

FISH-OIL UPDATE

My friend James has worked two jobs ever since he brought his wife and kids with him five years ago from the island of Jamaica. The tropical farm overlooking the Caribbean Sea, where he grew up, has been in his family for generations. The man is blessed with a buoyant nature that even the long hours of work and culture shock of life in an Oakland ghetto haven't dimmed. I thought his smile had begun to look a little tight, though, after a painful arthritis set in last year from a leg injury. Many months later, I was glad to see he was his snappy self again. A friend had recommended fish-oil capsules. He told me the stuff really works, and I told him I wasn't at all surprised.

Like most islanders, James was brought up on fish and shellfish. [Speculation: Could this be a factor in his enviable well-being? When a pregnant lady eats seafoods, the polyunsaturated omega-3 fats they supply make a beeline for the intricate circuits in the baby's developing brain. We need them the rest of our lives, for the same reason.] The way I figure it, life in a northern California city, for a Jamaican, means not just cultural but *climatic* upheaval. Oakland can be a breezy 50 degrees in August. The cooler the climate, the more omega-3s people require. The kinds of fats and oils we consume determine the lipid composition of our cells, i.e., we transform highly unsaturated omega-3s from diet into highly flexible cell and tissue components. In that sense, we ARE what we eat. Omega-3 fats allow us to limber up ligaments and muscles, speed up blood flow, and de-creak joints.

Oakland is on San Francisco Bay, but fresh fish and shellfish are expensive. James needs more omega-3s here than he did in Jamaica, and gets less. Working long hours, he tends to grab stuff at fast-food places where fats abound but not the omega-3 kind. Fish-oil capsules are making it possible for James to offset some of the junk fats with good ones, allowing his arthritic joints to heal.

The other day he said he was puzzled: A friend told him fish oils were banned because they were dangerous. You may have read the news stories, too, in July, and wondered.

In 1988, the U.S. Food & Drug Administration (FDA) sent regulatory letters to U.S. pharmaceutical firms that make fish-oil supplements, forbidding them from making specific health claims in ads and labels for these oils. The recent brouhaha began when the FDA's Daniel Michels sent letters dated June 28, 1990, to these firms, warning them that health claims for fish-oil supplements would cause their products to be considered "drugs," and ordering them to discontinue marketing them within 14 days.

The companies were puzzled and alarmed. Most of them *had* been abiding by the original 1988 FDA edict. When they talked to FDA staffers, they were told the agency would act only against companies and products that violated the prohibitions spelled out in 1988. Daniel Michels then sent a letter dated July 16 to the Council for Responsible Nutrition (CRN), an organization of supplement manufacturers,

explaining that his June 28 letter applied only to supplement makers *who were making health claims for fish-oil products*. The agency would *not* pursue "regulatory sanctions against marine lipid products...., provided these articles are not labeled or intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease" (CRN News, Vol. 9, No. 13, July 1990).

Now comes the fishy part, excuse the pun. On the same day, July 16, FDA's press office chose to release to newspapers and wire services Daniel Michels' June 28th 'ultimatum' to supplement makers. The ensuing newspaper and tv stories, logically enough, implied there was a total ban on fish-oil supplements. The FDA had determined them to be worthless, they said, and possibly harmful.

Since then, in answer to inquiries (mine, for example), the FDA Office of Consumer Affairs sent out a statement saying their only aim is to make sure no health claims are made by makers of fish-oil products. Not a word in the bulletin about banning them! Meanwhile, the public has been left with the impression that all fish-oil supplements are contraband.

For instance, in Oakland, *THE TRIBUNE's* science columnist Peter Aleshire wrote on July 21: "...fish-oil pills don't work and may contain dangerous, unwanted contaminants, concluded the FDA in issuing an order to halt the sale of all fish-oil pills touted as a cure for heart disease." Aleshire approves, pointing out that while no one is disputing the value of fish, "especially those high in Omega 3 fatty acids, like mackerel, anchovies, herring, Atlantic salmon, sardines, Atlantic sturgeon and tuna (preferably albacore packed in spring water)," he thinks popping pills is a lousy substitute for the real thing. [What fish-lover can argue with that?] He then writes: "...study after study has found little or no health benefit from fish-oil pills themselves. In fact, it is easy to overdose on fish-oil pills, which could cause internal bleeding. Doctors advise pregnant women to avoid fish-oil pills altogether for that reason."



