

## OMEGA-3 FATTY ACIDS

Also known As: Essential fatty acids (EFAs), polyunsaturated fatty acids (PUFAs)

### Overview

Omega-3 fatty acids are considered *essential fatty acids*, which means that they are essential to human health but cannot be manufactured by the body. For this reason, omega-3 fatty acids must be obtained from food. Omega-3 fatty acids can be found in fish and certain plant oils. It is important to maintain an appropriate balance of omega-3 and omega-6 (another essential fatty acid) in the diet as these two substances work together to promote health. Also known as polyunsaturated fatty acids (PUFAs), omega-3 and omega-6 fatty acids play a crucial role in brain function as well as normal growth and development.

There are three major types of omega 3 fatty acids that are ingested in foods and used by the body: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). Once eaten, the body converts ALA to EPA and DHA, the two types of omega-3 fatty acids more readily used by the body. Extensive research indicates that omega-3 fatty acids reduce inflammation and help prevent certain chronic diseases such as heart disease and arthritis. These essential fatty acids are highly concentrated in the brain and appear to be particularly important for cognitive and behavioral function. In fact, infants who do not get enough omega-3 fatty acids from their mothers during pregnancy are at risk for developing vision and nerve problems.

It is very important to maintain a balance between omega-3 and omega-6 fatty acids in the diet. Omega-3 fatty acids help reduce inflammation and most omega-6 fatty acids tend to promote inflammation. An

### GOOD FATS, BAD FATS

**Monounsaturated Fats [GOOD]** come from plant sources. They are usually liquid at room temperature (canola and olive oil). Overall, these fats tend to lower total cholesterol and LDL in the blood. They help to maintain or slightly raise HDL.

**Polyunsaturated Fats [GOOD]** are also from plant sources. They are usually liquid at room temperature (safflower, sunflower, soybean oil). Their overall effect is to lower total cholesterol and LDL in the blood. They may also slightly lower HDL.

**Dietary Cholesterol [BAD]** is present in **ALL** foods of animal origin such as meat, fish, poultry, egg yolks and high fat dairy products. There is no cholesterol in vegetables, fruits, nuts or grains. Dietary cholesterol has less effect on raising and lowering blood cholesterol than the saturated fat does.

**Saturated Fats [VERY BAD]** are found in foods of animal origin (meat, fish, poultry and high fat dairy products). They are also present in palm oil, palm kernel oil, coconut oil, cocoa butter, and hydrogenated vegetable oils. They are usually solid at room temperature. Saturated fats raise total blood cholesterol, particularly LDL.

#### **BEWARE OF TRANS FAT!**

Trans Fat (Trans-fatty acid) is processed fat formed by partially hydrogenated edible oil. It is used commercially to prolong the shelf life of foods. Trans fat has clearly been linked to increased risk of heart attack and stroke. No amount of trans fat is safe. Unfortunately, it is found in forty percent of all supermarket food! If the food label lists partially hydrogenated oil as one of the first four ingredients, don't buy it. Note the amount of total fat listed and compare it with the breakdown of specific fats on the label. If there's a big difference, this probably represents trans fat.

inappropriate balance of these essential fatty acids contributes to the development of disease while a proper balance helps maintain and even improve health. A healthy diet should consist of roughly one to four times more omega-6 fatty acids than omega-3 fatty acids. The typical American diet contains **11 to 30 times more omega-6 fatty acids than omega-3 fatty acids** and many researchers believe this imbalance is a significant factor in the rising rate of inflammatory disorders in the United States.

In contrast, however, the Mediterranean diet consists of a healthier balance between omega-3 and omega-6 fatty acids and many studies have shown that people who follow this diet are less likely to develop heart disease. The Mediterranean diet does not include much meat (which is high in omega-6 fatty acids) and emphasizes foods rich in omega-3 fatty acids including whole grains, fresh fruits and vegetables, fish, olive oil, garlic, as well as moderate wine consumption.

### Some Foods With The Highest Amounts Of Omega-3 Fatty Acids

SALMON	SARDINES	TUNA
COD	MACKEREL	SWORDFISH
CRAB	SCALLOPS	SOYBEANS
WALNUTS	FLAX SEEDS	FLAX SEED MEAL

### Uses

Studies suggest that omega-3 fatty acids may be helpful in treating a variety of conditions. The evidence is strongest for heart disease and problems that contribute to heart disease, but the range of possible uses for omega-3 fatty acids include:

**High Cholesterol** - Especially high triglycerides and low HDL cholesterol

### High Blood Pressure

**Heart Disease** - One of the best ways to help prevent and treat heart disease is to eat a low-fat diet and to replace foods rich in saturated and trans-fat with those that are rich in monounsaturated and polyunsaturated fats (including omega-3 fatty acids). Evidence suggests that EPA and DHA found in fish oil help reduce risk factors for heart disease including high cholesterol and high blood pressure. There is also strong evidence that these substances can help prevent and treat atherosclerosis by inhibiting the development of plaque and blood clots, each of which tends to clog arteries. Studies of heart attack survivors have found that daily omega-3 fatty acid supplements dramatically reduce the risk of death, subsequent heart attacks, and stroke.

