the FELIX Letter
A COMMENTARY ON NUTRITION
No. 45 1989

FISH OILS:
SHOULD WE TAKE THEM?

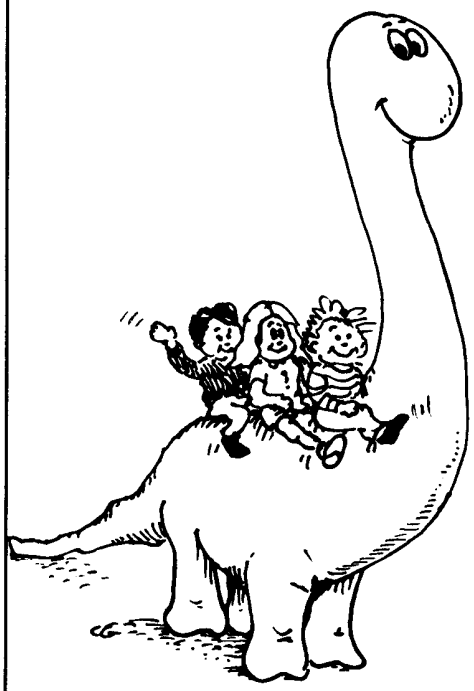
Are you old enough to remember the years when cod liver oil was being administered, benevolently if not always tenderly, to every tot in the family? In my childhood, no household rich or poor was without it. Some mothers were nice enough to stir each fishy-smelling dose into freshly squeezed orange juice (there was no frozen concentrate in the grocery stores yet); others, like mine, gave it to us straight. The sweetest of souls, still she knew when to get tough with small rebels. I'm glad now my brother and I fought a losing battle with her, every time!

Doctors were all for it. Long before vitamins were discovered, they had learned that oil from the livers of cod fish prevented the softening of bones--rickets--later found to be caused by lack of D, the "sunshine vitamin," with which cod liver oil was loaded.

"In 1824, cod liver oil, long used as a 'folk medicine,' was found to be important in the treatment of rickets (though it was not used universally for this purpose until nearly a century later). In 1918 Mellanby of London, in studies with puppies, provided the first experimental proof that rickets was a deficiency disease and he was able to cure it by feeding cod liver oil." (1)

Physicians in the early years prescribed cod liver oil also to prevent eye disease and night blindness, recognized years later to be vitamin A deficiency disorders. Cod liver oil is full of vitamin A, too, but no one knew it until the 1930's when scientists finally isolated both vitamin A and D and began to track down their complex actions in the body. By the time my own children were born, cod liver oil was being discarded in pediatric practice in the USA in favor of non-oily, non-fishy forms of the two vitamins. None of us, including the doctors, knew it at the time, but then and there we blew it!

A bit of respect for folk wisdom might have clued us in to the fact that there was more to the oil than its vitamin content. The 1990's may go down in biomedical history as the era of the omega-3 oils. Long ignored by scientists, these fats are proving to be big wheels in the governance of the human system. They were, of course, the unrecognized benefactors in cod liver oil. The drops of the oil for babies and teaspoonfuls given to toddlers were full of ultrapolyunsaturated omega-3 fatty acids known as EPA and DHA. A baby's tissues will soak them up like a sponge! The growing brain normally needs large amounts, and for a child to have good vision so does the retina of its eyes---but this knowledge is still pretty new and its nutritional connection not fully grasped in pediatric medicine.



The current interest in omega-3 fats focuses on their potential role in easing or preventing heart disease, the biggest cause of death in Western countries. About a decade ago, researchers stumbled on the information that Eskimo hunters and their families in icy northern Greenland, who practically lived on fish and seals full of omega-3 fats, were singularly free of 20th century-style heart disease. Unlike the arteries in Western populations, theirs weren't narrowed by plaque, nor closed down further by blood clots or spasms that can bring on a heart attack or stroke. It turns out their blood had five times more EPA and DHA than that of Swedes, Americans or Scots! Full of guarded excitement, the medical research community set up scores of experiments using fatty fish and fish oils as EPA and DHA sources. The results, so far: Diets high in fatty fish or supplements of fish oils show strong signs of protecting against heart attack and stroke!

