

# Fish Oils: The Essential Nutrients

By

**Hans R. Larsen, MSc ChE**

There are good fats and there are bad fats. Artificially produced *trans*-fatty acids are bad in any amount and saturated fats from animal products should be kept to a minimum. The best fats or oils rather, since they are liquid at room temperature, are those that contain the **essential fatty acids** so named because without them we die. Essential fatty acids are polyunsaturated and grouped into two families, the omega-6 EFAs and the omega-3 EFAs.

Seemingly minor differences in their molecular structure make the two EFA families act very differently in the body. While the metabolic products of omega-6 acids promote inflammation, blood clotting, and tumor growth, the omega-3 acids act entirely opposite. Although we do need both omega-3s and omega-6s it is becoming increasingly clear that an excess of omega-6 fatty acids can have dire consequences. Many scientists believe that a major reason for the high incidence of heart disease, hypertension, diabetes, obesity, premature aging, and some forms of cancer is the profound imbalance between our intake of omega-6 and omega-3 fatty acids. Our ancestors evolved on a diet with a ratio of omega-6 to omega-3 of about 1:1. A massive change in dietary habits over the last few centuries has changed this ratio to something closer to 20:1 and this spells trouble. [1-3]

## Sources and requirements

The main sources of omega-6 fatty acids are vegetable oils such as corn oil and soy oil which contain a high proportion of linoleic acid. Omega-3 acids are found in flaxseed oil, walnut oil, and marine plankton and fatty fish. The main component of flaxseed and walnut oils is alpha-linolenic acid while the predominant fatty acids found in fatty fish and fish oils are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The most

beneficial and active of these fatty acids are EPA and DHA. Alpha-linolenic acid can be converted to EPA and DHA in the body, but the conversion is quite inefficient especially in older people. [1, 2]

Scientists were first alerted to the many benefits of EPA and DHA in the early 1970s when Danish physicians observed that Greenland Eskimos had an exceptionally low incidence of heart disease and arthritis despite the fact that they consumed a high-fat diet. Intensive research soon discovered that two of the fats (oils) they consumed in large quantities, EPA and DHA, were actually highly beneficial. More recent research has established that fish oils (EPA and DHA) play a crucial role in the prevention of atherosclerosis, heart attack, depression, and cancer. Clinical trials have shown that fish oil supplementation is effective in the treatment of many disorders including rheumatoid arthritis, diabetes, ulcerative colitis, and Raynaud's disease. [1-5]

Recognizing the unique benefits of EPA and DHA and the serious consequences of a deficiency the US National Institutes of Health recently published Recommended Daily Intakes of fatty acids. They recommend a total daily intake of 650 mg of EPA and DHA, 2.22 g/day of alpha-linolenic acid and 4.44 g/day of linoleic acid. Saturated fat intake should not exceed 8 per cent of total calorie intake or about 18 g/day.

## Good for the brain and children too.

The human brain is one of the largest "consumers" of DHA. A normal adult human brain contains more than 20 grams of DHA. Low DHA levels have been linked to low brain serotonin levels which again are connected to an increased tendency to depression, suicide, and violence. A high intake of fish has been linked to a significant decrease in age-related memory loss and cognitive function impairment and a lower risk of developing Alzheimer's disease. A

recent study found that Alzheimer's patients given an omega-3-rich supplement experienced a significant improvement in their quality of life.[6-9]

Several studies have established a clear association between low levels of omega-3 fatty acids and depression. Other studies have shown that countries with a high level of fish consumption have fewer cases of depression. Researchers at Harvard Medical School have successfully used fish oil supplementation to treat bipolar disorder (manic-depressive illness) and British researchers report encouraging results in the treatment of schizophrenia. [10-15]

An adequate intake of DHA and EPA is particularly important during pregnancy and lactation. During this time the mother must supply all the baby's needs for DHA and EPA because it is unable to synthesize these essential fatty acids itself. DHA makes up 15 to 20% of the cerebral cortex and 30 to 60% of the retina so it is absolutely necessary for normal development of the fetus and baby. There is some evidence that an insufficient intake of omega-3 fatty acids may increase the risk of premature birth and an abnormally low birth weight. There is also emerging evidence that low levels of omega-3 acids are associated with hyperactivity in children. [1, 3, 16-22]

The constant drain on a mother's DHA reserves can easily lead to a deficiency and some researchers believe that preeclampsia (pregnancy-related high blood pressure) and postpartum depression could be linked to a DHA deficiency. Experts recommend that women get at least 500-600 mg of DHA every day during pregnancy and lactation. The easiest way to ensure this intake is to take a good fish oil supplement daily. [17-19]

Researchers at the University of Sydney have found that children who regularly eat fresh, oily fish have a four times lower risk of developing asthma than do children who rarely eat such fish. They speculate that EPA present in the fish may prevent the development of asthma or reduce its severity by reducing airway inflammation and responsiveness. Researchers at the University of Wyoming have found that supplementation with 3.3 grams/day of fish oil markedly reduces breathing difficulties and other symptoms in asthma patients. Other research has found fish oil to be beneficial in the

treatment of other lung diseases such as cystic fibrosis and emphysema. [23-29]

### **The heart's best friend**

An enormous amount of medical literature testifies to the fact that fish oils prevent and may help to ameliorate or reverse atherosclerosis, angina, heart attack, congestive heart failure, arrhythmias, stroke, and peripheral vascular disease. Fish oils help maintain the elasticity of artery walls, prevent blood clotting, reduce blood pressure and stabilize heart rhythm. [1-4, 30-33]

