Fish Oil

En Español (Spanish Version)

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Supplement Forms/Alternate Names
• Docosahexaenoic Acid (DHA); Eicosapentaenoic Acid (EPA); Omega-3 Fatty Acids; Omega-3 Oil(s)

Principal Proposed Uses
• Heart Disease Prevention; Rheumatoid Arthritis

Other Proposed Uses
• Allergies; Alzheimer’s Disease; Angina; Ankylosing Spondylitis; Anxiety; Asthma; Attention Deficit and Hyperactivity Disorder (ADHD); Bipolar Disorder (Manic-Depressive Illness); Borderline Personality Disorder; Cardiac Arrhythmia; Cancer Treatment Support; Chronic Fatigue Syndrome; Congestive Heart Failure; Crohn’s Disease; Depression; Diabetic Neuropathy; Dysmenorrhea (Menstrual Pain); Eczema (Prevention); Enhancing Memory and Mental Function; Epilepsy; Gout; HIV Support; Hypertension; Kidney Stones; Liver Disease; Lupus; Macular Degeneration; Male Infertility; Migraine Headaches; Multiple Sclerosis; Osteoporosis; Pregnancy Support (including postpartum depression); Prevention of Premature Birth; Prostate Cancer Prevention; Psoriasis; Raynaud’s Phenomenon; Retinitis Pigmentosa; Schizophrenia; Sickle-cell Anemia; Strokes (Prevention); Surgery Support; Ulcerative Colitis; Undesired Weight Loss Caused by Cancer

Fish oil contains omega-3 fatty acids, one of the two main classes of essential fatty acids. (Omega-6 fatty acids are the other main type.) Essential fatty acids are special fats that the body needs for optimum health.

Interest in the potential therapeutic benefits of omega-3 fatty acids began when studies of the Inuit (Eskimo) people found that, although their diets contain an enormous amount of fat from fish, seals, and whales, they seldom suffer heart attacks. This is presumably because those sources of fat are very high in omega-3 fatty acids.

Subsequent investigation found that the omega-3 fatty acids found in fish oil have various effects that tend to reduce risk of heart disease and strokes. However, research into whether use of fish oil actually prevents these diseases, while somewhat positive, remains incomplete and somewhat inconsistent. In recognition of this, the FDA has allowed supplements containing fish oil or its constituents to carry a label that states: "Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease."

In addition, a slightly modified form of fish oil (ethyl-omega-3 fatty acids) has been approved by the FDA as a treatment for hypertriglyceridemia (high triglycerides). This specially processed product, sold under the trade name Omacor, is widely advertised as more effective than ordinary fish oil. However, it should be noted that Omacor has undergone relatively little study itself; the physician prescribing information notes only two small trials to support its effectiveness for this use. This is a far lower level of evidence than usually required for drug approval and also substantially lower than the body of evidence supporting standard fish oil as a treatment for high triglycerides.

Fish oil has also shown promise as an anti-inflammatory treatment for conditions such as rheumatoid arthritis, menstrual pain, and lupus. In addition, it may be helpful for various psychiatric conditions.
Requirements/Sources

There is no daily requirement for fish oil. However, a healthy diet should provide at least 5 g of essential fatty acids daily.

Many grains, fruits, vegetables, sea vegetables, and vegetable oils contain significant amounts of essential omega-6 and/or omega-3 fatty acids, but oil from cold-water fish is the richest natural source of omega-3 fats. It is commonly stated that people require a certain optimum ratio of omega-3 to omega-6 fatty acids in the diet; however, there is no real evidence that this is true, and some evidence that it is false.231

Therapeutic Dosages

Typical dosages of fish oil are 3 g to 9 g daily, but this is not the upper limit. In one study, participants ingested 60 g daily.

