



Omega 3 Fatty Acid *n-3 polyunsaturated fatty acid (PUFA)*

Common Indications:

- Inflammatory conditions, including arthritis
- Cardiovascular protection
- High triglycerides
- Neuroprotection, including ADHD, depression and other neurological disturbances
- Skin conditions
- Weight loss

General Comments:

Fish oils are composed of the essential fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).^{1,2} EPA and DHA come from the polyunsaturated fatty acid (PUFA), alpha-linolenic acid (ALA) and are classified as omega-3 fatty acids. The human body can convert a very small amount of alpha linolenic acid into EPA & DHA but not in adequate amounts to be healthy, thus EPA & DHA are “essential” fatty acids and must be consumed in the diet or by supplement to reach healthy levels.

The classic American diet is high in Omega 6 fatty acids and very low in Omega 3 acids, leading to an average 30:1 ratio of omega 6:omega3. A healthy ratio is closer to 1:1 to 3:1. This excess in Omega 6 leads to an inflammatory chemistry that contributes to risk for diabetes, diabetes, cardiovascular disease, neurological disturbances, asthma, allergies, joint pain and arthritis. Omega 3 fatty acids have an anti-inflammatory impact by suppressing inflammatory cytokines such as IL-1, IL-6 and TNFalpha.

Fish oil has been reported beneficial in improving lipid profiles and decreasing inflammation, leading to lower risk of developing cardiovascular disease and diabetes. Omega 3 fatty acids also improve immune function and neurological function.

Benefits & Mechanism of Action:

Inflammatory conditions, including arthritis

Omega-3 fatty acids help decrease inflammatory signaling and the metabolic consequences of chronic inflammation, including metabolic syndrome, cancer, heart disease, allergies/asthma, ulcerations, type 2 diabetes and insulin resistance.^{3,4,5,6,7,8,9} They also help to reduce the pain of rheumatoid arthritis in adults.^{10,11}

Cardiovascular protection

Omega-3 fatty acids help maintain/support cardiovascular health. They help to reduce blood pressure to within normal limits and reduce atherosclerosis.^{12,13,14,15,16,17}

High triglycerides

Omega-3 fatty acids help to reduce serum triglycerides/triacylglycerols.^{18,19,20}

Neuroprotection, including ADHD, depression and other neurological disturbances

Omega-3 fatty acids help support the development of the brain, eyes and nerves in children and adolescents.^{21,22,23,24} They have neuroprotective properties and help support neurological function, including cognition, depression and those with ADHD.^{25,26,27,28,29,30}

Skin conditions

Omega-3 fatty acids help improve skin conditions like eczema/psoriasis.

Weight loss

Helps improve weight loss through inhibition of key enzymes responsible for lipid synthesis, such as fatty acid synthase and stearoyl-CoA desaturase-1, enhancement of lipid oxidation and thermogenesis, and prevention of free fatty acids from entering adipocytes for lipogenesis. PUFAs also exert suppressive effects on several key factors involved in adipocyte differentiation and fat storage.^{31,32}

Dose: 1,000 to 2,000 mg daily.

- 3 to 4 grams of EPA + DHA are recommended for treatment of cardiovascular issues
- Up to 8 gm may be used in aggressive therapies such as cancer or cognitive improvement.

Patients should purchase quality fish oil supplements that are treated/filtered for heavy metal contaminants, such as mercury and lead as well as dioxins and PCB's

Symptoms of Depletion:

Deficiency is primarily due to a lack of dietary intake and the fact that omega-3 has been almost totally removed from most processed foods. Symptoms of omega-3 fatty acid deficiency include a wide variety of imbalances related to organ, endocrine, and immune function, leading to insulin resistance, obesity, inflammation, type 2 diabetes, cardiovascular disease and cancer.

Conditions that leave a patient with an increased need for omega 3 fatty acids include:

- Diets high in omega-6 fatty acids may lead to imbalances in body's natural omega-6:omega-3 fatty acid profile

- Diets high in trans-fatty acids also deplete omega-3 fatty acids from the body, leading to fatty acid imbalances.

Food and supplements that may decrease omega-3 fatty acids include:

- Olestra - a non-fat, calorie-free cooking oil that inhibits absorption of fat-soluble nutrients

Cautions & Side Effects: There is no known toxicity when using fish oil (omega-3 fatty acids) as a dietary supplement.³³

Medication interactions

Medications with increased effects while taking omega-3 fatty acids include:

- Anticoagulant medications

Medications that can decrease the amount of omega-3 fatty acids include:

- Mineral oil
- Orlistat and the OTC product, Alii
- The bile acid sequestrants colestipol and cholestyramine

Although some of the fish that contain omega-3 fatty acids also contain low levels of mercury, the Food and Drug Administration has reported that consuming several servings of fish each week poses no risk to healthy people and conveys many health benefits. Women who are pregnant or planning to become pregnant should avoid Atlantic mackerel, shark, swordfish, and tilefish, and should limit consumption of white albacore tuna to under 6 oz. per week.

Food Sources:

Fish oil is found in cold-water fishes, such as halibut, mackerel, salmon, striped bass, rainbow trout, tuna, and sardines. Omega-3 fatty acids are also found in marine algae, hemp, walnuts, flaxseed oil and purslane (*Portulaca oleracea*).

Nutrient Interactions:

Niacin

Certain nutrients are required for proper function of delta-6 desaturase enzyme activity, which converts omega-3 fatty acids to EPA and DHA. The nutrients include niacin, pyridoxine, ascorbic acid, and zinc. Thus, a deficiency of any of these nutrients could impair the biosynthesis of EPA and DHA.

Pyridoxine

Certain nutrients are required for proper function of delta-6 desaturase enzyme activity, which converts omega-3 fatty acids to EPA and DHA. The nutrients include niacin, pyridoxine, ascorbic acid, and zinc. Thus, a deficiency of any of these nutrients could impair the biosynthesis of EPA and DHA.

Ascorbic acid

Certain nutrients are required for proper function of delta-6 desaturase enzyme activity, which converts omega-3 fatty acids to EPA and DHA. The nutrients include niacin, pyridoxine, ascorbic acid, and zinc. Thus, a deficiency of any of these nutrients could impair the biosynthesis of EPA and DHA.

Zinc

Certain nutrients are required for proper function of delta-6 desaturase enzyme activity, which converts omega-3 fatty acids to EPA and DHA. The nutrients include niacin, pyridoxine, ascorbic acid, and zinc. Thus, a deficiency of any of these nutrients could impair the biosynthesis of EPA and DHA.

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General Comments

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Inflammatory conditions, including arthritis

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Cardiovascular protection

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High triglycerides

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Neuroprotection, including ADHD, depression and other neurological disturbances

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Weight loss

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Cautions & Side Effects

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