

# backgrounder

## Omega-3 Supplements: An Introduction

Omega-3 fatty acids are a group of polyunsaturated fatty acids that are important for a number of functions in the body. They are found in foods such as fatty fish and vegetable oils and are also available as dietary supplements. People take omega-3 supplements to improve their health and prevent various diseases. This fact sheet provides a general overview of omega-3 fatty acids—with a focus on dietary supplements—and suggests sources for additional information.

### Key Points

- Omega-3 fatty acids are polyunsaturated fats found in foods and are also available as dietary supplements. Omega-3s are the natural product (defined as nonvitamin/nonmineral supplements) most commonly used by adults in the United States.
- Omega-3 fatty acids are being studied for a wide variety of diseases and conditions. Studies show that fish oil supplements are effective in reducing several cardiovascular disease risk factors and may help with some aspects of rheumatoid arthritis. Evidence for the health effects of omega-3s for other conditions is limited, and more research is needed.
- Additional research, including studies supported by the National Center for Complementary and Alternative Medicine (NCCAM) and other components of the National Institutes of Health (NIH), is under way.
- Omega-3s appear to be safe for most adults at low-to-moderate doses. However, fish oil supplements may cause minor gastrointestinal upset and at high doses can interact with certain medications, including blood thinners and drugs used for high blood pressure.
- Tell your health care providers about any complementary and alternative practices 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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NCCAM

## About Omega-3 Fatty Acids

Omega-3 fatty acids—also known as n-3 polyunsaturated fatty acids (PUFAs)—are important for a number of bodily functions, including the relaxation and contraction of muscles, blood clotting, digestion, fertility, cell division, growth, and movement of calcium and other substances in and out of cells.

The three major types of omega-3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). ALA is found in seeds, vegetable oils (canola, flaxseed, and soybean), green leafy vegetables, nuts, and beans. ALA is converted, usually in small amounts, into EPA and DHA, after it is ingested. Fish oil and fatty fish such as salmon, mackerel, herring, and tuna are the primary sources of EPA and DHA. Algae oils are a vegetarian source of DHA. Omega-3s are available as dietary supplements, usually in the form of capsules or oils. Commonly used supplements include fish oil, flaxseed oil, and walnut oil.

Most American diets provide at least 10 times more omega-6 than omega-3 fatty acids. Scientists generally agree that people should consume less omega-6s and more omega-3s for good health; however, the best ratio of omega-6s to omega-3s has not been determined.

## Use of Omega-3 Supplements in the United States

A 2007 survey by the National Center for Health Statistics and NCCAM on Americans' use of complementary and alternative medicine (CAM) found that omega-3 supplements were the most commonly used nonvitamin/nonmineral natural product taken by adults, and the second most commonly taken by children. Among survey participants who had used natural products in the last 30 days, about 37 percent of adults and 31 percent of children had taken an omega-3 supplement for health reasons.

## Status of Research on Omega-3s

Epidemiological studies done more than 30 years ago noted relatively low death rates due to cardiovascular disease in Eskimo populations with high fish consumption. Since these early studies, numerous observational and clinical trials have studied fish oil and omega-3 fatty acids for a wide variety of diseases and conditions. Overall, the evidence appears the most promising for improving cardiovascular disease risk factors. For example, studies show that increasing levels of DHA and EPA—either by eating fish or taking fish oil supplements—lowers triglycerides, slightly lowers blood pressure, may slow the progression of atherosclerosis (hardening of arteries), and may reduce the risk of heart attack, stroke, and death among people with cardiovascular disease.

Several small studies have also found that fish oil may benefit people who have rheumatoid arthritis (RA). High doses of fish oil significantly reduced RA patients' morning stiffness, number of swollen joints, and need for corticosteroid drugs.

The American Heart Association has issued DHA and EPA intake recommendations for adults, including amounts for people with coronary heart disease and those with high triglyceride levels.

Additionally, omega-3s have been studied for conditions such as asthma, dementia, diabetes, inflammatory bowel disease, lupus, osteoporosis, and renal disease, as well as organ transplantation outcomes (e.g., decreasing the likelihood of rejection). However, more research is needed before conclusions can be drawn about these conditions.

## **Side Effects and Risks**

- Omega-3s appear to be safe for most adults at low-to-moderate doses. The FDA has concluded that omega-3 dietary supplements from fish are “generally recognized as safe.”
- Some have questioned the safety of fish oil supplements because some species of fish can contain high levels of mercury, pesticides, or polychlorinated biphenyls (PCBs). However, fish oil supplements do not appear to contain these substances.
- Fish oil supplements may cause minor gastrointestinal upsets, including diarrhea, heartburn, indigestion, and abdominal bloating.
- In high doses, fish oil can interact with certain medications, including blood thinners and drugs used for high blood pressure.

## **If You Are Thinking About Using Omega-3 Supplements**

- Do not use omega-3 supplements as a replacement for conventional care or as a reason to postpone seeing a doctor about a medical problem, such as a serious cardiovascular condition.
- Consult your health care provider before deciding to use omega-3 supplements. If you are pregnant or nursing a child, or if you are considering giving a child a dietary supplement, it is especially important to consult your health care provider. Supplements can act like drugs, and many have not been tested in pregnant women, nursing mothers, or children.
- 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/](http://nccam.nih.gov/health/omega3/) and from the NIH Office of Dietary Supplements at [ods.od.nih.gov/factsheets/omega3fattyacidsandhealth.asp](http://ods.od.nih.gov/factsheets/omega3fattyacidsandhealth.asp).
- Tell your health care providers about any complementary and alternative practices 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 CAM, see NCCAM’s Time to Talk campaign at [nccam.nih.gov/timetotalk/](http://nccam.nih.gov/timetotalk/).