The most important omega-3 fatty acids found in fish oil are called eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). In order to match the dosage used in several major studies, you should take enough fish oil to supply about 2 g to 3 g of EPA (2,000 mg to 3,500 mg) and about 1.0 g to 2.5 g of DHA daily (1,000 mg to 2,500 mg). Far higher doses have been used in some studies; conversely, one study found blood-pressure lowering effects with a very low daily dosage of DHA—0.7 g.238

DHA and EPA are not identical and might not have identical effects. Some evidence hints that DHA may be more effective than EPA for thinning the blood176 and reducing blood pressure.105 The reverse may be true for reducing triglyceride levels, but study results are conflicting.100-105,238

Some manufacturers add vitamin E to fish oil capsules to keep the oil from becoming rancid. Another method is to remove all the oxygen from the capsule.

If possible, purchase fish oil products certified as free of significant levels of mercury, toxic organochlorines, and PCBs (see Safety Issues).

Flaxseed oil also contains omega-3 fatty acids, although of a different kind. It has been suggested as a less smelly substitute for fish oil. However, it is far from clear whether flaxseed oil is therapeutically equivalent to fish oil.1,200

Therapeutic Uses

Consumption of fish oil alters the body’s production of certain substances in the class of chemicals called prostaglandins. Some prostaglandins increase inflammation while others decrease it. The prostaglandins whose production is enhanced by fish oil fall into the anti-inflammatory category. Based on this, fish oil has been tried as a treatment for early stages of rheumatoid arthritis, with positive results. It is thought to significantly reduce symptoms without causing side effects and may magnify the benefits of standard arthritis drugs.37,38,179 However, while some standard medications can slow the progression of the disease, there is no evidence that fish oil can do this. Much weaker evidence hints that fish oil might be helpful for the related disease ankylosing spondylitis.232

Fish oil’s apparent anti-inflammatory properties are the likely explanation for its apparent benefit in dysmenorrhea (menstrual pain), as seen in two studies.39,40 Similarly, fish oil may be helpful for the autoimmune
Some, but not all, studies suggest that fish oil combined with omega-6 essential fatty acids may augment the effectiveness of calcium in the treatment of osteoporosis. Incomplete evidence hints but does not prove that fish or fish oil might help prevent death caused by heart disease. This effect seems to result from several separate actions. The best documented involves reducing high triglyceride levels; studies enrolling more than 2,000 people have substantiated this use. In addition, fish oil might raise HDL (“good”) cholesterol levels, “thin” the blood, lower levels of homocysteine, prevent dangerous heart arrhythmias, slow heart rate, improve blood vessel tone, and decrease blood pressure. These effects also support findings that fish oil may help prevent strokes. However, results are conflicting on whether people with angina should take fish oil or increase intake of fatty fish; one large study actually found that fish oil increased risk of sudden death.

For a number of theoretical reasons, it has been suggested that fish oil and its constituents (especially a slightly modified form of EPA called ethyl-EPA) might have positive effects on various psychiatric disorders, most notably depression. However, there is no convincing evidence that low levels of omega-3 fatty acids in the bloodstream leads to even mild depression. Moreover, larger trials have generally failed to demonstrate a beneficial effect of fish oil-related products in depressed patients. Some evidence hints that high doses of fish oil may produce benefits in bipolar disorder, reducing risk of relapse and improving emotional state. Other preliminary, and again not altogether consistent, evidence hints that fish oil might enhance the effectiveness of standard drugs (such as phenothiazines) for schizophrenia.

One trial of 81 adolescents and young adults (considered at very high risk) found that daily omega-3 fatty acid supplements for 12 weeks delayed transition to a first full-blown psychotic episode (e.g., schizophrenia) within one year. Fish oil has also shown a bit of promise for borderline personality disorder. In one study, DHA failed to augment the effectiveness of standard therapy for attention deficit disorder (ADD). However, two studies that evaluated the potential benefits of fish oil combined with omega-6 fatty acids found some evidence of benefit for this condition. Finally, one small trial found evidence that use of fish oil might decrease anger and aggressiveness in people with a history of aggressive behaviors, substance abuse, and problems with the law.

