

# The Lure of Fish Oils

## Omega-3 fatty acids are linked to healthy hearts, but their benefits may stretch beyond.

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Eyeing some salmon or sardines in the grocery store, you may soon notice some not-very-snappy words on the labels, suggesting the contents may be good for you.

Last month, the Food and Drug Administration allowed the following "qualified" health claim for certain foods containing fish oils: "Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease."

Or, as Madison Avenue might prefer to put it: "Fish oils! They're healthy! And they're not just about fish anymore!" Or they won't be for long if food companies have anything to do with it.

As studies pile up linking omega-3 fish oils (and possibly plant ones too) to healthy hearts, food businesses — cognizant of the fact that fish is not universally adored — are busy figuring out how to get omega-3s into juice, yogurt, salad dressings, margarine, meat, milk, bread, you name it.

Consumers who weathered the fiber fad and other flash-in-the-pan nutrient crazes may be forgiven for rolling their eyes. The two fatty acids in question — eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) — are purported to help your heart, your immune system, your mood, your aging brain and your dimming eyes, and possibly even to ward off cancer. The list seems optimistically long. Perhaps it's just a matter of time before this latest miracle-food-on-the-block fizzles. Or maybe it won't.

Nutrition scientists and cardiologists wax enthusiastic on the matter of fish oils because they believe the oils' benefits in lowering death from heart attacks have been well shown. (The other health links, although intriguing, remain tenuous.) The American Heart Assn. recommends that healthy adults consume two servings of preferably oily fish per week and that people who already have heart disease or elevated blood levels of triglycerides aim for even higher levels of omega-3 fatty acids in their diet. In August, a panel of scientists helping update the Dietary Guidelines for Americans (government eating advice that shapes federal nutrition policy) also recommended that Americans raise their fish intake to two 4-ounce servings per week; Americans, on average, consume less than 3 ounces of nonfatty fish.

The FDA action marks the second time the agency has allowed a qualified health claim for a conventional food product; earlier this year, the agency granted a claim linking

walnuts and certain other nuts to a reduction in heart disease risk.

"I know we got burned with vitamin E, and fiber was another one, and I think that soy protein was another, but this seems to be more constant," says Alice Lichtenstein, a professor at the Friedman School of Nutrition Science and Policy at Tufts University in Boston. "All the results seem to be going in about the same direction.... [The link is] very consistent and strong."

In fact, some scientists suspect that, when it comes to oils, our diet these days is plain out of balance. Compared to what people ate in the past, levels of omega-3s have steadily declined, nudged out by other types of oils.

### **Greenland connection**

Omega-3 fatty acids are long chains of carbons that are polyunsaturated, meaning they contain several double bonds. They're called omega-3s because the first double bond in the string is positioned three places from the chain's end. When three of the fatty acids are linked to a chemical called a glycerol, they make an oil.

Grandma may have sworn by cod liver oil, but to scientists the fish oil-heart health link dates from the late 1970s, forged by Danish investigators studying the indigenous peoples of Greenland. The scientists noted that although the Inuit had diets loaded with fat, their death rates from heart attacks were significantly lower than the Danes'.

Perhaps, reasoned the investigators, this might have something to do with the type of fats being eaten — a lot of oils from seal and fish for the people of Greenland compared with saturated fats from the milk-, cheese- and meat-rich diets enjoyed by the Danes.

Other population studies and animal studies fueled this hypothesis. For instance, when monkeys and dogs were fed fish oil-rich diets, their hearts were less likely to go into spasms (known as arrhythmias) after heart attacks. Such arrhythmias prevent the heart from pumping blood. Carefully designed clinical trials also support the antiarrhythmia link.

In one large Italian study, 11,324 men and women with preexisting heart disease were given 850 milligrams a day of fish omega-3s, a placebo or vitamin E. The vitamin and placebo did nothing. But 3 1/2 years later, fish oil-takers were 15% less likely to have died or had a nonfatal heart attack or stroke. Most strikingly, their rate of sudden death — in other words, death within one hour of the heart attack — was 45% lower than for those who took placebos.