We don't understand all the mechanisms by which the omega-3's accomplish this, but what we know is not only fascinating (well, at least to biochemistry mayvens), but explains why these fats added to the diet are doing very good things for other ailments. For one, by balancing the actions of the other family of essential fats, the omega-6, they tend to keep painful inflammatory reactions in check, leading to benefits in rheumatoid arthritis, for example, in migraine headache, and in inflammatory skin disorders such as psoriasis. Omega-3's help asthma patients to breathe freely again by keeping certain omega-6 metabolites from constricting the bronchial tubes.

Fortunately for us, they do the same for our coronary arteries!

As integral partners in a polyunsaturate-based regulatory system, whose existence was only conjectured by scientists 25 years ago, omega-3 and omega-6 fats together affect the workings of every cell, tissue and organ in our bodies. Researcher and physician Donald O. Rudin says one of the reasons for the epidemic of heart disease in the first place, is the dangerously low intake of omega-3 fats

in modern industrialized countries---which is why doctors are seeing such good results when they give them to patients. *

After Rudin put his patients experimentally on a high omega-3 supplement (usually linseed oil, sometimes fish oil), he saw "spectacular" results over a two-year period in ailments as varied as arthritis, dry cracked skin on fingers and heels, immune system disorders, migraine headaches, enlarged prostate, chronic cystitis, angina, and high blood pressure, and even in some severe mental cases. He concluded that his patients, many of them on "well-balanced" diets, had been suffering from an unsuspected nutritional deficiency disease, because although most of their disorders are viewed medically as separate disease entities, all responded to the same nutrient. (2)

While not willing to go as far as Rudin in saying many common diseases actually are manifestations of a "synergistic malnutrition disorder" centering around an omega-3 deficiency, researchers are expressing optimism about the effects of EPA and DHA on a number of conditions, ordinarily viewed as unrelated to each other. Formal medical studies so far show benefits in such diverse illnesses as psoriasis, migraine, diabetic retinopathy, pain and skin ulcer in circulatory disease of the legs, and rheumatoid arthritis. In animal experiments omega-3 fats can inhibit new cancers, slow their growth, and prevent them from metastasizing; they also help to reverse kidney disease.

On the alternative medicine grapevine, physicians say they're seeing the same kind of improvements over a broad spectrum that Rudin describes. Psychiatrists such as A. Hoffer, M.D., Ph.D., who pioneered the use of nutrient therapy in mental disorders, are reporting benefits in patients.

*** Omega-3's get trounced through industrial food modifications (hydrogenation of oils, steel roller milling of grains, commercial production/distribution of low omega-3 foods), plus a revolution in people's dietary habits, pulling them away from traditionally eaten good omega-3 sources (e.g., fish, game, poultry fats, walnuts) in favor of very poor ones (e.g., beef, Crisco, margarine, peanuts).**

Alexander Leaf, M.D. and Peter Weber, M.D., leading researchers in cardiovascular effects of omega-3's (3a), point out that the actions of fish oils

"...may be protective not only against atherosclerosis, but they may have beneficial effects on modulating the excessive or misdirected activity of the immune system as well, which we think is responsible for the so-called autoimmune diseases like lupus, rheumatoid arthritis, and, perhaps, even the aging process." **(3b)**

So where does that leave us, as health professionals or health conscious consumers? Fish is a good food, fish oils can be bought in drug stores, supermarkets and health stores, and even skeptical scientists agree there 'may be gold in them thar hills!'

. Do we go for broke and consume both?

. How much EPA and DHA should we be getting?

. Can we get too much?

. What are drawbacks or dangers?

First, the amounts. Excellent studies come from a medical group tracking health patterns related to fish intake over several years in a fishing village and a farming community in rural Japan (4a, 4b) . Both peoples have superior cardiovascular health, but the fishermen's is outstanding. Both have very low incidence of cerebrovascular strokes, the fishermen the lowest. The farmers average 3 ounces of fish a day. The fishmen eat as much as their catch allows, averaging about 8 ounces daily. (Farmers, about 70 lbs. a year; fishermen about 180 lbs. Compare this with 10-12 lbs. of fish eaten per person a year in the USA.)