Small studies also suggest that fish oil may be helpful in Raynaud’s phenomenon (a condition in which a person’s hands and feet show abnormal sensitivity to cold temperatures), sickle-cell anemia, and a form of kidney disease called IgA nephropathy.

According to some, but not all studies, fish oil may help treat the undesired weight loss often experienced by people with cancer. In addition, highly preliminary evidence hints that DHA might enhance the effects of the cancer chemotherapy drug doxorubicin and decrease side effects of the chemotherapy drug irinotecan.

Use of fish oil by pregnant women might help prevent premature birth, although evidence is somewhat inconsistent. In addition, use of fish oil by pregnant women may support healthy brain function and help prevent eczema and allergies in offspring.

Intriguing, but not yet at all reliable, evidence hints that fish oil, or its constituents, might be helpful for treating kidney stones or alleviating the symptoms of chronic fatigue syndrome, and reducing the risk of prostate cancer. Results are inconsistent regarding whether the use of fish oil can decrease seizure frequency in people with epilepsy.

One study found that insulin metabolism in 278 young, overweight subjects improved on a calorie-restricted diet rich in fish oil from seafood or supplements compared to those on a diet low in fish oil, suggesting that fish oil may help delay the onset of diabetes in susceptible individuals. Fish oil has also been proposed as a treatment for many other conditions, including diabetic neuropathy, allergies, and gout, but there has been little real scientific investigation of these uses.

Some, but not all, studies suggest that fish oil combined with omega-6 essential fatty acids may augment the effectiveness of calcium in the treatment of osteoporosis. One promising, but highly preliminary,
double-blind, placebo-controlled study suggests that the same combination therapy may improve symptoms of the severe neurological illness called Huntington’s disease.\textsuperscript{155}

Use of a fish oil product as part of a total parenteral nutrition regimen (intravenous feeding) may help speed recovery after major abdominal surgery.\textsuperscript{213}

For several other conditions, the current balance of the evidence suggests that fish oil is not effective.

For example, despite widely publicized claims that fish oil helps asthma, most preliminary studies have failed to provide evidence that it is effective, and one study found that fish oil can actually worsen aspirin-related asthma.\textsuperscript{69-77,171,271} However, there is some evidence that use of fish oil could help prevent exercise-induced asthma in athletes.\textsuperscript{196,212} And, in an interesting randomized, controlled trial with long-term follow-up, mothers who take fish-oil during late pregnancy reduced the risk of asthma in their children up to 16 years later.\textsuperscript{263}

At least two studies, including a systematic review of 4 trials, have not found evidence to support the use of fish oil for improving lung function in people with cystic fibrosis.\textsuperscript{251,281}

A 16-week, double-blind, placebo-controlled study of 167 individuals with recurrent migraine headaches found that fish oil did not significantly reduce headache frequency or severity.\textsuperscript{149} Conflicting results have been seen in other, much smaller trials of fish oil for migraines.\textsuperscript{172,173}

One study found weak evidence that use of fish oil might decrease aggressive behavior in young girls (but, in this study, not in young boys).\textsuperscript{213} Another study found benefit in developmental coordination disorder (a condition in which children suffer from lack of physical coordination as well as problems with learning and behavior).\textsuperscript{214}

Fish oil is also sometimes recommended for enhancing immunity in HIV infection. However, one 6-month, double-blind study found that a combination of the omega-3 fatty acids in fish oil plus the amino acid arginine was no more effective than placebo in improving immune function in people with HIV.\textsuperscript{78} Fish oil, however, might help individuals with HIV gain weight.\textsuperscript{79}