## **NCCAM-Funded Research**

Recent NCCAM-sponsored studies have been investigating the effects of omega-3 fatty acids/fish oil on:

- Autism in children and adolescents
- Bipolar disorder
- Cardiovascular disease
- HIV-infected patients with hypertriglyceridemia (excess triglycerides in the blood)

- Major depression in adults, adolescent depression, and depression in people with multiple sclerosis
- Stress, immune function, and mood in medical students.

Other NIH research includes studies on the effects of omega-3 fatty acids/fish oil on:

- Perinatal depression
- Moderate-to-severe asthma
- Alzheimer's disease
- Chronic obstructive pulmonary disease
- Heart disease risk and psychological health (e.g., mood, impulsivity, and anger levels)
- Prostate cancer
- Ductal carcinoma in situ (DCIS, a type of breast cancer) and atypical ductal hyperplasia (a noncancerous condition in the breast).

## Selected References

### Agency for Healthcare Research and Quality

The following listings are from the Evidence Report/Technology Assessment series of the Agency for Healthcare Research and Quality (AHRQ) in Rockville, Maryland.

*Effects of Omega-3 Fatty Acids on Lipids and Glycemic Control in Type II Diabetes and the Metabolic Syndrome and on Inflammatory Bowel Disease, Rheumatoid Arthritis, Renal Disease, Systemic Lupus Erythematosus, and Osteoporosis.* Evidence Report/Technology Assessment no. 89. 2004. AHRQ publication no. 04-E012-1.

*Health Effects of Omega-3 Fatty Acids on Asthma.* Evidence Report/Technology Assessment no. 91. 2004. AHRQ Publication Number 04-E013-1.

*Effects of Omega-3 Fatty Acids on Cardiovascular Disease Risk Factors and Intermediate Markers of Cardiovascular Disease.* Evidence Report/Technology Assessment no. 93. 2004. AHRQ publication no. 04-E010-1.

*Effects of Omega-3 Fatty Acids on Cardiovascular Disease.* Evidence Report/Technology Assessment no. 94. 2004. AHRQ publication no. 04-E009-1.

*Effects of Omega-3 Fatty Acids on Cognitive Function with Aging, Dementia, and Neurological Diseases.* Evidence Report/Technology Assessment no. 114. 2005. AHRQ publication no. 05-E011-1.

*Effects of Omega-3 Fatty Acids on Organ Transplantation.* Evidence Report/Technology Assessment no. 115. 2005. AHRQ publication no. 05-E012-2.

*Effects of Omega-3 Fatty Acids on Mental Health.* Evidence Report/Technology Assessment no. 116. 2005. AHRQ publication no. 05-E022-2.

*Effects of Omega-3 Fatty Acids on Eye Health.* Evidence Report/Technology Assessment no. 117. 2005. AHRQ Publication Number 05-E008-2.

*Effects of Omega-3 Fatty Acids on Child and Maternal Health.* Evidence Report/Technology Assessment no. 118. 2005. AHRQ publication no. 05-E025-2.

### Other References

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Oh R. Practical applications of fish oil (omega-3 fatty acids) in primary care. *Journal of the American Board of Family Practice.* 2005;18(1):28-36.

Omega-3 fatty acids, fish oil, alpha-linolenic acid. Natural Standard Database Web site. Accessed at <http://www.naturalstandard.com> on September 15, 2008.

Riediger ND, Othman RA, Suh M, et al. A systemic review of the roles of n-3 fatty acids in health and disease. *Journal of the American Dietetic Association.* 2009;109(4):668-679.

## **For More Information**

### **NCCAM Clearinghouse**

The NCCAM Clearinghouse provides information on CAM and NCCAM, 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](http://nccam.nih.gov)

E-mail: [info@nccam.nih.gov](mailto:info@nccam.nih.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. CAM on PubMed, developed jointly by NCCAM and NLM, is a subset of the PubMed system and focuses on the topic of CAM.

Web site: [www.ncbi.nlm.nih.gov/sites/entrez](http://www.ncbi.nlm.nih.gov/sites/entrez)

CAM on PubMed: [nccam.nih.gov/research/camonpubmed/](http://nccam.nih.gov/research/camonpubmed/)

### **ClinicalTrials.gov**

ClinicalTrials.gov is a database of information on federally and privately supported clinical trials (research studies in people) for a wide range of diseases and conditions. It is sponsored by the National Institutes of Health and the U.S. Food and Drug Administration.

Web site: [www.clinicaltrials.gov](http://www.clinicaltrials.gov)

### **Research Portfolio Online Reporting Tool (RePORT)**

RePORT 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](http://projectreporter.nih.gov/reporter.cfm)

### **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 publications and the International Bibliographic Information on Dietary Supplements database.

Web site: [www.ods.od.nih.gov](http://www.ods.od.nih.gov)

E-mail: [ods@nih.gov](mailto:ods@nih.gov)

## **National Library of Medicine's MedlinePlus, NIH**

To provide resources that help answer health questions, MedlinePlus brings together authoritative information from the National Institutes of Health as well as other Government agencies and health-related organizations.

Web site: [www.medlineplus.gov](http://www.medlineplus.gov)

## **Agency for Healthcare Research and Quality (AHRQ), HHS**

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](http://www.ahrq.gov)

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