"It all started when I found out my wife was cooking with margarine instead of butter."

Holy Toledo! The thousands of misguided physicians from the turn of the century until the 1940s, who told all pregnant women to take cod liver oil and give it faithfully to their infants and children, were killing us and we didn't know it!

Let alone the millions of people who still eat sardines that're canned in fish oil. That's been going on around the world for about a century.

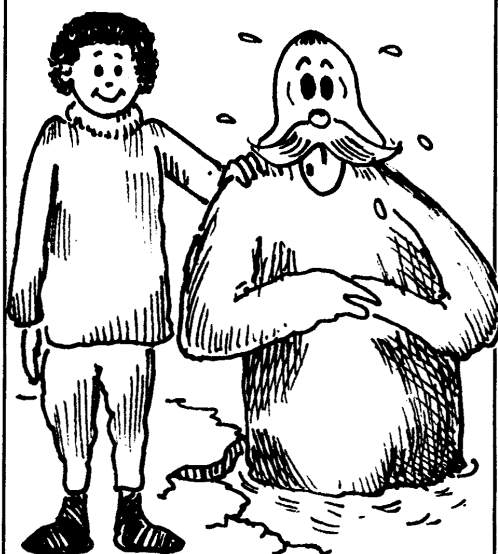
Just a little digging would enable Aleshire or the FDA to find out where the fish oil in capsules comes from. Yup, it originates from the same fish-oil industries that process and separate oily "waste" fish such as menhaden into fish meal and oil--about 22.5 million metric tons a year worldwide, including the U.S. The meal is sold for animal feed and other products. The oil is: (1) Used as fuel. (2) Canned with fish, especially sardines. Not in the U.S, but commonly in Norway and other countries. (3) Made into margarine and shortening for the European and British market.

The rest of it, a relatively tiny amount, goes to pharmaceutical firms who make "marine lipid products." All fish oil sold for human intake undergoes considerable refinement and purification, similar to procedures for vegetable oils. Pharmaceutical firms may refine it further to bring it up to specific standards.

Safety? How can the trifling amount of fish oils consumed as supplements be compared with the millions of metric tons hardened into margarine, or canned with sardines and other fish?



What about the safety of cod liver oil, with its high omega-3 content, which has been a drug store item for about a hundred years?



I'd like to call the FDA's and Peter Aleshire's attention to a major review in the July 1990 *American Journal of Clinical Nutrition*, a conservative medical journal. John E. Kinsella, Belur Lokesh, and Richard A. Stone from Cornell University's Institute of Food Science summarize and evaluate a mountain of current research on the effects of dietary omega-3s on the cardiovascular system. There are 418--count 'em!--references. Even I was impressed by the rapid accumulation of new studies. They indicate grant monies are pouring in to fund the medical exploration of what may be the most promising weapon yet against heart disease.

First of all, how safe are fish-oil supplements? Kinsella et al. say "increased consumption of fish oils may require supplementation with tocopherol to minimize in vivo peroxidation." In other words, the more polyunsaturated fats and oils we take in, the more vitamin E we need to protect the tissues they become a part of. If the diet doesn't provide enough, supplemental vitamin E may be a wise measure. Also, they suggest vitamin E (tocopherol) be added to fish-oil supplements.

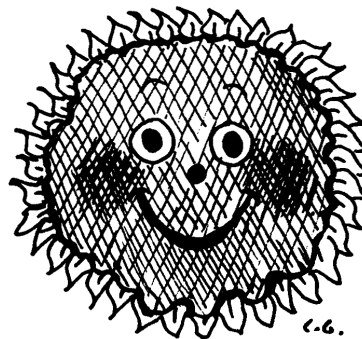
Secondly, an increased intake of fish-liver oils "may pose a hazard because of their high content of vitamins A and D." This, of course, refers to oil from the livers of cod or halibut, which in addition to its high omega-3 content, provides large amounts of

the two vitamins since they're stored in the liver. Oil from the *body* of fish, on the other hand, which is used in most supplements, has very little A or D. The reviewers also suggest reducing cholesterol concentration in fish-oil supplements--something many manufacturers currently are doing--and, of course, making sure oils are treated to eliminate pesticide residues or rancidity, which is a concern for all makers of oil-based food products.

