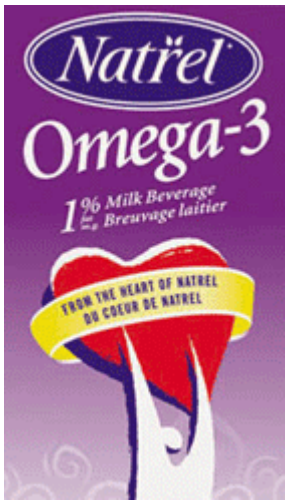
Beware the Omega-3 Bait-and-Switch
Media reports and food makers obscure vital differences between omega-3s from plants and fish
By Randy Hartnell and Craig Weatherby, Vital Choices Newsletter, August 22,2005



Over the past year, we've seen many reports on food manufacturers' efforts to meet consumer demand for foods fortified with omega-3 fatty acids. Rising consumer demand is driven by a steady stream of positive research findings—as reported in past issues of Vital Choices—results that confirm and expand the proven preventive health benefits of dietary omega-3s.

Unfortunately, many food manufacturers engage in a bait-and-switch tactic that exploits consumers' understandable confusion regarding the distinctions between types of omega-3s.

The labels on many food packages now proclaim, proudly, that the product is rich in omega-3s. However, most of these products are not fortified with the long-chain omega-3s found only in fish and other seafood, which are the only kind proven to confer preventive health benefits regarding the brain, heart, and overall health. (The terms "long-chain" and "short-chain" refer to the number of carbon atoms in the omega-3 molecules in seafood and plants, respectively.)

Instead, most manufacturers fortify their foods with short-chain, plant-derived omega-3s. These substitutes, though better than nothing, are not proven to confer the strong health benefits associated with long-chain "marine" omega-3s. And, while the body can convert them to long-chain omega-3s, the amounts produced are very small.

Food manufacturers engage in this seedy (pardon the pun) nutritional switch for two reasons:

1. It is very difficult to eliminate or mask the fishy flavor that inevitably accompanies marine-source omega-3s, which are obtained from fish oils. This flavor barrier makes them unsuitable as food additives.
2. Plant source omega-3s are generally cheaper than fish-derived omega-3s.

Why does this distinction make a difference? Bear with us for a simple (we promise) explanation of the differences between plant- and fish-derived omega-3s.

Essential fatty acids
Essential fatty acids (EFAs) are omega-3 and omega-6 polyunsaturated fats that cannot be made by the body but are needed for normal growth and metabolism. To survive, humans only need to get one to two percent of their total calories in the form of EFAs, but it's becoming increasingly clear that people need more than the bare minimum to enjoy optimal health and reduce the risk of heart disease and cancer.

A clear scientific consensus holds that the average American diet is much too high in omega-6 EFAs, relative to omega-3s, primarily because Americans eat so much processed food, which often contains vegetable oils (safflower, sunflower, corn, soy, canola) high in omega-6 linoleic acid (LA). Some of these oils—notably soy and canola—contain small amounts of omega-3 alpha-linolenic acid (ALA), but the overall picture is one of a serious imbalance in favor of omega-6s.

Omega-3s: the inflammation connection
While omega-6 fats are essential to life and health, excess dietary intake promotes "silent," non-symptomatic inflammation, which in turn promotes aging, arteriosclerosis, heart attacks, diabetes, obesity, and certain cancers, exacerbates arthritis, and undermines health over time.

Why is an excess of omega-6 EFAs pro-inflammatory? Omega-3 and omega-6 EFAs are the building blocks for ephemeral messenger chemicals called prostaglandins that regulate many bodily functions, including cellular responses, immune function, and hormone synthesis.

Series 1 and 3 prostaglandins (PGE-1 and PGE-3) are anti-inflammatory, while Series 2 prostaglandins (PGE-2) are pro-inflammatory, which is one reason why the ratio of dietary omega-3s to omega-6s is so important:

- The body makes pro-inflammatory PGE-2 from omega-6 essential fatty acids.
- The body makes anti-inflammatory PGE-3 from omega-3 essential fatty acids.

Another anti-inflammatory prostaglandin, PGE-1, is made from the internally produced omega-6 fatty acid called gamma linoleic acid (GLA). However, the body usually has no difficulty making enough GLA, given the overabundance of omega-6 linoleic acid in the average American's diet.

Omega-3s: direct effects on brain and overall health
Both types of EFAs—omega-3s and omega-6s—are essential to maintaining cell membrane fluidity and stability, the development and function of brain and nerve tissue, oxygen transfer, and energy production.

Studies show that DHA, the long-chain omega-3 in fish oil, and an omega-6 called arachidonic acid (AA) are both critical to proper development in children, and can help children and adolescents with attention deficit and behavioral disorders. Both of these fatty acids are abundant in human breast milk and both are added to infant formulas.

The omega-3 difference: plant sources versus seafood sources

The results of hundreds of studies confirm that alpha linolenic acid—the omega-3 found in plant foods—does not exert the beneficial effects produced by the longer chain omega-3s (EPA and DHA) found in fish oils.

This is because the body can only construct prostaglandins, cell membranes and other key physiological factors from the long-chain omega-3s (EPA and DHA) found in fish oils. For the short-chain omega-3s in plant foods to be of use, the body has to convert them into EPA and DHA.