Here's the omega connection: ***Farmers get 1.5 grams EPA + DHA a day. Fishermen get 4 grams.***

Incidentally, in Japan the fattiest fishes (e.g., mackerel) are valued the most. Unlike fat in beef which has undetectable amounts of EPA and DHA, fat in all fish and shell fish is high in these omega-3's, but some species have very little total fat. Fat fish like mackerel, salmon and herring are loaded with them.

Looking at this picture from the long view, we see that a diet shown to be safe for centuries (at least!) appears to provide good protection against heart attack and stroke, on an EPA + DHA intake of 1.5 to 4 grams a day. Logically, fish eaters can follow in these time-honored footsteps!

For those who'd rather go the supplement route, fish oils vary a lot, but plain arithmetic should make it easy for us to add up the EPA + DHA contents on labels to come up with a daily intake of 2 to 4 grams (remembering there are 1000 milligrams to a gram).

Cod liver oil, as we know by now, is a fine source but if we regularly take more than a teaspoon or so a day, over the long haul we may be getting more vitamins A and D than is good for us. When taking oils solely for omega-3 content, it's best to switch to oils from the body, rather than the liver, of fish, since all animals, fish, and humans store vitamins A and D in their liver. There's no danger of overdosing on these vitamins if we choose fish body oils.

What about taking EPA/DHA supplements in addition to a generous fatty fish diet?

The answers aren't in yet on how much omega-3 is too much. We know that excess omega-6 fat will suppress the metabolism of omega-3 fat, but the converse also is true, so caution and moderation are the key. Certain health conditions may warrant an experimental double-barreled approach, but under those circumstances an individual ought to be seeing a clinician, one, I hope, who looks with a kindly eye on nutritional therapies!

Not all do. Ellen Coleman, R.D., writes in the February 1988 magazine *Nutrition*:

Do the fish-oil supplements work? Are they safe? Are they worth your money? Should you take them? The answer to each of these questions is no, according to the American Heart Association, the American Medical Association and many experts studying fish oils.

While the hierarchy's 'experts' feel it's probably a good idea to eat fish, apparently their hackles rise at fish oil supplements, especially when self-administered. Forgotten are all the years their own mothers may have plied them with cod liver oil! [Note: If you've been in the nutrition game as long as I, you've heard the same chorus, with different verses, many times over: i.e., the 'dangers' of self-dosing with vitamin C, vitamin E, or for that matter, any supplement not prescribed by the doctor. Take it with a grain of salt and sort out the real from the mythical dangers. By their lights, the 25 to 50% of the American population buying over-the-counter vitamins and minerals would be in mortal peril, by now!]

HAZARDS IN FISH OILS: FACTS & FANCIES

Because omega-3's increase the time it takes for blood to clot (a plus when you're trying to avoid forming thrombi in arteries), the big scare tactic used by supplement skeptics is that fish oils will cause you to bleed to death. Certainly, individuals with known bleeding disorders or on blood-thinning drugs shouldn't fool around with self-dosing. Sensibly, Drs. Leaf and Weber write:

***There have been no reports of bleeding during clinical trials of fish-oil supplements. The increase in bleeding time is similar to or smaller than that produced by the ingestion of aspirin, and a preliminary report indicates that the combination of n-3 [omega-3] fatty acids and aspirin results in little if any increase above that produced by aspirin alone.* (3a)**

Jeffrey Fisher, M.D. writes: "As long as one stays within the 2-3 gram range, and isn't on medications which prolong bleeding time, I can imagine no contraindications to supplements." (5)

A reasonable objection cited by some researchers is the possibility of heavy metal contaminants and pesticides present in fish oils. A major supplier of these oils replies:

***Credible fish oil concentrates now on the market are guaranteed free from toxic metals, bacterial toxins, chemical residues, pollution by-products, allergens, and manufacture is controlled as would be a pharmaceutical entity.* * * (6)**