What about the scary business of "internal bleeding"? Greenland's native Eskimos, whose freedom from heart disease on their monumentally high blubber diet sparked the great interest in omega-3s, take nearly twice as long to form a clot as do people on a conventional diet, but *no way* do they routinely suffer from internal bleeding! A longer clotting time (so long as it's not carried to extremes) reduces chances for heart attack or stroke because clots that form too readily can plug up crucial arteries.

Kinsella et al. say: "The increased tendency of subjects ingesting high amounts of fish oil to suffer from bruising and prolonged bleeding is of concern, particularly in the event of accidents. However, *there have been no reports of any bleeding problems during trials with fish-oil supplementation. The increased bleeding times are less than those caused by aspirin.*" [Emphasis mine.]

Since these medical trials number in the hundreds, I think that is a comforting summarization. *Nowhere in the review is there a warning against prescribing fish oils for pregnant women because of "bleeding" problems.* *



*Indeed, many health professionals are becoming sensitive to the need for adequate w3 PUFA in the mother's diet, since recent studies showed that prenatal deficiencies produced permanent vision problems in infant monkeys, and less than optimal brain development in young rats. Fish-oil supplements can be useful as 'insurance' in the diet, so long as safe amounts are consumed. In much the same way, years ago pregnant women in the U.S. took a teaspoon of cod liver oil a few times a week

On the matter of "dangerous, unwanted contaminants," Kinsella's review skims over this "problem," perhaps because fish oils used in research are above reproach, having been purified to high standards. As to supplements sold to the public, the processing of all fish oils intended for human intake, as I mentioned, is as complex as that for vegetable oils, involving filtering, winterizing, degumming, neutralizing, bleaching, deodorizing, etc.

Jeffrey Fisher, M.D. writes in answer to the question of whether fish-oil supplements contain toxic heavy metals and organic impurities: "...Reliable manufacturers screen for and remove these substances. Can one say the same for fish?" (n-3 NEWS: *Unsaturated Fatty Acids & Health*, Vol.3, No. 1, March 1988).

While the FDA implies that fish-oil supplements don't work, the July 1990 review says they work very well indeed! Some medical studies had the subjects eating mackerel or other fatty fish, but most focus on intake of the oils themselves, the object being to isolate the effects of EPA and DHA which are the pivotal omega-3 polyunsaturated fatty acids in fish oils. For brevity, I'll use the term "w3 PUFA". Here are some of the findings:

(a) In general, consumption of w3 PUFA is associated with a reduced incidence of coronary arterial diseases.

(b) The Japanese people have a *sixfold lower incidence* of atherosclerosis and heart disease than do Americans. Japanese farmers and fishermen eat a year-round average of *90 to 250 grams of fish, or 3 to 9 ounces, a day. We Americans average only about ten pounds of fish a year--less than half an ounce a day.* (Time for a change, yes?)

(c) The w3 PUFA lower the amount of fats (triglycerides) in the blood, and do so far better than w6 vegetable oils in the diet can. [The only two families of fats that are essential, i.e., must be gotten from the diet, are the omega-3 and omega-6.]

(d) Fish oils in the diet change the blood picture much for the better. For example, they reduce levels of an omega-6 fat, *arachidonic acid* (w6 AA). High levels of w6 AA in blood platelets are associated with abnormally high amounts of *thromboxane*, which causes platelets to clump together (aggregate) and stick to arterial linings. Less thromboxane means less chance of angina, heart attack, or stroke.

(e) The w3 PUFA from fish oils slow down synthesis from w6 AA of a slew of other troublemakers. One group, the *leukotrienes*, provoke inflammation in tissues, cause arteries to squeeze down (also bronchial tubes, as in asthma), and force platelets to glom onto arterial walls---unless there's enough w3 PUFA in the diet to stop them.

(f) Why, you may ask, does the body go to the bother of making substances from w6 AA that wreak havoc? Actually, all of them play necessary roles such as mobilizing white cells to fight infections, or initiating clotting to keep us from bleeding to death. Moreover, w6 AA makes a benign substance, *prostacyclin*, that opposes thromboxane by preventing platelets from sticking to blood vessel linings except to plug up a cut vessel.