In one large, randomized, controlled trial, diets rich in fish and omega-3 fatty acids from fish were associated with a significant reduction in the risk of developing colorectal cancer among men over a 22-year period.\textsuperscript{255} Another study provides preliminary evidence for the benefits of fish oil in reducing the risk of prostate cancer.\textsuperscript{57} On balance, however, there is still relatively little evidence that the consumption of fish oil reduces cancer risk.\textsuperscript{215}

Preliminary studies have suggested that fish oil could help symptoms of multiple sclerosis; however, the largest double-blind study on the subject found no difference between people taking fish oil and those taking olive oil (used as a placebo).\textsuperscript{80-84,216}

Although one study found fish oil somewhat helpful in psoriasis,\textsuperscript{133} a much larger study found no benefit.\textsuperscript{134}

DHA has been evaluated as a possible treatment for male infertility, but a double-blind trial of 28 men with impaired sperm activity found no benefit.\textsuperscript{58}

Combination therapy with GLA and fish oil has failed to prove effective for cyclic breast pain.\textsuperscript{186}

One study failed to find fish oil more effective than placebo for treating stress.\textsuperscript{217} DHA has also been tried for slowing the progression of retinitis pigmentosa (a condition in which the retina gradually degenerates), but without much success.\textsuperscript{210-211} In observational studies, people who happen to consume a diet rich in omega-3 fatty acids seem to lower their risk of age-related macular degeneration (the most common cause of blindness in the elderly). However, in the absence of randomized controlled trials, it is not possible to say whether or not it is omega-3 that produces this benefit.\textsuperscript{360}

Studies of fish oil have failed to find it helpful for Alzheimer’s disease, whether for slowing its progression or improving symptoms.\textsuperscript{230,240} In addition, two randomized trials have failed to find any benefit of fish oil for enhancing memory and mental function in older adults without dementia.\textsuperscript{265,380}
Use of essential fatty acids in the omega-3 family has also shown some promise for the treatment of non-alcoholic fatty liver.\textsuperscript{245,270}

A 12-week, double-blind, placebo-controlled trial involving 68 healthy medical students without anxiety disorders found that taking fish oil supplements may reduce anxiety (ie, stress related to test taking).\textsuperscript{262}

What Is the Scientific Evidence for Fish Oil?

Heart Disease Prevention

Studies on fish or fish oil for preventing cardiovascular disease, slowing the progression of cardiovascular disease, and preventing heart-related death have returned somewhat contradictory results.\textsuperscript{106-125,150,156} A major review published in 2004 failed to find trustworthy evidence of benefit,\textsuperscript{218} and a subsequent study actually found that use of fish oil increases risk of sudden death in people with stable heart disease.\textsuperscript{219} A 2008 systematic review found that fish oil was associated with modestly reduced cardiac mortality, but not sudden cardiac death, in 11 studies totally over 32,000 patients. The reliability of these results, however, is limited by the inclusion of mostly low-to-moderate quality trials.\textsuperscript{222} Though not entirely consistent, on balance the evidence does suggest that regularly consuming oily fish or taking omega-3 fatty acid supplements can reduce the risk of cardiovascular events (eg, heart attacks) and deaths.\textsuperscript{261} A 2009 review pooled data from 8 trials examining the effect of omega-3 fatty acids on prevention of cardiac death in almost 21,000 patients with coronary heart disease.\textsuperscript{274} This review separated patients into two general groups (those with previous myocardial infarction versus those with angina history) and found that omega-3 supplementation reduced risk of sudden cardiac death in patients with previous myocardial infarction, but increased risk in patients with angina. Though compelling, this finding may be limited since it was derived from a retrospective analysis of original data reorganized into subgroups.

A gigantic study (over 18,000 participants) published in 2007 was widely described in the media as finally proving beyond a shadow of a doubt that fish oil helps prevent heart problems.\textsuperscript{239} Unfortunately, this study lacked a placebo group, and therefore failed to provide reliable evidence.