Danish researchers have concluded that fish oil supplementation may help prevent arrhythmias and sudden cardiac death in healthy men. An Italian study of 11,000 heart attack survivors found that patients supplementing with fish oils markedly reduced their risk of another heart attack, a stroke or death. A group of German researchers found that fish oil supplementation for 2 years caused regression of atherosclerotic deposits and American medical researchers report that men who consume fish once or more every week have a 50% lower risk of dying from a sudden cardiac event than do men who eat fish less than once a month. [34-40]

Greek researchers report that fish oil supplementation (10 grams/day) reduces the number of attacks by 41% in men suffering from angina. Norwegian medical doctors have found that fish oil supplementation reduces the severity of a heart attack and Indian researchers report that supplementation started immediately after a heart attack reduces future complications. Bypass surgery and angioplasty patients reportedly also benefit from fish oils and clinical trials have shown that fish oils are safe for heart disease patients. The evidence is indeed overwhelming. An adequate daily intake (about 1 gram) of EPA and DHA is essential to maintain a healthy heart. Fish oils are especially important for diabetics who have an increased risk of heart disease. [41-49]

Researchers at the University of Cincinnati have found that supplementing with as little as 2 grams/day of fish oil (410 mg of EPA plus 285 mg of DHA) can lower diastolic pressure by 4.4 mm Hg and systolic pressure by 6.5 mm Hg in people with elevated blood pressure. Enough to avoid taking drugs in cases of borderline hypertension. Several other clinical trials have confirmed that fish oils are indeed effective in

lowering high blood pressure and that they may work even better if combined with a program of salt restriction. [50-55]

### **Reduces pain and helps prevent cancer**

Fish oils are particularly effective in reducing inflammation and can be of great benefit to people suffering from rheumatoid arthritis or ulcerative colitis. Daily supplementation with as little as 2.7 grams of EPA and 1.8 grams of DHA can markedly reduce the number of tender joints and increase the time before fatigue sets in. Some studies have also noted a decrease in morning stiffness and at least two clinical trials concluded that arthritis patients who took fish oils could eliminate or sharply reduce their use of NSAIDs and other arthritis drugs. [56-61]

Patients with ulcerative colitis have abnormally low blood levels of EPA. Clinical trials have shown that supplementation with fish oil (2.7 grams of EPA and 1.8 grams of DHA daily) can reduce the severity of the condition by more than 50% and enable many patients to discontinue anti-inflammatory medication and steroids. [62-64]

There is now also considerable evidence that fish oil consumption can delay or reduce tumor development in breast cancer. Studies have also shown that a high blood level of omega-3 fatty acids combined with a low level of omega-6 acids reduces the risk of developing breast cancer. Daily supplementation with as little as 2.5 grams of fish oils has been found effective in preventing the progression from benign polyps to colon cancer and Korean researchers recently reported that prostate cancer patients have low blood levels of omega-3 fatty acids. Greek researchers report that fish oil supplementation improves survival and quality of life in terminally ill cancer patients. [65-73]

### **Safe and easily available**

It is estimated that 85% or more of people in the Western world are deficient in omega-3 fatty acids and most get far too much of the omega-6 fatty acids. Vegetarian diets, for example, tend to be very high in omega-6.

The recommended daily intake of EPA plus DHA is about 650 mg rising to 1000 mg/day during pregnancy and lactation. Clinical trials have used anywhere from 1 g/day to 10 g/day, but

little additional benefit has been observed at levels above 5 g/day of EPA and DHA combined. The benefits of therapeutic supplementation may become evident in a few weeks when blood parameters (triglycerides, fibrinogen) are involved, but may take 3 months or longer to materialize in degenerative diseases like atherosclerosis and rheumatoid arthritis. [74, 75]

The processing and packaging of the fish oil are crucial in determining its quality. Low quality oils may be quite unstable and contain significant amounts of mercury, pesticides, and undesirable oxidation products. High quality oils are stabilized with adequate amounts of vitamin E and are packaged in individual foil pouches or other packaging impervious to light and oxygen. Some very recent research carried out at the University of Minnesota found that emulsified fish oils are much better absorbed than the straight oils in gelatin capsules. [76]

Cod liver oils and fish oils are not the same. Cod liver oil is extracted from cod liver and is an excellent source of vitamins A and D. Fish oils are extracted from the tissues (flesh) of fatty fish like salmon and herring and are good sources of EPA and DHA. Fish oils contain very little vitamin A and D, but cod liver oil does contain EPA and DHA. However, you would probably exceed the recommended daily intake of vitamins A and D if you were to try to obtain therapeutic amounts of EPA and DHA from cod liver oil.

Supplementing with fish oils has been found to be entirely safe even for periods as long as 7 years and no significant adverse effects have been reported in hundreds of clinical trials using as much as 18 grams/day of fish oils. Fish oil supplementation does, however, lower blood concentrations of vitamin E so it is a good idea to take extra vitamin E when adding fish oils to your diet. A clinical trial carried out by the US Department of Agriculture found that taking 200 mg/day of synthetic vitamin E (equivalent to about 100 IU of natural alpha-tocopherol) is sufficient to completely counteract this effect of fish oil supplementation. [74, 75, 77, 78]

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