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Omega-3 Supplements: An Introduction



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Omega-3 fatty acids (omega-3s) are a group of polyunsaturated fatty acids that are important for a number of functions in the body. Some types of omega-3s are found in foods such as fatty fish and shellfish. Another type is found in some vegetable oils. Omega-3s are also available as dietary supplements. This fact sheet provides basic information about omega-3s—with a focus on dietary supplements, summarizes scientific research on effectiveness and safety, and suggests sources for additional information.

Key Facts

- There has been a substantial amount of research on supplements of omega-3s, particularly the types of omega-3s found in seafood and fish oil, and heart disease. The findings of individual studies have been inconsistent. In 2012, two combined analyses of the results of these studies did not find convincing evidence that these omega-3s protect against heart disease.
- There is some evidence that omega-3s of the types found in seafood and fish oil may be modestly helpful in relieving symptoms in rheumatoid arthritis. For most other conditions for which omega-3s have been studied, definitive conclusions cannot yet be reached, or studies have not shown omega-3s to be beneficial.
- Omega-3 supplements may interact with drugs that affect blood clotting.
- It is uncertain whether people with fish or shellfish allergies can safely consume fish oil supplements.
- Fish liver oils (which are not the same as fish oils) contain vitamins A and D as well as omega-3 fatty acids; these vitamins can be toxic in high doses.
- Tell all your health care providers about any complementary health approaches you use. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care.

U.S. DEPARTMENT OF HEALTH
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National Institutes of Health
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About Omega-3 Fatty Acids

The three principal omega-3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). The main sources of ALA in the U.S. diet are vegetable oils, particularly canola and soybean oils; flaxseed oil is richer in ALA than soybean and canola oils but is not commonly consumed. ALA can be converted, usually in small amounts, into EPA and DHA in the body. EPA and DHA are found in seafood, including fatty fish (e.g., salmon, tuna, and trout) and shellfish (e.g., crab, mussels, and oysters).

Commonly used dietary supplements that contain omega-3s include fish oil (which provides EPA and DHA) and flaxseed oil (which provides ALA). Algae oils are a vegetarian source of DHA.

Omega-3 fatty acids are important for a number of bodily functions, including muscle activity, blood clotting, digestion, fertility, and cell division and growth. DHA is important for brain development and function. ALA is an “essential” fatty acid, meaning that people must obtain it from food or supplements because the human body cannot manufacture it.

Safety

- Omega-3 fatty acid supplements usually do not have negative side effects. When side effects do occur, they typically consist of minor gastrointestinal symptoms, such as belching, indigestion, or diarrhea.
- It is uncertain whether people with fish or shellfish allergies can safely consume fish oil supplements.
- Omega-3 supplements may extend bleeding time (the time it takes for a cut to stop bleeding). People who take drugs that affect bleeding time, such as anticoagulants (“blood thinners”) or nonsteroidal anti-inflammatory drugs (NSAIDs), should discuss the use of omega-3 fatty acid supplements with a health care provider.
- Fish liver oils, such as cod liver oil, are not the same as fish oil. Fish liver oils contain vitamins A and D as well as omega-3 fatty acids. Both of these vitamins can be toxic in large doses. The amounts of vitamins in fish liver oil supplements vary from one product to another.
- There is conflicting evidence about whether omega-3 fatty acids of the types found in seafood and fish oil might increase the risk of prostate cancer. Additional research on the association of omega-3 consumption and prostate cancer risk is under way.

Use of Omega-3 Supplements in the United States

According to the 2007 National Health Interview Survey, which included a comprehensive survey on the use of complementary health approaches by Americans, fish oil/omega-3/DHA supplements are the nonvitamin/nonmineral natural product most commonly taken by adults, and the second most commonly taken by children. Among survey participants who had used selected natural products in the last 30 days, about 37 percent of adults (10.9 million) and 31 percent of children (441,000) had taken an omega-3 supplement for health reasons.

What the Science Says

Moderate evidence has emerged about the health benefits of eating seafood. The health benefits of omega-3 dietary supplements are unclear.

Cardiovascular Disease

Evidence suggests that seafood rich in omega-3 fatty acids should be included in a heart-healthy diet. However, omega-3s in supplement form have not been shown to protect against heart disease.

