

Omega-3 Fatty Acids: Health Benefits Galore

What are omega-3 fatty acids?

Fish such as tuna, salmon, rainbow trout, sardines, Atlantic mackerel, and herring are rich in fat and have fatty acids – the main component of fat – not found in any other foods. These fatty acids are missing many hydrogen atoms so they are highly polyunsaturated, more so than other polyunsaturated fatty acids in food. They are also longer than most other fatty acids. These structural differences give fish oil fatty acids their unique health properties. They are called “omega-3” fatty acids because of the location of the first two missing hydrogens. The two main omega-3 fatty acids in fish oils are called EPA and DHA for short. EPA and DHA occur naturally only in seafood, and are abundant only in fatty fish and marine animals.

Why are omega-3 fatty acids healthful?

Once they are consumed, omega-3 fatty acids are avidly taken up by different tissues and incorporated mainly into cell membranes. There, they affect the metabolic activities carried out in the cells, sometimes restraining activity, other times facilitating certain functions. For example, these long-chain omega-3 fatty acids are incorporated into the retina of the eye where they affect visual function. In brain, they affect neurodevelopment and function. In the heart, they influence electrical activity so that abnormal heart rhythms are discouraged. No other fatty acids have been shown to have such effects. Our understanding of omega-3 metabolism is advancing rapidly and revealing an enormous array of functions influenced by these fatty acids.

Are all omega-3 fatty acids the same?

No. Fish contain mainly EPA and DHA omega-3s. Some plants and seeds contain another omega-3 fatty acid, alpha-linolenic acid or ALA. This is the omega-3 found in walnuts, flax seed and oil, canola oil and to a lesser extent, soybean oil. ALA is shorter, has fewer missing hydrogens, and behaves differently in the body from EPA and DHA. Most ALA is oxidized or “burned” before it can affect metabolic activity.

ALA is healthful and has been favorably linked to heart health. However, it does not have all the functions of EPA and DHA, particularly in maternal and infant nutrition. For neurodevelopment and other activities, ALA needs to be converted to EPA and DHA. Humans can perform this conversion, but they do so very inefficiently. In adults, the conversion to DHA may be less than 5 percent. Under the best circumstances, consuming large amounts of ALA yields only small amounts of EPA and DHA. The easiest and most effective way to obtain the health benefits of omega-3s is to get them already preformed – in Pacific troll-caught albacore and other fatty fish.

* EPA: eicosapentaenoic acid; DHA: docosahexaenoic acid

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