In fact, omega-3-fatty acids appear to work better than commonly prescribed cholesterol lowering drugs such as Lipitor and Zocor. A study in the April, 2005 Archives of Internal Medicine compared regular intake of omega-3-fatty acids with a commonly used statin drug. They found that the omega-3-fatty acids lowered heart attack and death rates significantly better than cholesterol lowering drugs.

**Stroke** - Eating at least two servings of fish per week can reduce the risk of stroke by as much as 50%.

**Arthritis** - Several articles reviewing the research in this area conclude that omega-3 fatty acid supplements reduce tenderness in joints, decrease morning stiffness, and allow for a reduction in the amount of medication needed for people with arthritis.

**Diabetes** - People with diabetes tend to have high triglyceride and low HDL levels. Omega-3 fatty acids from fish oil can help lower triglycerides and raise HDL, so people with diabetes may benefit from eating foods or taking supplements that contain DHA and EPA. ALA (from flaxseed, for example) may not have the same benefit as DHA and EPA because some people with diabetes lack the ability to efficiently convert ALA to a form of omega-3 fatty acids that the body can use readily.

**Osteoporosis** - Omega-3 fatty acids such as EPA help increase levels of calcium in the body, deposit calcium in the bones, and improve bone strength. In addition, studies also suggest that people who are deficient in certain essential fatty acids (particularly EPA and gamma-linolenic acid [GLA], an omega-6 fatty acid) are more likely to suffer from bone loss than those with normal levels of these fatty acids. In a study of women over 65 with osteoporosis, those given EPA and GLA supplements experienced significantly less bone loss over three years than those who were given a placebo. Many of these women also experienced an increase in bone density.

**Depression** - People who do not get enough omega-3 fatty acids or do not maintain a healthy balance of omega-3 to omega-6 fatty acids in their diet may be at an increased risk for depression. The omega-3 fatty acids are important components of nerve cell membranes. They help nerve cells communicate with each other, which is an essential step in maintaining good mental health.

**Attention Deficit/Hyperactivity Disorder (ADHD)** - Children with ADHD may have low levels of certain essential fatty acids (including EPA and DHA) in their bodies. In a study of nearly 100 boys, those with lower levels of omega-3 fatty acids demonstrated more learning and behavioral problems (such as temper tantrums and sleep disturbances) than boys with normal omega-3 fatty acid levels. In animal studies, low levels of omega-3 fatty acids have been shown to lower the concentration of certain brain chemicals (such as dopamine and serotonin) related to attention and motivation..

**Asthma** - Preliminary research suggests that omega-3 fatty acid supplements may decrease inflammation and improve lung function in adults with asthma. Omega-6 fatty acids have the opposite effect: they tend to increase inflammation and worsen respiratory function.

**Macular Degeneration** - A study comparing 350 people with macular degeneration to 500 without the disease found that those with a healthy dietary balance of omega-3 and omega-6 fatty acids and higher intake of fish in their diets were less likely to have this eye disorder.

**Colon Cancer** - Consuming significant amounts of foods rich in omega-3 fatty acids appears to reduce the risk of colorectal cancer. Animal and laboratory studies have found that omega-3 fatty acids prevent worsening of colon cancer while omega-6 fatty acids promote the growth of colon tumors.

**Breast Cancer** - Women who regularly consume foods rich in omega-3 fatty acids over many years may be less likely to develop breast cancer. In addition, the risk of dying from breast cancer may be significantly less for those who eat large quantities of omega-3 from fish. This is particularly true among women who substitute fish for meat. The balance between omega-3 and omega-6 fatty acids appears to play an important role in the development and growth of breast cancer.

**Prostate Cancer** - Laboratory and animal studies indicate that omega-3 fatty acids (specifically, DHA and EPA) may inhibit the growth of prostate cancer. Similarly, population based studies of groups of men suggest that a low-fat diet with the addition of omega-3 fatty acids from fish or fish oil help prevent the development of prostate cancer.

**Pregnancy** - Because developing fetuses cannot make their own omega-3 fatty acids, their needs must be met by their mothers. DHA and other essential nutrients are obtained by the mother through her diet or supplementation and are passed along to the fetus during pregnancy. Although the developing fetus requires DHA throughout the pregnancy, this vital nutrient is particularly important during the third trimester. These last three months are when much of the fetus' neurological, visual and nervous system development occurs.

The American Journal of Clinical Nutrition tells us a little more about DHA. University of Connecticut researchers looked at women and their newborn babies. The scientists found an association between high DHA levels in mom and a more mature, advanced sleeping cycle in their newborn baby. Researchers even suggest this early more mature sleeping pattern may predict higher brain function later in life.

### **Other**

Although further research is needed, preliminary evidence suggests that omega-3 fatty acids may also prove helpful in protecting against certain infections and treating a variety of conditions including ulcers, migraine headaches, pre-term labor, emphysema, psoriasis, glaucoma, Lyme disease, lupus, and panic attacks.

