OMEGA-3S

ARE FISH AND PLANT OMEGA-3S THE SAME?

Food labels and news stories mention omega-3s often—usually referring to the heart-healthy oils in fish. They are widely discussed because of the many health benefits associated with them. Omega-3s are a type of polyunsaturated fatty acid the body needs, but cannot make for itself. For that reason we need to obtain them from foods.

There are three main omega-3 fatty acids. One, alpha-linolenic acid, is found in some plant seeds and oils such as flax. The other two are EPA* and DHA*, and these occur almost exclusively in fish and shellfish. EPA and DHA are known as "long-chain" omega-3s because their structure is longer than alpha-linolenic acid. The body has a strong preference for the long-chain omega-3s.

You may hear that you can get the same health benefits associated with eating fish from plant foods, such as flax seed. However, alpha-linolenic acid in plants does not have all the same properties as the omega-3s from fish. Does the difference matter? It may, depending on your needs.

Fish Oil Omega-3s

EPA and DHA have special functions in the body. DHA is highly concentrated in the brain, where it helps brain cells communicate with each other and protects them from harmful substances, such as those in Alzheimer's disease. It is concentrated in the retina of the eye, where it is critical for visual function. EPA is important for healthy blood vessels, heart health, and brain function. It also has anti-inflammatory and anti-clotting properties that favor a healthy heart and brain.

Plant Omega-3s

Alpha-linolenic acid is the only omega-3 found in plants. It has some, but not all, the health benefits associated with EPA and DHA. Most of it is oxidized or "burned" for energy. A very small amount, less than 5%, is converted to EPA. Only a trace amount of this EPA is further converted to DHA.

It is our limited ability to convert alpha-linolenic acid to EPA and almost no DHA that creates a dilemma. The body needs DHA for brain structure and function and for the retina of the eye. When DHA is not sufficiently available, substitutes made from other fatty acids do not function as well. This is of key importance for pregnant women who must supply DHA to the developing fetus. If they do not obtain DHA from the foods they eat, the fetus draws DHA from the mother's tissues. Over several pregnancies, this process depletes the mother's supply.

DHA is important in the retina for optimum visual acuity, the ability to see clearly. Once depleted, the retina may not recover fully, even if plenty of DHA is provided later. Retinal DHA also participates in the cellular communication processes that eventually result in the ability to see. The retina has the highest concentration of DHA in the body, an indication of its importance.

DHA is also important in protecting brain health. Recent research has shown that DHA is the basis for making a substance called neuroprotectin D1, which reduces the production of the harmful protein responsible for Alzheimer's disease. Neuroprotectin D1 protects brain cells against other damaging cellular by-products, prolongs the life of brain cells, and reduces inflammation, processes that occur early in the development of Alzheimer's disease. It is also a key substance in the communication between brain cells.

The Body's Preference for Fish over Plant Omega-3s

When consumed in ready-made form, EPA and DHA from fish oils are taken up into tissues immediately. They are not used for energy. This means they are ready to go to work for us stabilizing heart rhythms, keeping over-active inflammatory responses in check, improving blood flow, and participating in brain function. In pregnancy and early infancy, the fetus and young infant readily incorporates DHA into its growing brain and developing visual system, whereas plant-based alpha-linolenic acid is of limited use because so little is converted to DHA.

Fish intake in most western countries, including the U.S., is very low, but consumption of vegetable oils rich in linoleic acid, another type of polyunsaturated fatty acid, is high. Americans consume at least 10 times as much linoleic acid as alpha-linolenic acid. High levels of linoleic acid further reduce the conversion of alpha-linolenic acid to EPA. Other polyunsaturates, including flax and fish oils, also reduce the amount converted. Thus, taking flax oil to boost omega-3 intake is likely to reduce the amount converted to EPA rather than boost it.

In its favor, plant omega-3s help offset the large amounts of linoleic acid in western diets. It also has some positive effects on heart health and immune function. However, the health effects of fish oil omega-3s appear to be stronger, quicker-acting, and more diverse.

Foods Rich in Omega-3s

EPA and DHA are found almost exclusively in fish and shellfish. They are most abundant in fatty fish such as salmon, rainbow trout, black cod (sablefish), sardines, mackerel, herring and pilchards. All seafoods have some EPA and DHA. Egg yolks from hens fed flaxseed have alpha-linolenic acid, EPA and DHA, because the chicken is better able to convert alpha-linolenic acid to EPA and DHA than we are. Eggs with omega-3s are usually marked as containing "omega-3s." Small amounts of EPA and DHA are in poultry too.

Plant-based sources of alpha-linolenic acid are flax seed and oil, walnuts, canola and soybean oils.

New products such as yogurt, margarine, spreads and snack bars may have omega-3s added, but may not indicate which ones they have. Such foods nearly always have alpha-linolenic acid from flax seed or oil. Unless the label specifically mentions "long-chain" omega-3s, or EPA, or DHA, it will not have fish oil omega-3s. Be sure to read the label.

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* EPA or eicosapentaenoic acid; DHA or docosahexaenoic acid

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