As noted earlier, fish oil is hypothesized to exert several separate effects that act together to help protect the heart. The most important action of fish oil may be its apparent ability to reduce high triglyceride levels. Like cholesterol, triglycerides are a type of fat in the blood that tends to damage the arteries, leading to heart disease. According to most, though not all, studies, fish oil supplements can reduce triglycerides by as much as 25\% to 30\%.\textsuperscript{90-93,151,256} In a detailed review of 47 randomized trials, researchers concluded that fish oil is capable of significantly reducing triglyceride levels with no change in total cholesterol levels and only slight increases in HDL (“good”) cholesterol and LDL (“bad”) cholesterol.\textsuperscript{268} A slightly modified form of fish oil (ethyl-omega-3 fatty acids) has been approved by the FDA as a treatment for elevated triglycerides. However, in some studies, use of fish oil has markedly raised LDL cholesterol, which might offset some of the benefit. A 2009 review of 30 trials involving about 1,500 patients with type 2 diabetes demonstrated that marine-derived omega-3 polyunsaturated fatty acids (mean dose 2.4 g per day) lowered triglyceride levels about 15 mg/dL but increased LDL cholesterol by about 3 mg/dL after an average 24 weeks of treatment.\textsuperscript{275}

Stanols and sterols (or phytosterols) are naturally occurring substances found in various plants that can help to lower cholesterol in individuals with normal or mildly to moderately elevated levels. A study investigating the possible benefit of combining a phytosterol with fish oil found that together they significantly lowered total cholesterol, LDL-cholesterol and triglycerides, and raised HDL (“good”) cholesterol in subjects with undesirable cholesterol profiles.\textsuperscript{257}

Fish oil has been specifically studied for reducing triglyceride levels in people with diabetes, and it appears to do so safely and effectively.\textsuperscript{3,262} It also seems to remain effective in individuals who are already using statin drugs to control lipid levels (both people with and without diabetes).\textsuperscript{14,15,197} However, one study found that the standard drug gemfibrozil is more effective than fish oil for reducing triglycerides.\textsuperscript{94}
Some but not all studies suggest that fish, fish oil, or EPA or DHA separately may additionally raise the level of HDL ("good") cholesterol and possibly improve other aspects of cholesterol profile as well.\(^{96,97,151,164,165,197}\) This too should help prevent heart disease.

Additionally, fish oil may help the heart by "thinning" the blood and by reducing blood levels of homocysteine,\(^{98,176,190}\) although not all studies have found a positive effect.\(^{198}\)

Studies contradict one another on whether fish oil can lower blood pressure,\(^{99-104,177,264}\) but on balance the supplement does seem to exert a modest positive effect.\(^{174}\) A 6-week, double-blind, placebo-controlled study of 59 overweight men suggests that the DHA in fish oil, but not the EPA, is responsible for this benefit.\(^{105}\)

A large Italian trial involving almost 7,000 subjects found that fish oil may modestly reduce the risk of death or admission to the hospital for cardiovascular reasons in patients suffering from congestive heart failure.\(^{266}\) And, a smaller study involving 138 patients showed similarly beneficial results.\(^{279}\)

Evidence is conflicting on whether fish oil helps prevent arrhythmias.\(^{220-224,248,285}\) In a 2010 study involving 663 people with intermittent atrial fibrillation (the most common cause of arrhythmia), fish oil was no more effective than placebo at reducing the number symptomatic episodes over a 24-week period.\(^{278}\)

Fish oil may slightly reduce heart rate.\(^{225}\) This effect could contribute to preventing heart attacks and other heart problems.

**Rheumatoid Arthritis**

The results of numerous small double-blind trials indicate that omega-3 fatty acids in fish oil can help reduce the symptoms of rheumatoid arthritis.\(^{126,127,179,187}\) At least one small study suggests that it may help rheumatoid arthritis patients lower their dose of nonsteroidal anti-inflammatory medication (eg, ibuprofen).\(^{254}\) The benefits of the fish oil effect may be enhanced by a vegetarian diet.\(^{187}\) Simultaneous supplementation with olive oil (about two teaspoons daily) may further increase the benefits.\(^{226}\) However, unlike some conventional treatments, fish oil probably does not slow the progression of rheumatoid arthritis.

