

Fish Oil

WHAT IS EPA?

Eicosapentaenoic acid (EPA) is a long-chain Omega-3 polyunsaturated "essential fatty acid" found in fish. Omega-3s are "essential" because humans are unable to synthesize them, and therefore they must be obtained through our diet.

EPA, Eicosanoids, and Inflammation

Beyond their cardio protective effects, Omega-3s (especially EPA) are believed to be beneficial for many autoimmune and inflammatory disorders, including arthritis, asthma, inflammatory bowel disease, systemic lupus erythematosus, and psoriasis.

Heart Health

Fish oil is an excellent source of both EPA and docosahexaenoic acid (DHA), another long-chain Omega-3, and appears to be beneficial for cardiovascular health by reducing the risk of cardiac arrest and ischemic stroke. In fact, the evidence is so strong that the American Heart Association has stated that *"people who have elevated triglycerides may need two to four grams of EPA and DHA per day provided as a supplement"*, and the White House has urged the Department of Health and Human Services to revise the nation's dietary guidelines *"to include new information that Omega-3 fatty acids may reduce the risk of heart disease"*.

Psychotherapeutic Action

Epidemiological and tissue compositional studies have linked low seafood intake to major depression, postpartum depression, and schizophrenia, as well as to the severity of depressive symptoms. Although the clinical study of Omega-3s for the use in psychotherapy has only just begun, a few studies have shown that EPA improved symptoms in both schizophrenia and depression, and increased remission time in bipolar disorder

WHAT IS DHA?

Docosahexaenoic acid (DHA) is a long-chain polyunsaturated Omega-3 essential fatty acid from fish. Omega-3 fatty acids are "essential" because humans are unable to synthesize them, meaning that they must be obtained through our diet. The brain in particular is very rich in DHA, where it increases membrane fluidity, promotes neurite (axonal and dendritic) outgrowth, and supports functions such as learning, memory, and cognitive development.

Protection Against Stress

One of the apparent benefits of DHA is to protect against the harmful effects of stress. Supplementation with DHA has been shown to reduce elevations in aggression and hostility in response to psychological stress, and may have contributed to a reduction in antisocial behaviors among prisoners given dietary supplements. In addition, DHA may help to protect against the increased risk of heart attack associated with stress and depression.

Learning and Cognition

In clinical trials, low levels of DHA in the body and low fish consumption have been established as risk factors for age-associated cognitive impairments, especially Alzheimer's Disease. One study even found that Omega-3 treatment improved Alzheimer's Disease-induced cognitive impairments for six months.

Pregnancy and Lactation

During pregnancy and lactation, proper nutrition with long chain Omega-3s appears to be especially important for the health of both the mother and child. Inadequate maternal Omega-3 intake during pregnancy is a risk factor for premature birth and low birth weight, diabetes, and postpartum depression. DHA also appears to be very important to infants' visual and cognitive development. A recent study showed that children whose mothers had taken cod liver oil during pregnancy and lactation had higher IQ's at age four than those whose mothers had taken a placebo. However, it is also important to note that exposure to environmental toxins found in certain kinds of fish, are associated with increased risk for low birth weight. It is therefore crucial for expecting mothers to seek out a molecularly distilled source of Omega-3 polyunsaturated fatty acids.

WHAT IS GLA?

In general, Western diets contain too few Omega-3 essential fatty acids and too many Omega-6 essential fatty acids (found in sunflower oil, safflower oil, corn oil, and other foods), an imbalance that may predispose many towards hyper-inflammation. The one exception may be gamma-linolenic acid (GLA), a different type of Omega-6 fatty acid. GLA is concentrated in borage oil and evening primrose oil, and has anti-inflammatory effects through mechanisms similar to those used by EPA. So it is not surprising that studies using GLA have shown that it may be useful in the treatment of arthritis, premenstrual syndrome and breast pain, inflammatory bowel disease, skin disorders such as eczema, and other conditions. However, GLA can also metabolize into the pro-inflammatory Omega-6 fat arachidonic acid. Thankfully, taking EPA in conjunction with GLA appears to inhibit this process, potentially making the total effect of the two greater than the sum of its parts.

WHEN DIET IS NOT ENOUGH

For most people, taking EPA and DHA may be the most effective way to achieve proper EFA balance. Foods traditionally thought to be good sources of EFAs may not supply adequate amounts of EPA and DHA, and may contain harmful heavy metals. Much of the salmon on the market today is farmed and fed a grain diet instead of fish meal. As a result, the fish can be abnormally high in linoleic acid and pesticides, and low in Omega-3 fatty acids. In addition to insufficient Omega-3 rich foods in the American diet, many factors can lead to a reduced absorption of EFAs including:

- Low Levels of key vitamins and minerals
- Alcohol consumption
- Some prescription drugs
- A diet high in hydrogenated trans fats
- Age
- Compromised immune status
- Poor diet

OMEGA-3 FROM FISH OR FLAX?

Omega-3 fatty acids fall into two major categories: plant derived (flaxseed, yielding alpha linoleic acid or ALA) or marine derived (fish oil, yielding both EPA and DHA) the human conversion of ALA to EPA and DHA is somewhat slow and can be inhibited by various conditions. Research shows that only about 5% of ALA converts to EPA, and it may not convert to DHA at all.

Lifestyle and health influences that can inhibit the conversion include a diet high in linoleic acid (Omega-6), saturated and trans fatty acids, as well as alcohol intake. A deficiency of any of the vitamin and mineral cofactors (vitamin B3, B6, C, zinc and magnesium) required by elongase and delta-6-desaturase, may inhibit conversion of ALA to EPA and DHA, as well as certain health conditions, such as diabetes and immune weakness.

The majority of research conducted on Omega-3 fatty acids has been done with fish oil, and has focused on the benefits of EPA or DHA. **On a gram for gram basis, fish oils are the optimal means of enhancing EPA and DHA in the body.**