



# The Science behind Fish Oil Supplements



Omega-3 fatty acids, one of two major classes of polyunsaturated fatty acids (PUFAs), are considered essential because the body cannot synthesize them. Extensive research has been done on Omega-3s, especially the types found in seafood and fish oil supplements, the EPA and DHA.

Another type of Omega-3, Alpha-linolenic acid (ALA), derived from plants must undergo conversion first to EPA and then to DHA before it can be available to other bodily processes. EPA metabolism produces certain anti-inflammatory eicosanoids that help protect against inflammatory diseases, heart attack, and stroke. It shares a metabolic pathway with arachidonic acid, an omega-6 fatty acid that generally produces eicosanoids involved in inflammatory responses. DHA is the omega-3 fatty acid critical for brain development and proper function. It's thought to play a role in signal transmission along neurons and in anti-inflammatory actions within the brain.

Research has shown that dietary consumption of more omega-3 fatty acids than omega-6 fatty acids tends to support overall health. Most Americans, however, consume at least 10 times more omega-6 fatty acids than omega-3 fatty acids, indicating a need for nutrition education and intervention.

Fish oil supplements rich in EPA and DHA may help individuals overcome these barriers and meet omega-3 fatty acid requirements. Several studies have been conducted over the past few decades investigating the effect of fish oil supplementation on numerous conditions including childhood allergies, dementia, CVD, and post-resistance exercise muscle soreness.

## Childhood Allergies

There are many studies investigating the effect of prenatal omega-3 fatty acid supplementation on eczema, rhino-conjunctivitis, asthma, and sensitization in subjects' offspring. One study reported a reduction in eczema severity, and pooled results showed a decreased incidence of atopic eczema at age 12 months. Another study found a reduction in "sensitization to egg" and "sensitization to any food" at 12 months. A randomized, controlled trial following the offspring of mothers for 24 years from 1990 investigated the effects of supplementation on the risk of asthma and allergic respiratory disease. The researchers

found that members of the fish oil group had a significantly reduced probability of having had asthma medication prescribed; indicating that maternal fish oil supplementation may play a role in asthma prevention.

## Dementia Prevention

In a 2016 study, cognitively healthy participants aged 50–75 took 2,200 mg per day of omega-3 fatty acids for 26 weeks. These individuals recalled object locations significantly better than their counterparts in the placebo group. The results of this study support the hypothesis that omega-3 fatty acid supplementation could help maintain memory function in healthy older adults. These results suggest a need for further research with consistent intervention methods and longer follow-up to provide insight for future recommendations.

## Cardiovascular disease (CVD)

Fish oil supplementation has been shown to help lower serum triglyceride levels in people with hypertriglyceridemia, a known risk factor for various cardiovascular complications. Omega-3 PUFAs' role in heart remodeling and recovery after a heart attack also has been a topic of interest for researchers. A recently published randomized trial provided evidence that 4 g daily of omega-3 fatty acids from fish oil for six months after an acute myocardial infarction resulted in significant improvements in left ventricular end-systolic volume and non-infarct myocardial fibrosis.

## Post-exercise Muscle Soreness and Inflammation

One repeated measures intervention trial tested exercise-induced inflammation markers after a 14-day control trial in which participants followed a low-omega-3 diet and performed an eccentric biceps curl exercise with one arm. For the experimental trial, participants consumed 2 g EPA and 1 g DHA per day for seven days while following the same omega-3 restricted diet. They then performed the biceps curl with the arm opposite to that used in the control trial. Inflammation markers were tested 48 hours after exercise in both trials. The results showed a significant decrease in muscle soreness in the experimental trial and a significant increase in eccentric exercise repetitions completed in set one and two by the experimental group.

Another randomized, double-blind, placebo-controlled study tested healthy 20 to 60-year-old women on the effect of 3 g per day of DHA on post-exercise muscle soreness, swelling, stiffness, skin temperature, and salivary C-reactive protein. The women consumed the supplements for seven days before, the day of, and two days after the assigned strength exercise. The DHA supplementation group had 23% lower muscle soreness ratings than did the placebo group, and significantly more women in the DHA group could perform a full elbow extension two days after the maximal-effort eccentric biceps curl exercise. These findings support previous research demonstrating a beneficial effect of fish oil supplementation on post-exercise markers in groups of men and women.