

Omega-3 and Omega-6 Fatty Acids

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Omega-3 and Omega-6 fatty acids, found in foods, are important to health. Learn how much you need and which foods are the best sources.

Fats in our food are categorized according to the predominant fatty acid present. Typically fats are categorized as saturated fatty acids or unsaturated fatty acids. Some examples of foods high in saturated fats are butter and lard. These fats are solid at room temperature. Fats high in unsaturated fatty acids are liquid at room temperature. Examples are vegetable oils such as canola, corn, olive, or soybean. Unsaturated fatty acids may be monounsaturated or polyunsaturated.

The two polyunsaturated fatty acids essential for health are omega-3 and omega-6. These are essential because they cannot be manufactured by the body and must come from food. Omega-3 fatty acids are needed for brain and eye development of the growing fetus during pregnancy and for maintaining and promoting health throughout life. Omega-6 fatty acids play an important role in brain and heart function, and in normal growth and development. The following table shows common forms, food sources, reference intakes, and a summary of research findings related to potential health benefits associated with consuming omega-3 and omega-6 fatty acids.

Table I. Common forms, food sources, recommended intakes, and research findings related to Omega-3 and Omega-6 fatty acids.

	<i>Omega-3 Fatty Acids</i>	<i>Omega-6 Fatty Acids</i>
Most Common Forms	Eicosapentaenoic (EPA), Docosahexaenoic (DHA), and Alpha-linolenic (ALA) acids	Linoleic acid (LA) accounts for 85 percent to 90 percent of dietary omega-6 fatty acids
Common Food Sources	EPA and DHA — fatty fish such as salmon, white tuna, mackerel, rainbow trout, herring, halibut, and sardines ALA — canola or soybean oil, walnuts, and ground flaxseed or flaxseed oil	Vegetable oils (e.g. corn, sunflower, safflower, and soy), salad dressing, nuts, whole wheat bread and chicken
2005 Dietary Reference Intake (DRI) Identified as Adequate Intake (AI)	ALA Recommendations 1.6 grams per day for men 19 years or older 1.1 grams per day for women 19 years or older	LA Recommendations 17 grams per day for men between 19 and 50 years old 14 grams per day if over 50 for men 12 grams per day for women between 19 and 50 years old 11 grams per day if over 50 for women
Research Suggests Potential Health-Promoting Benefits	<ul style="list-style-type: none"> • Reduce inflammation in heart disease, inflammatory bowel disease, and rheumatoid arthritis • Help prevent blood from clotting and sticking to artery walls • Help lower risk for blocked blood vessels and heart attacks • Prevent hardening of the arteries • Decrease risk of sudden death and abnormal heart rates • Decrease triglyceride levels • Lower blood pressure 	<ul style="list-style-type: none"> • Neutral or lower levels of inflammatory markers • Replacing saturated and trans fat with omega-6 fatty acids associated with decreasing risk of heart disease • Improve insulin resistance and reduce the incidence of diabetes • Lower blood pressure • Lower cholesterol levels

Omega-3 Fatty Acids

The American Heart Association (AHA) has recommended that healthy adults eat at least two servings of fish (such as salmon, white tuna, mackerel, rainbow trout, herring, halibut, and sardines) per week to boost omega-3 fatty acid intake. Eating 2 to 4 ounces will generally provide about 1 gram of omega-3 fatty acids. Another food source is the Omega Egg, a University of Nebraska patented product that is high in omega-3 fatty acids. Eggs are produced from hens that eat a patented diet including flaxseed. These eggs look and taste like conventional eggs but have nearly six times the omega-3 fatty acids, a third less saturated fat and less cholesterol than conventional eggs. Other enriched food sources include milk, cheese, yogurt, spreads, and grain products and are labeled as containing omega-3 fatty acids.

Supplements

Research has demonstrated that omega-3 fatty acid supplements have some positive effects on triglycerides and HDL levels, but food is still the best source since a variety of other nutrients are provided. Fish oil supplements will not undo the effects of an otherwise high fat diet and inactive lifestyle. When taking a supplement it is best to consult a registered dietitian or physician. The Food and Drug Administration has also noted that high intakes of EPA and DHA can cause excessive bleeding in some people.