Scientists were concerned dietary w3 PUFA could interfere with these normal defenses. To date, except for slightly longer bleeding time, as noted, the w3 PUFA have checked out just fine! They reduce leukotriene, thromboxane, etc. to inoffensive levels, but don't decrease prostacyclin much at all. *Moreover, w3 PUFA in our tissues make their own prostacyclin which, together with w6 AA prostacyclin, keeps clots from sticking to linings of blood vessels, except for necessary repair work.*

(g) We usually derive w6 AA in our tissues from two main sources: meat and eggs, which contain small amounts of preformed AA; and fats and oils from seeds, grains, and nuts containing *w6 linoleic acid* (w6 LA). Our own bodily enzymes can convert w6 LA to w6 AA.

The reviewers make this telling point: The widespread advocacy for increased consumption of vegetable oils and margarines rich in LA but low in omega-3s (e.g., corn, safflower, cottonseed) may be resulting in too much w6 AA in our tissues, leading to excessive, imbalanced amounts of thromboxanes and leukotrienes.

(h) By virtue of their high degree of polyunsaturation, w3 PUFA are able to impart extra elasticity to blood components. This causes blood to be less sludgy, and red corpuscles more "deformable," i.e., better able to maneuver through tiny vessels. *The w3 PUFA thus actually increase blood flow in peripheral capillaries, bringing more oxygen to tissues.*

(i) The inner lining of blood vessels can produce a substance called *growth factor*. By stimulating unhealthy growth and migration of cells, it's thought to be a major contributor to the fateful buildup of plaque

and narrowing of arteries that we call *atherosclerosis*. Fish oils have been shown to inhibit the release of growth factor.

(j) By stimulating blood vessels to produce *endothelial-derived relaxing factor*, fish oils counteract harmful spasms in arteries.



Summing up the evidence, the Cornell scientists say that adequate w3 PUFA in the diet have the potential of *preventing atherosclerosis*. In addition, by putting the brakes on blood components that are the culprits in *excess clot formation, excess sticking of platelets to arterial linings, and excess squeezing down (spasms) of blood vessels*, the w3 PUFA may eliminate the major precipitators of heart attacks and strokes!

Kinsella, Lokesh and Stone say there's still a lot to learn. In diabetic patients, for example, fish oil brought disappointing results in some trials, but very promising benefits in others. In general, the question of safe and effective intakes for different therapeutic needs still requires much work. They say: "*Consumption of seafoods as a regular dietary practice would appear to be prudent for prophylactic effects, whereas, for therapeutic purposes, ingestion of fish oil enriched with w3 PUFA on a frequent basis may be beneficial.*"

In other words, the amounts needed to deal with cardiovascular disease may be much greater than can be met with a fish diet alone. It's not unusual for 10 grams of w3 PUFA daily from fish oils to be used in studies with heart patients. *Remember, this review is by doctors, written for doctors, and not to be interpreted as a guide for self-treatment of serious illness.*

On the other hand, if you're healthy and planning to stay that way, i.e., "prophylactic" usage, the reviewers say a consistent intake of 2 to 3 grams a day of w3 PUFA may be effective.

Fishwise, that translates to about 3 to 4 ounces of mackerel or herring, or about 8 ounces of salmon, albacore tuna, or lake trout.

A personal "prophylactic" favorite is a sandwich piled high with tomatoes, sprouts, and Norway sardines, plus a teaspoon of sild oil from the can, smeared on my bread. That gives me about 2 grams EPA + DHA.

Clearly, there are many folks (vegetarians, allergic persons, fish-haters, people without cooking facilities, etc.) for whom none of the above is possible or palatable! Kinsella et al. say fish-oil supplements may be a practical alternative in these instances. Personally, I use them as extra insurance, say, when my fish intake is low, when winter winds start to blow, or when I feel any arthritic twinges. (The omega-3s do a whole lot more than fight heart disease—my friend James can tell you that—but that's another story!)

Fish oil capsules vary in w3 PUFA content, usually listed as milligrams of EPA + DHA. [Yes, they're still available and "legal."] It's not hard to figure how many capsules add up to a 1 to 3 gram range, if that's your goal, remembering that 1000 mg = 1 gram.