In another study, men who had suffered heart attacks were counseled to eat more oily fish — and, two years later, were 29% less likely to have died, especially of a fatal heart attack. Scientists now believe that the fish oils act by taking up residence in the membranes of heart cells and alter the cells' electrical properties, making it harder for the dangerous spasms to start.

"If you have a heart attack — heaven forbid — the fatty acids are already in the heart ... and prevent arrhythmia," says Dr. Alexander Leaf, emeritus professor of clinical medicine at Harvard Medical School and Massachusetts General Hospital.

The link to arrhythmias is the most substantiated, but fish oils may also have other heart-friendly effects, such as lowering the levels of triglycerides in the blood, reducing inflammation, slowing coronary artery thickening and reducing the tendency of blood to clot.

And the oils' reach may turn out to stretch beyond the heart. For instance, population studies in the Netherlands and the United States have reported that people who said they ate fish once weekly or more were 60% less likely to develop Alzheimer's disease in subsequent years. Greg Cole, associate director of UCLA's Alzheimer's Disease Research Center, says this could be because DHA is crucial for the proper working of brain cells and is destroyed during the course of Alzheimer's disease.

Cole and co-workers recently reported that mice with an Alzheimer's-like condition performed better in memory tests when fed DHA than when fed safflower oil, which does not contain omega-3s. Scientists in Oregon are conducting a small pilot study to see if Alzheimer's progression is slowed by fish oil supplements in men and women with mild cognitive impairment.

Mood too has been linked to levels of fish oil consumption — maybe again because a lack of omega-3s in the brain contributes to some abnormalities therein. In 1998, Dr. Joseph Hibbeln of the National Institutes of Health published a survey revealing that countries with the highest rates of depression ate the least fish, while those with the lowest ate the most.

Several small clinical trials have reported that fish oils helped improve psychiatric symptoms. One found that bipolar patients given fish oils had improved symptoms, another that supplements of EPA were more effective than placebos at improving the mood of depressed patients.

There are also data suggesting omega-3s may be helpful for a raft of other ills such as aggression, attention-deficit disorder, macular degeneration, autoimmune diseases and breast cancer. "You'll hear all sorts of things," says Penny Kris-Etherton, distinguished professor of nutrition at Pennsylvania State University in University Park, who co-wrote the American Heart Assn.'s recommendations and reviewed omega-3s for the next version of America's dietary guidelines. "I think this definitely is an emerging area."

### **What to consider**

Ultimately, even if omega-3s are proven only to reduce the risk of deadly arrhythmias after a heart attack, that's ample reason to pay attention. According to the National Institutes of Health, more than 1 million people in the U.S. have a heart attack and

515,000 die each year, usually from arrhythmias.

Here, gleaned from omega-3 experts, are things to consider when thinking about increasing your fish oil intake:

- The American Heart Assn. recommends that healthy adults, especially those at higher risk for heart disease, sample a variety of fish at least twice weekly — preferably oily fish such as salmon, mackerel, sardines, herring and trout. These are the richest in the two fish omega-3s, DHA and EPA. The heart association also recommends increasing intake of a different type of omega-3, known as alpha-linolenic acid, which is abundant in walnuts, flax seeds, and canola and soybean oils.

People with preexisting heart disease should try to consume 1 gram of omega-3 oils each day, preferably from food. Individuals who need their blood triglycerides lowered may need an even bigger dose: 2 to 4 grams daily, which will presumably mean supplements (it's hard to eat *that* much fish).

- Be mindful of, but not overly concerned about, potential contaminants in fish. We've all read about the problems of mercury in big fish like tuna, and in January a group of scientists reported that farmed salmon (about 90% of the fresh salmon found in supermarkets) contained 10 times more PCBs (polychlorinated biphenyls), dioxins and other potentially cancer-causing industrial chemicals than did wild salmon. The chemicals were acquired from the oil and the meal the fish were fed. The levels exceeded safety levels set by the federal Environmental Protection Agency for sport-caught fish.

"I advise consumers not to eat farmed salmon until the industry changes the way it feeds the salmon," says David Carpenter, a coauthor of the study and director of the Institute for Health and the Environment at the University at Albany in New York.