AHA Recommendations Based on Health Status

- **No documented coronary heart disease (CHD)** — Eat a variety of (preferably fatty) fish at least twice a week. Include oils and foods rich in ALA (flaxseed, canola, and soybean oils; flaxseed and walnuts).
- **Documented CHD** — Consume about 1 gram of EPA+DHA per day, preferably from fatty fish. EPA+DHA supplements could be considered in consultation with the physician.
- **Need to lower triglycerides** — Consume 2 to 4 grams of EPA+DHA per day provided as capsules under a physician's care.

Source: American Heart Association, 2006 <http://www.americanheart.org>.

Cautions on Fish

Some fish may contain environmental contaminants such as methylmercury or polychlorinated biphenols that may cause a health risk. Such substances generally are highest in older, larger, and more predatory fish or marine mammals. Therefore, the Food and Drug Administration and the Environmental Protection Agency have provided guidelines to help individuals determine their best course of action.

- Young children, women who may become pregnant, and pregnant or nursing women are at highest risk for exposure.
- Shark, swordfish, king mackerel, and tilefish have the highest mercury levels and should be avoided by

women and young children. Also limit albacore tuna to one serving per week.

- For other fish and shellfish with lower mercury levels, women and young children may eat up to two regular servings per week (no more than 6 to 12 ounces per week).
- Check with local advisories about fish caught from local lakes, rivers, and coastal areas.
- For other individuals, the consumption of a variety of fish prepared with little or no added fat far outweighs the potential risks from environmental contaminants.

The following Web sites have more specific guidance about fish consumption: <http://www.epa.gov/waterscience/fish/>, <http://www.cfsan.fda.gov/~frf/sea-mehg.html>

Omega-6 Fatty Acids

The AHA recommends that people get at least 5 percent to 10 percent of calories from omega-6 fatty acids in combination with other AHA lifestyle and dietary recommendations. The AI listed in *Table 1* represents 5 percent to 6 percent of calories from omega-6 fatty acids. Most Americans obtain enough of these oils from the foods they already consume, such as nuts, cooking oils, and salad dressings. According to National Health and Nutrition Examination Survey 2001-2002 data, the average U.S. intake of LA for adults 19 and older was about 6.7 percent of energy or 14.8 grams per day based on a 2,000 calorie diet.

A few strategies to increase omega-6 fatty acids in the diet are to decrease the amount of saturated fat being consumed from food by making simple food substitutions, such as replacing 2 percent milk with fat-free milk, replacing full fat cheese with fat-free cheese, and using soft margarine as opposed to butter for breads and rolls. Another strategy is to try substituting butter or cream cheese with a high polyunsaturated fatty acid margarine, using sunflower seeds instead of croutons on a salad, or using a salad dressing containing high levels of polyunsaturated oils.

There has recently been some controversy over whether consuming omega-6 fatty acids are associated with increased risk of CHD and cardiovascular disease. However, research has demonstrated that consuming at least 5 to 10 percent of energy from omega-6 fatty acids may decrease the risk of CHD compared to lower intakes. The DRI Report and the 2005 Dietary Guidelines for Americans support the 5 to 10 percent of dietary energy from omega-6 fatty acids as an acceptable macronutrient distribution range (*range associated with reduced risk of chronic disease while providing adequate intakes of essential nutrients*). However, it is important to avoid eating too much of any one type of fat, even healthier fats, or other sources of calories, because of the potential for weight gain.

Ratio of Omega-3 to Omega-6 Fatty Acids

According to the AHA, it is more important to emphasize overall healthy eating patterns as opposed to focusing on

specific nutrient intakes. When recommendations are made regarding omega-6 to omega-3 consumption ratios, they are generally related to reducing omega-6 fatty acid intakes. Increasing omega-3 fatty acids in the diet has been associated with lower CHD risk, but there is a lack of evidence that lowering dietary omega-6 fatty acids would provide similar results. According to the evidence provided, it is better to consume the recommended levels of each form of polyunsaturated fatty acid in the diet rather than focus on ratios.

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Resources

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