An interesting discovery: The review says emulsified fish oil given to human subjects enhanced the absorption of w3 PUFA many times that of non-emulsified oil. I've bought emulsified fish oils in healthfood stores. They're easy to give to babies and older children (no gelatin capsules to swallow), not bad tasting, and don't produce 'fishy' burps!

Another logical way to get your w3 PUFA is by the roundabout vegetarian route. Omega-3 Alena (alpha-linolenic acid) from champion foods such as flaxmeal, flax oil, soybeans, tofu, soy oil, walnuts, canola oil, oat germ, and wheat germ, can be converted slowly in your system to EPA and DHA. Although in short-term trials, EPA and DHA from seafoods and fish oils are more effective than Alena in keeping down levels of thromboxane and the other 'bad apples,' Kinsella et al. say the high Alena foods "may be effective when consistently consumed in low-fat diets."

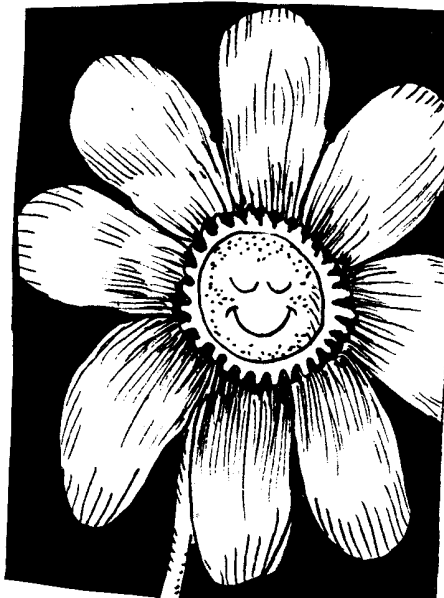
The reviewers say that common too-high intake of w6 LA fats and oils may have a number of undesirable effects, including

possible suppression of immune function. They say that eating less fat altogether, as well as consuming fewer dietary w6 PUFA, and more w3 PUFA, is more in keeping "with the diet of our primeval ancestors."

"Overall, in view of the prevalence of coronary heart disease, consumption of w3 PUFA oils should be considered as a useful complementary option for the amelioration of coronary vascular diseases."

Omega-3s and the heart: Are we talking about a medicine, or a food? Hard to tell where the border begins and ends, when a factor in food turns out to be superb medicine!

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SNIPPETS FROM READERS' LETTERS

"...I wish to relate to you how the article on Fortified Flax [in FL 43] helped my 11-year-old German Shepherd dog. She has been suffering from severe diarrhea and weakness in her legs....nothing seemed to help her...After reading the article, I thought if Fortified Flax [organic flaxmeal fortified with zinc and b6, sold in health stores] helped humans, horses, chicks, etc., why not my dog? ...To our amazement and joy, the diarrhea has stopped, her bowel movements are formed, her hair doesn't fall out as much and I even noticed she doesn't stumble as much, so it looks like her legs are getting stronger....Since the flax has performed such wonders on my dog, we are going to take it also.

"I have written to Mr. Stitt [Paul Stitt, who developed Fortified Flax, is a leading researcher in human and animal use of flaxseed] thanking him for keeping up the research and working towards the benefit of mankind and animals. He saved my dog from being put to sleep."

R.C., South Holland, IL, July 17, 1990.

In FL 52 & 53, I wrote about my late-life discovery of an old remedy, baking soda, updated by blending it with potassium bicarbonate and taken about an hour after meals, not for acid stomach but for restoring a more optimal pH in the rest of the gut. Lots of reader reaction, including this letter, dated June 5, 1990:

"...I'm eighty years old and have five grandchildren. On the whole my health is far above average and I do have many more 'good' days than uncomfortable ones.

"...I remember my father singing a little ditty, 'I eat when I'm hungry, I drink when I'm dry—and if the baking 'sodie' holds out, I'll live 'til I die.'

"It was all he ever took for flatulence. My spells send me out of commission for as long as five days and away from computer and the book I'm working on. Frustrating! I'd forgotten about Dad's baking 'sodie.' I started taking it after reading the last Felix letter and went a long time without a spell...."

S.H., Walnut Creek, CA.

Small wonder I think my readers are the greatest. ***



Illustrations are by Clay Geerdes and other artists as noted.

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