ANTI-OXIDANT PROTECTION

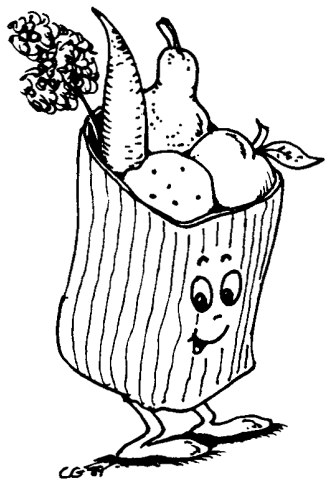
The other concern brought up by thoughtful scientists is that as we fill up our tissues with ultrapolyunsaturated omega-3's, the potential for lipid peroxidation increases. The resulting free oxygen radicals may damage tissues or produce cancerous changes. Our requirements for vitamin E's free-radical quenching action increase as we take more polyunsaturated oils. For this reason, supplements of vitamin E are used commonly in experimental feeding of fish oils in medical studies. Dr. Rudin recommends supplements of all anti-oxidant nutrients, including vitamins A, C and E and the trace mineral selenium for persons on high omega-3 diets. As discussed in *Felix Letter* 44, an intake of 150 to 600 IU of vitamin E daily keeps peroxidation in check.

Incidentally, some fish oil supplements have small amounts of vitamin E added as protective anti-oxidant. I'm all for this being done routinely.

****Not all fish oil manufacturers may hew to these standards, but then, fish itself suffers from the same contamination under many circumstances. The following fish are among those considered safe: Mackerel, herring, salmon, sardines, butterfish, pompano, mahimahi, steelhead trout, hatchery-raised trout, anchovies, halibut, cod, Pacific flounder, petrale sole, tile fish.**

Special note to readers who don't like to take supplements! In nature, a fish's polyunsaturated tissues are well protected by their high vitamin E content. Much of this fragile vitamin is lost in cooking. Of course, wild predators who eat fish raw don't have a problem, but since a diet of raw fish is neither altogether safe nor practical for most of us, we need to compensate for the loss of the vitamin, especially if we're eating lots of fatty fish. See *Felix Letter* 10 for a rundown on natural foods high in vitamin E.

Better yet, get vitamin E values in a useful reference for the home, *Food Values of Portions Commonly Used, 14th Edition,* revised by Jean Pennington & Helen Church. J.B. Lippincott, Phila, 1985. In it, you can easily look up calories, protein, cholesterol, vitamins, minerals, etc. of hundreds of foods.



Medical hierarchies should reflect a little before they 'dump' on fish oils. Forgive the pun, but except for their single-minded devotion to omega-6 polyunsaturates, they never really gave their hearts to nutrition! Like an indifferent husband in a marriage of convenience, they have a roving eye---in their case, for new drugs and surgical interventions that promise thrills they never got from their drab 'spouse.'

The vegetable oils and margarines they've pushed as panacea since the 1960's are high in omega-6 and low in omega-3 essential fats. Respectable scientists are saying that this imbalance in what are now conceded to be the chief components in the body's polyunsaturate-based regulatory system is very likely producing major adverse effects on health. To date, however, the hierarchy is stiffnecked about acknowledging the existence of any such problems.

It's comical, in a way, because while they're huffing about hazards in fish oil capsules, fish meal manufacturers in Norway, USA, Japan, etc., who produce all the world's commercial fish oil (100,000 tons a year as a byproduct of fish meal!), may be planning an end run around them. The oil is the same as that in supplements, except for pharmaceutical refinement and encapsulation. Some of it gets burnt as fuel, some is used in canned fish, but most of it goes to U.K., West Germany and Netherlands where, sadly, 95% is hydrogenated, i.e., turned into hardened saturated fat via heat and chemicals that destroy EPA and DHA, then blended into margarines and cooking fats.

