB. [JAMA](#). 2006;296:1885-1899.

*Swordfish contains high levels of mercury, as does shark, king mackerel, and tilefish (sometimes called golden bass or golden snapper). Women who are or may become pregnant, nursing mothers, and young children should avoid these high-mercury species of fish, but can eat up to 12 ounces (two average meals) a week of a variety of fish and shellfish that are lower in mercury.

**Albacore tuna contains more mercury than canned, light tuna. Women who are or may become pregnant, nursing mothers, and young children should limit albacore tuna to one serving per week.

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