- Epidemiological studies done more than 30 years ago noted relatively low death rates due to cardiovascular disease in Eskimo populations with high seafood consumption. Since then, much research has been done on seafood and heart disease. The results provide moderate evidence that people who eat seafood at least once a week are less likely to die of heart disease than those who rarely or never eat seafood.
- The Federal Government's *Dietary Guidelines for Americans, 2010* includes a new recommendation that adults eat 8 or more ounces of a variety of seafood (fish or shellfish) per week because it provides a range of nutrients, including omega-3 fatty acids. (Smaller amounts are recommended for young children.)
- Many studies have evaluated the effects of supplements rich in EPA and DHA, such as fish oil, on heart disease risk. In these studies, researchers compared the number of cardiovascular events (such as heart attacks or strokes) or the number of deaths in people who were given the supplements with those in people who were given inactive substances (placebos) or standard care. Most of these studies involved people who already had evidence of heart disease. A smaller number of studies included people with no history of heart disease. The results of individual studies were inconsistent; some indicated that the supplements were protective, but others did not. In 2012, two groups of scientists conducted meta-analyses of these studies; one group analyzed only studies in people with a history of heart disease, and the other group analyzed studies in people both with and without a history of heart disease. Neither meta-analysis found convincing evidence of a protective effect.
- There are several reasons why supplements that contain EPA and DHA may not help to prevent heart disease even though a diet rich in seafood may. Eating seafood a few times a week might provide enough of these omega-3s to protect the heart; more may not be better. Some of the benefits of seafood may result from people eating it in place of less healthful foods. There is also evidence that people who eat seafood have generally healthier lifestyles, and these other lifestyle characteristics may be responsible for the lower incidence of cardiovascular disease.

About Scientific Evidence on Complementary Health Approaches

Scientific evidence on complementary health approaches includes results from laboratory research as well as clinical trials (studies in people). It provides information on whether an approach is helpful and safe. Scientific journals publish study results, as well as review articles that evaluate the evidence as it accumulates; fact sheets from the National Center for Complementary and Alternative Medicine (NCCAM)—like this one—base information about research findings primarily on the most rigorous review articles, known as systematic reviews and meta-analyses.

Rheumatoid Arthritis

A 2012 systematic review concluded that the types of omega-3s found in seafood and fish oil may be modestly helpful in relieving symptoms of rheumatoid arthritis. In the studies included in the review, many of the participants reported that when they were taking fish oil they had briefer morning stiffness, less joint swelling and pain, and less need for anti-inflammatory drugs to control their symptoms.

Infant Development

The nutritional value of seafood is particularly important during early development. The Dietary Guidelines recommend that women who are pregnant or breastfeeding consume at least 8 ounces but no more than 12 ounces of seafood each week and not eat certain types of seafood that are high in mercury—a toxin that can harm the nervous system of a fetus or young child.

For the full recommendations on seafood consumption for women who are pregnant or breastfeeding, see the Dietary Guidelines at <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm> or MyPlate.gov at <http://www.choosemyplate.gov/pregnancy-breastfeeding/eating-fish.html>.

Diseases of the Brain and the Eye

DHA plays important roles in the functioning of the brain and the eye. Research is being conducted on DHA and other omega-3 fatty acids and diseases of the brain and eye, but there is not enough evidence to draw conclusions about the effectiveness of omega-3s for these conditions.

Research is looking at:

- Diseases of the brain or nervous system, such as cognitive decline and multiple sclerosis.
- Mental and behavioral health problems, such as depression, attention-deficit hyperactivity disorder, autism, bipolar disorder, borderline personality disorder, and schizophrenia.
- Diseases of the eye, such as age-related macular degeneration (AMD; an eye disease that can cause vision loss in older people) and dry eye syndrome. Studies have shown that people who eat diets rich in seafood are less likely to develop the advanced stage of AMD. However, a large National Institutes of Health (NIH)-sponsored study, called Age-Related Eye Disease Study 2 (AREDS2), indicated that supplements containing EPA and DHA did not slow the progression of AMD in people who were at high risk of developing the advanced stage of this disease.