**Menstrual Pain**

Regular use of fish oil may reduce the pain of menstrual cramps.

In a 4-month study of 42 young women aged 15 to 18, half the participants received a daily dose of 6 g of fish oil, providing 1,080 mg of EPA and 720 mg of DHA daily.\(^{128}\) After 2 months, they were switched to placebo for another 2 months. The other group received the same treatments in reverse order. The results showed that these young women experienced significantly less menstrual pain while they were taking fish oil.

Another double-blind study followed 78 women, who received either fish oil, seal oil, fish oil with vitamin B\(^{12}\) (7.5 mcg daily), or placebo for three full menstrual periods.\(^{129}\) Significant improvements were seen in all treatment groups, but the fish oil plus vitamin B\(^{12}\) proved most effective, and its benefits continued for the longest time after treatment was stopped (3 months). The researchers offered no explanation why vitamin B\(^{12}\) should be helpful.

**Bipolar Disorder**

A 4-month, double-blind, placebo-controlled study of 30 individuals suggests that fish oil can enhance the effects of standard treatments for bipolar disorder, reducing risk of relapse and improving emotional state.\(^{130}\) Eleven of the 14 individuals who took fish oil improved or remained well during the course of the study, while only 6 out of the 16 given placebo responded similarly. In addition, a systematic review of 6 randomized trials involving 320 people found that those who took omega-3 fatty acids had an improvement in their bipolar depression symptoms.\(^{284}\) A small study also found that ethyl-EPA (a modified form of EPA) is helpful for the depressive phase of bipolar disease.\(^{227}\)
Depression

A 4-week, double-blind, placebo-controlled trial evaluated the potential benefits of fish oil in 20 individuals with depression. All but one participant were also taking standard antidepressants and had been taking them for at least 3 months. By week 3, the level of depression had improved to a significantly greater extent in the fish oil group than in placebo group. Six of 10 participants given fish oil, but only one of 10 given placebo, showed at least a 50% reduction in depression scores by the end of the trial. (A reduction of this magnitude is considered a “cure.”)

A double-blind, placebo-controlled study of 70 people who were still depressed despite standard therapy (such as SSRIs) found that additional treatment with ethyl-EPA (a modified form of EPA) improved symptoms. Similar add-on benefits were also seen in other double-blind studies of ethyl-EPA or mixed essential fatty acids. However, one study failed to find benefit with fish-oil as an add-on treatment. Another double-blind study failed to find DHA alone helpful for depression. A third relatively large placebo-controlled study found no benefit for fish oil in improving “mental well-being” among 320 older adults without a diagnosis of depression.

Postpartum Depression

The effectiveness of fish oil supplementation in treating or preventing perinatal (including postpartum) depression is, as of yet, unclear. A small preliminary study of women found that fish oil was significantly more effective than placebo at alleviating postpartum depression. However, another small, placebo-controlled study was unable to show a benefit in women suffering from depression whether before or after delivery. In addition, a 2009 trial of 182 pregnant women with suspected low intake of DHA found that daily DHA supplementation (with or without arachidonic acid) did not reduce risk of postpartum depression compared to placebo. And, in another much larger study involving 2,399 women, researchers found that fish oil capsules (a combination of DHA 800 mg/day and EPA 100 mg/day) did not prevent postpartum depression. Interestingly, it also did not improve the cognitive and language development in their children up to four years after their birth.

Raynaud's Phenomenon

In small, double-blind studies, fish oil has been found to reduce the severe finger and toe responses to cold temperatures that occur in Raynaud's phenomenon. However, these studies suggest that a higher than usual dosage must be used to get results, perhaps 12 g daily.