### **Precautions**

Because of the potential for side effects and interactions with medications, dietary supplements should be taken only under the supervision of a knowledgeable healthcare provider. Omega-3 fatty acids should be used cautiously by people who bruise easily, have a bleeding disorder, or take blood-thinning medications because excessive amounts of omega-3 fatty acids may lead to bleeding. Fish oil can cause flatulence and diarrhea and a fishy after taste. These side-effects can be minimized by placing the fish oil in the freezer or refrigerator.

### Sources Of Fish Oil

A variety of fish oil products are available in drug stores and vitamin outlets. Many of them are contaminated with heavy metals such as lead, mercury and arsenic and may have a significant variability in the concentration of the omega-3 fatty acids. Despite the total “fish oil milligrams” listed on the label, there can be significant differences in the actual amount of EPA/DHA in various brands. You should consult you primary care provider for the appropriate brands and doses that fit your needs.

### A Few Reliable Sources Of Fish Oil

Rating	Product
★★★★★	Metagenics – EPA-DHA products can be ordered at <a href="http://www.drpez.com">www.drpez.com</a>
★★★★★	Sears Labs OmegaRx ( <a href="http://searslabs.com">searslabs.com</a> )
★★★	Walgreens Complete Nutritionals
★★★	Kirkland Signature (COSTCO)
★★★	Solgar Omega-3 ( <a href="http://solgar.com">solgar.com</a> )
★★★	Vitamin World EPA Natural Fish Oil
★★★	IcelandHEALTH Omega-3 ( <a href="http://icelandhealth.com">icelandhealth.com</a> )

### To Order from Drpez.Com:

Go to [www.drpez.com](http://www.drpez.com) and click on **Patient Gateway** in the upper right-hand corner. Then click on **Register Now** in the upper left-hand corner and follow the prompts. This will allow you access to the Metagenics product gateway.

Metagenics provides the highest quality supplements available today. Their fish oil is molecularly distilled to assure purity and predicted safety. Metagenics sells their products only through health care professionals familiar with their appropriate use.

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### Supporting Research

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### The EFA Family

Physiologically speaking, there are two fatty acids that are truly "essential". These are Linoleic Acid (LA) and Alpha Linolenic Acid (ALA). The body cannot manufacture these fats itself, yet they are essential for health. A healthy body uses LA and ALA to produce other fatty acids, which, in turn, produce a host of beneficial compounds called eicosanoids. The derivative fatty acids each play specific roles in the maintenance of good health and we generally include them when we talk about "essential fatty acids". The derivative fatty acids include: Gamma Linolenic Acid, Eicosapentaenoic Acid (EPA), and Docosahexaenoic Acid (DHA). There is one other derivative of Linoleic Acid that isn't always a good fat, but it, too, is necessary in small amounts: Arachidonic Acid.

### Essential Fatty Acids and their functions in the body

#### Linoleic Acid (LA)

- \* found in processed foods, margarine, and vegetable oils
- \* helps improve skin conditions
- \* may be partially converted to GLA in the body
- \* typical North American diet includes an excess of LA, so we do not need to worry about supplementation with this fatty acid

#### Alpha Linolenic Acid (ALA)

- \* found primarily in flax oil and is also found in black currant oil
- \* positive effects have been documented in areas including: high blood cholesterol, high blood pressure, immune system function, male infertility and cancer
- \* the body converts a portion of ALA into two derivative fatty acids, EPA and DHA

#### Gamma Linolenic Acid (GLA)

- \* a healthy body may derive some GLA from LA
- \* the richest natural source of GLA is borage (also known as starflower) oil; GLA is also found in black currant and evening primrose oils
- \* the body uses GLA to produce eicosanoids that are highly anti-inflammatory, dilate blood vessels, and reduce blood clotting
- \* GLA is popularly used by women suffering from PMS
- \* GLA has been clinically indicated to have therapeutic benefits in many other health conditions including: rheumatoid arthritis, cardiovascular disease, diabetic neuropathy, cancer, and skin diseases such as eczema and psoriasis
- \* the body definitely needs GLA and most North Americans are likely not getting enough of it

#### Eicosapentaenoic Acid and Docosahexaenoic Acid (EPA and DHA)

- \* found in fish such as salmon, mackerel, tuna, and sardines
- \* EPA produces eicosanoids that have many beneficial effects in the body
- \* research demonstrates that EPA and DHA have therapeutic benefits in areas including: rheumatoid arthritis, high blood triglycerides, high blood pressure, cardiac arrhythmia (irregular heart beat), infant brain development, and cancer.

Arachidonic Acid (AA)

- \* necessary for infant brain development and small amounts are required for overall fetal development
- \* not generally deemed a "good" fat, because, in excess, AA may have some harmful effects
- \* AA is produced in the body from LA; also found in meat, eggs, and some shellfish
- \* the body uses AA to produce a class of eicosanoids that are strongly pro-inflammatory, constrict blood vessels, and increase the possibility of blood clotting. These compounds are useful when you accidentally cut your skin while peeling potatoes - without them you would bleed to death. But once you have an excessive amount of these eicosanoids, the blood can clot in places you don't really want it to - for example, arteries