Other Conditions

Omega-3 supplements (primarily fish oil supplements) also have been studied for preventing or treating a variety of other conditions such as allergies, asthma, cachexia (severe weight loss) associated with advanced cancer, Crohn's disease, cystic fibrosis, diabetes, kidney disease, lupus, menstrual cramps, obesity, osteoporosis, and ulcerative colitis, as well as organ transplantation

outcomes (e.g., decreasing the likelihood of rejection). No conclusions can be drawn about whether omega-3s are helpful for these conditions based on currently available evidence.

If You Are Considering Omega-3 Supplements

- Do not use omega-3 supplements to replace conventional care or to postpone seeing a health care provider about a health problem.
- Consult your health care provider before using omega-3 supplements. If you are pregnant, trying to become pregnant, or breastfeeding; if you take medicine that affects blood clotting; if you are allergic to fish or shellfish; or if you are considering giving a child an omega-3 supplement, it is especially important to consult your (or your child's) health care provider.
- Look for published research studies on omega-3 supplements for the health condition that interests you. Information on evidence-based studies is available from NCCAM at nccam.nih.gov/health/omega3.
- Tell all your health care providers about any complementary health approaches you use. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care. For tips about talking with your health care providers about complementary health approaches, see NCCAM's Time to Talk campaign at nccam.nih.gov/timetotalk.

NCCAM-Funded Research

Recent NCCAM-sponsored studies have been investigating the effects of omega-3s/fish oil on conditions including:

- Adolescent depression
- Autism spectrum disorders
- Brain injury
- Complications of HIV infection, including bone loss
- Depression during pregnancy and postpartum depression
- Treatment-resistant epilepsy.

Other NIH research includes studies on the effects of omega-3s/fish oil on many different conditions, including:

- Autoimmune diseases
- Alzheimer's disease
- Diabetic kidney disease
- Pregnancy outcome, including infant health and development
- Sudden cardiac death.

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For More Information

NCCAM Clearinghouse

The NCCAM Clearinghouse provides information on NCCAM and complementary health approaches including publications and searches of Federal databases of scientific and medical literature. The Clearinghouse does not provide medical advice, treatment recommendations, or referrals to practitioners.

Toll-free in the U.S.: 1-888-644-6226

TTY (for deaf and hard-of-hearing callers): 1-866-464-3615

Web site: nccam.nih.gov

E-mail: info@nccam.nih.gov

Office of Dietary Supplements (ODS), NIH

ODS seeks to strengthen knowledge and understanding of dietary supplements by evaluating scientific information, supporting research, sharing research results, and educating the public. Its resources include online publications (such as *Dietary Supplements: What You Need to Know*), fact sheets on a variety of specific supplement ingredients and products (such as vitamin D and multivitamin/mineral supplements), and the PubMed® Dietary Supplement Subset.

Web site: www.ods.od.nih.gov

Information on omega-3 fatty acids: ods.od.nih.gov/factsheets/omega3fattyacidsandhealth.asp

E-mail: ods@nih.gov

Agency for Healthcare Research and Quality (AHRQ)

AHRQ's mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. Information from AHRQ's research helps people make more informed decisions and improve the quality of health care services.

Web site: www.ahrq.gov

PubMed

A service of the National Library of Medicine (NLM), PubMed contains publication information and (in most cases) brief summaries of articles from scientific and medical journals.

Web site: www.ncbi.nlm.nih.gov/pubmed

NIH Clinical Research Trials and You

NIH has created a Web site, NIH Clinical Research Trials and You, to help people learn about clinical trials, why they matter, and how to participate. The site includes questions and answers about clinical trials, guidance on how to find clinical trials through ClinicalTrials.gov and other resources, and stories about the personal experiences of clinical trial participants. Clinical trials are necessary to find better ways to prevent, diagnose, and treat diseases.

Web site: www.nih.gov/health/clinicaltrials/

Research Portfolio Online Reporting Tools Expenditures & Results (RePORTER)

RePORTER is a database of information on federally funded scientific and medical research projects being conducted at research institutions.

Web site: projectreporter.nih.gov/reporter.cfm

MedlinePlus

To provide resources that help answer health questions, MedlinePlus (a service of NLM) brings together authoritative information from NIH as well as other Government agencies and health-related organizations.

Web site: www.medlineplus.gov

Information on dietary fats (including omega-3s): www.nlm.nih.gov/medlineplus/dietaryfats.html

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