But many nutrition scientists disagree that the PCB levels pose a risk. "I feel very strongly that people should eat salmon of all kinds — farmed, wild, whatever," says Mark Kantor, associate professor of nutrition and food science at the University of Maryland in College Park. Kantor and others say that the amounts of these chemicals in farmed salmon are still far below the safety levels set by the FDA.

- Consider fish oil pills and capsules. Clinical trials have shown that capsules, not merely fish, protect the heart, and a 2003 Consumer Reports test showed that 16 major fish oil supplements contained the advertised content of EPA and DHA, that the oils were in good shape and that contaminant levels were insignificant. Best bet: Check the label for the EPA/DHA levels, then pick your fish oil supplement based on price.

If you can't eat fish oils, another alternative is a supplement of DHA extracted from algae — but experts point out that none of the clinical trials were conducted with DHA alone, so there's more uncertainty regarding the benefits. "The safest thing is to get both of them," says William Harris, professor of medicine at the University of Missouri in Kansas City.

- For a few, fish oil supplements may have side effects. Because of the oils' anti-clotting clout, people prone to excessive bleeding should take the supplements with caution. Other side effects from eating the oils are a fishy aftertaste or upset stomach. But at higher doses diabetics and borderline diabetics may experience a worsening of blood sugar control, and people with high blood triglyceride levels may find their LDL (or "bad") cholesterol levels go up.
- Plant sources are a possibility — but you won't be getting the same substance as you would if you ate fish. Alpha-linolenic acid, the plant omega-3 abundant in walnuts, flax seeds and canola oil, is an essential oil: The Institute of Medicine recommends we eat at least a gram of it a day through food. In the body, ALA very slowly converts to DHA and EPA. But controlled clinical trials haven't shown that ALA protects the heart, although population studies suggest that it does.
- Consider omega-3-rich eggs (but because of their cholesterol, don't overdo it). These are derived from feeding either fish meal, plant oils or DHA obtained from algae to chickens. Since the plant-based sources aren't rigorously shown to be heart-protective, nutrition experts recommend choosing the algae or fish oil eggs over the ALA ones — although an ALA egg may be better than a standard one.

As for the future: Supermarket aisles may soon dance with omega-3 products once scientists have ironed out a few creases — such as how to keep the oils stable so they don't develop an "off" taste. "Any food that has oils ... could have this stuff in them — you could put them in salad dressings, margarine, bread, ice creams," says Harris. "Food tech folks can do all kinds of stuff."

### **Sources of omega-3 fatty acids**

Fish contain EPA and DHA, omega-3 fatty acids that have health benefits for the heart. Each 3-ounce portion (about the size of a fist) contains the following amounts of EPA and DHA, in grams. (The protective effects of the fish oils occur at intakes of half a gram.) Some plant sources are rich in an omega-3 fatty acid known as alpha-linolenic acid, or ALA, which is slowly converted to fish-like omega-3 fatty acids in our bodies. The benefits of consuming ALA have not been well established.

#### **Tuna**

light, canned in water...0.26  
white, canned in water ...0.73

#### **Salmon**

chum...0.68  
sockeye...0.68  
pink...1.09  
chinook...1.48  
Atlantic, farmed...1.09-1.83  
Atlantic, wild...0.9-1.56

**Sardines**...0.98-1.7

**Mackerel**...0.34-1.57

**Herring**...1.81

**Rainbow trout**

farmed...0.98

wild...0.84

**Pacific oysters**...1.17

**Alaskan king crab**...0.35

**Shrimp**, mixed species...0.27

**Fish oil supplements**

(grams of EPA and DHA,  
combined, per pill)...0.20 to 0.50

**Nuts and seeds** (per ounce)

walnuts...2.60

flax seeds...1.80

pecans (dry roasted)...0.03

**Oils** (per tablespoon)

flax seed oil...6.90

walnut oil...1.40

canola oil...1.30

olive oil...0.10

**Omega-3 enhanced eggs**

(contain omega-3s from plants, fish or algae)...0.13 to 0.40