But this conversion process is highly inefficient. In fact, it is now believed that the body converts no more than 10 percent of short-chain, plant-source omega-3 (ALA) to usable long-chain omega-3s (EPA and DHA). And, almost all of the ALA in plant oils gets converted to EPA, while little or none changes into DHA, which is at least as important for heart, brain, and eye health.

Even the plant oils richest in omega-3s—flax, hemp, and walnut—are relatively poor "sources" of EPA and DHA. Please note that flaxseed (not flax oil) is an unsurpassed source of anti-cancer compounds called lignans —specifically, enterlactone and SDG—which may reduce risk of breast cancers.

To quote from a review article by EFA researchers, "…many human studies have shown that alpha-linolenic acid [plant omega-3] supplementation produces only modest increases in EPA … and no increase in DHA. A recent study reported that DHA in breast milk did not increase with alpha-linolenic acid supplementation. In contrast, it is well known that DHA supplementation increases plasma and breast milk DHA."

Lifestyle and health factors can further hinder the conversion of plant-source omega-3s to usable long-chain omega-3s (EPA and DHA). These include:

- Diets high in Omega-6, trans, and saturated fatty acids
- High alcohol intake
- Deficiency of vitamins B3, B6, C, or zinc and magnesium (needed for conversion of plant omega-3s to EPA and DHA)
- Diabetes
- Immune dysfunction

Beware the bait-and-switch
Next time you cruise the supermarket aisles and "omega-3" appears on a label, look more closely. It's probably a

case of nutritional bait-and-switch, and you'd be getting plant-source omega-3s instead of the far more valuable long-chain marine omega-3s.

"High-omega-3" eggs are one exception to this rule … but remember that the fish added to the laying hens' feed may well be menhaden; an over-fished, ecologically vital species (see "Fish Overkill" article).

Just pass the omega-3 impostors and keep going until you reach the fish case. Better yet, reach for your mouse and secure superior wild seafood and supplemental Salmon Oil rich in marine omega-3s.

Study underscores unhealthful effects of omega-3/omega-6 imbalances

Like most things in life, it is possible to get too much of a good thing: a point highlighted by the findings of a recent UK study. The British investigation seems to support a connection between very high fish consumption and low omega-6 food intake with increased risk of the less common of two types of stroke.

Given the overwhelming evidence that Americans consume too many omega-6s and not enough omega-3s, and that people who eat more fish enjoy a lower stroke risk, this is a hypothetical issue rather than a practical problem.

Last week, researchers at the University of Bristol in Britain released the surprising results of a study that looked at links between childhood diet and risk of stroke late in life. They examined diet surveys collected during a study known as Boyd Orr that was carried out across 16 centers in England and Scotland between 1937 and 1939.

Family members were followed up using the register of the UK's National Health Service, to reveal any correlation between childhood diets and the risk of death from coronary heart disease or stroke.

The researchers looked at consumption of fruit, vegetables, fish, oily fish, total fat, saturated fat, carotene, vitamin C and vitamin E by 4,028 children aged between birth and age 19, estimating intake from total household dietary intake.

Surprising findings
As expected, higher intake of vegetables was associated with lower risk of stroke. But they also found an unexpected correlation between higher intake of fish and higher risk of stroke in later life. This was surprising because the current scientific consensus says that eating more fish reduces stroke risks.

In fact, the UK researchers conceded that their analysis is subject to error in four ways:

- The survey collected household rather than individual food intake information, and researchers analyzing it were forced to assume that children in each pre-War home ate the same foods, in the same ratios, as did the adults in the home.
- People are notoriously inaccurate in their responses to such surveys, so researchers require a very large sample size to reduce error. In contrast to the very large populations (70-300,000) surveyed for similar studies (e.g., the famous Physicians' and Nurses' diet-health studies), this investigation had to rely on data collected from only a few thousand households.
- The unexpected number of diet-disease associations found may mean the observations were due to chance.

Uncommon omega-6 shortage seen as underlying risk factor

Other investigations that have found links between high omega-3 intake and increased stroke risk indicate that problem is inadequate intake of omega-6s in relation to omega-3 intake, rather than excess fish intake per se.

For example, the results of a study published in 2001 suggest that high fish intake accompanied by low intake of omega-6 EFAs may reduce the concentrations of arachidonic acid in cell membranes, thereby raising the risk of hemorrhagic strokes, the more dangerous type, which constitutes 20 percent of all strokes. (Arachidonic acid is an omega-6 fatty acid essential to cell membrane function.)

While the vast majority of Americans consume too little omega-3 fat and too much omega-6 fat, some world populations experience a somewhat elevated risk of a relatively uncommon kind of stroke because their diets are heavily imbalanced in favor of omega-3-rich seafood.

It is important to note that many of the fish oils on the market today are concentrated, containing unnaturally elevated levels of EPA and DHA. The implication is that 'more is better,' however it would seem that, when it comes to fish oil, one should favor balance over potency. While concentrated oils may have their place in therapeutic applications, for health conscious individuals who avoid excessive consumption of omega-6-rich foods (e.g., common vegetable oils other than olive), these high dose fish oils may be unnecessary or even detrimental.

Based on the overwhelming evidence that eating ample amounts of fish—e.g., two to three servings per week—reduces the risk of heart attack and stroke, the UK government's Food Standards Agency recommends that Britons eat at least two portions of fish a week, one of which should be oily fish such as salmon, sardines, or sablefish.

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