Well aware of growing medical and public interest in polyunsaturated EPA and DHA, the fish meal industry is planning ways of adding significant amounts of refined and deodorized but unhydrogenated fish oils to salad dressings, mayonnaise, frankfurters, etc. The idea, aside from creating a new market for their oil, is to make it easy for people to get EPA/DHA in their diet without necessarily having to eat fish.

Myself, I'm tickled at the possibilities, so long as the foods are labeled as to fish oil and omega-3 content, and precaution used to keep the oils from peroxidation.

A NATURAL BALANCE

Now that we've laid out ways via foodstuffs and supplements to augment our EPA/DHA intake, let's go back to basics. I mean the "basic" essential omega-3, alpha-linolenic acid ("Alena" for short). It's found in all green chloroplasts of plants. Even though there's little fat in grasses and leaves, what fat there is contains more Alena than omega-6 linoleic acid ("LA"). In a natural state, wild herbivores eat great quantities and have good omega-3 and omega-6 levels in their tissues and hardly any saturated fat, compared with domestic animals. Predators and scavengers get their "good fats" from eating herbivores or other animals. All animals and humans transform some Alena into EPA/DHA, because they build cellular membranes, become hormonelike prostaglandins, and keep cholesterol from becoming the Phantom of the Arteries!

Before early man turned to agriculture, when our ancestors still were hunter-gatherers, they ate nuts, seeds, and tubers rich in omega-6 LA. They complemented this by eating Alena-rich leaves and EPA/DHA-rich animals and fish. Existing hunter-gatherer communities follow a similar diet. In other words, for good health and development, human beings depend on a balance of the fats that perform fundamental regulatory functions in our system.

For this reason, besides looking for pre-formed EPA/DHA sources, we should also be eating Alena and LA foods daily. Unlike wild game, beef muscle meat is useless as a source of "good fats." *Vegetarians or persons sensitive to fish may need extra Alena as an indirect EPA/DHA source (their own tissues will do the converting).* Flaxseed oil or flaxmeal contains both Alena and LA in naturally concentrated form. For tables of omega-3-rich foods, see appendix A in *The Omega-3 Phenomenon* by Rudin and Felix. (2)

It makes sense to make these choices as just one aspect of a protective diet and lifestyle. Beyond that, the writer's stock disclaimer is: "In serious illness, consult your health professional."

I would add: Try to choose one who is wedded wholeheartedly to the conviction that nutrition offers real 'magic' in the treatment of disease! ■

(1) *Nutrition & Physical Fitness,* 9th ed., by Bogert, Briggs & Calloway. W. B. Saunders Co., 1973.

(2) *The Omega-3 Phenomenon* by Donald O. Rudin, M.D. and Clara Felix. Rawson 1987. Paperback by Avon Books, 1988.

(3a) A. Leaf, M.D. & P. Weber, M.D. "Cardiovascular Effects of n-3 Fatty Acids," *New Eng J Medicine,* Vol. 318 No. 9, pp 549-557, March 3, 1988.

(3b) Leaf & Weber, "Cardiovascular Effects of n-3 Fatty Acids: An Update," *n-3 News, Unsaturated Fatty Acids & Health,* Vol III No. 4, Dec 1988.

(4a) A. Hirai, M.D., Y. Tamura, M.D., et al., "Clinical & Epidemiological Studies of Eicosapentaeonic Acid (EPA) in Japan," *Progress in Lipid Research Vol 25,* pp 461-466, 1986.

(4b) Y. Tamura & A. Hirai, "EPA & Adult Disease in Japan," *n-3 News,* Vol II No. 4, Dec 1987.

(5) J. Fisher, M.D., Letters to the Editor, *n-3 News,* Vol III No. 1, March 1988.

(6) S. A. Reed, Director, Marfleet Refining Co., Ltd., England. Letters to the Editor, *n-3 News,* Vol III No. 2, June 1988.

Illustrations are by Clay Geerdes and other artists as noted.

***The Felix Letter,* an independent publication by Clara Felix, is supported by subscription only. Sample issue and index to previous issues, $1 plus large self-addressed stamped envelope. Subscriptions are $10 a year (six issues) in U.S. For Canada & Mexico, $12 a year, U.S. cash or money orders only.**