Osteoporosis

There is some evidence that essential fatty acids may enhance the effectiveness of calcium in osteoporosis. In one study, 65 postmenopausal women were given calcium along with either placebo or a combination of omega-6 fatty acids (from evening primrose oil) and omega-3 fatty acids (from fish oil) for a period of 18 months. At the end of the study period, the group receiving essential fatty acids had higher bone density and fewer fractures than the placebo group. However, a 12-month, double-blind trial of 42 postmenopausal women found no benefit.

The explanation for the discrepancy may lie in the differences between the women studied. The first study involved women living in nursing homes, while the second studied healthier women living on their own. The latter group of women may have been better nourished and already received enough essential fatty acids in their diet.

Lupus

Lupus is a serious autoimmune disease that can cause numerous problems, including fatigue, joint pain, and kidney disease. One small, 34-week, double-blind, placebo-controlled crossover study compared placebo against daily doses of EPA (20 g) from fish oil. A total of 17 individuals completed the trial. Of these, 14 showed
improvement when taking EPA, while only 4 did so when treated with placebo. Another small study found similar benefits with fish oil over a 24-week period. However, two small studies failed to find fish oil helpful for lupus nephritis (kidney damage caused by lupus).

**Attention Deficit and Hyperactivity Disorder (ADHD)**

Based on evidence that essential fatty acids are necessary for the proper development of brain function in growing children, EFAs have been tried for the treatment of ADHD and related conditions. The results have been mixed. A preliminary double-blind, placebo-controlled trial found some evidence that a supplement containing fish oil and evening primrose oil might improve ADHD symptoms. However, a high drop-out rate makes the results of this trial unreliable. In a double-blind, placebo-controlled trial of children already using stimulant therapy, addition of DHA for 4 months failed to further improve symptoms. A systematic review produced slightly more promising results, though. In the review, 10 randomized trials involving 699 children with ADHD found that those who took omega-3 fatty acids experienced a modest improvement in certain symptoms like inattentiveness and hyperactivity. Another small study examined fish oil in children with ADHD who had thirst and skin problems. Benefits were seen with fish oil, but they also occurred with placebo and to about the same extent.

**Safety Issues**

Fish oil appears to be generally safe. The most common problem is fishy burps. However, there are some safety concerns to consider.

For example, it has been suggested that some fish oil products contain excessive levels of toxic substances such as organochlorines and PCBs. If possible, try to purchase fish oil products certified not to contain significant levels of these contaminants. **Note:** Various types of fish contain mercury, but this has not been a problem with fish oil supplements, according to reports on Consumerlab.com.

Fish oil has a mild blood-thinning effect; in one case report, it increased the effect of the blood-thinning medication warfarin (Coumadin). Fish oil does not seem to cause bleeding problems when it is taken by itself or with aspirin. Nonetheless, people who are at risk of bleeding complications for any reason should consult a physician before taking fish oil.

Fish oil does not appear to raise blood sugar levels in people with diabetes. Nonetheless, if you have diabetes, you should not take any supplement except on the advice of a physician.

Fish oil may modestly increase weight and lower total cholesterol and HDL (“good”) cholesterol levels. It may also raise the level of LDL (“bad”) cholesterol; however, this effect may be short-lived.

If you decide to use cod liver oil as your fish oil supplement, make sure you do not exceed the safe maximum intake of vitamin A and vitamin D. These vitamins are fat soluble, which means that excess amounts tend to build up in your body, possibly reaching toxic levels. The official maximum daily intake of vitamin A is 3,000 mcg for pregnant women as well as other adults. Look at the bottle label to determine how much vitamin A you are receiving. (It is less likely that you will get enough vitamin D to produce toxic effects.)

**Interactions You Should Know About**

If you are taking warfarin (Coumadin) or heparin, do not take fish oil except on the advice of a physician.
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