the FELIX Letter
A COMMENTARY ON NUTRITION
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"FRIENDS, ROMANS, COUNTRYMEN.."

Paul Stitt and his wife Barbara own and operate Natural Ovens, a bakery in Manitowoc, Wisconsin, a small town on the shores of Lake Michigan. Their breads are special not just because they're made from good, natural ingredients and whole grains but because they contain a goodly amount of ground flaxseed, like the breads baked in ancient Rome. Historians tell us Roman soldiers marched with rations of whole grain loaves baked with flaxmeal. Flaxseed (linseed) from the flax plant, *Linum usitatissimum,* has a venerable history, along with the plant's fibers from which linen thread is spun. Archeologists say flax was being cultivated at least as far back as 5000 B.C. in Babylon. Egyptian tombs from 2000 B.C. contain linen-shrouded mummies, bolts of finely woven linen, and even chairs with seats made of linen cord. In the 5th century B.C., the physician Hippocrates described the use of flax to relieve abdominal pain and inflammation of mucous membranes.

Flax In Our History

The 1903 yearbook of the U.S. Dept. of Agriculture noted: *"Textile materials being a prime necessity of civilized peoples, the flax plant was one of the first agricultural products introduced into the American Colonies."* The same book relates the development of an important oil industry from flaxseed after the Civil War, not so much for food as for paint. *"In the activity of the westward movement of population, incident to the disbandment of the military forces, flaxseed culture...moved with the tide of progress gradually westward and northwestward..."* As towns and cities grew, increasing amounts of the oil were needed for paints and varnish which had become "the principal object of flaxseed cultivation" rather than linen products.

Unlike American housewives who preferred animal fats to vegetable oils for cooking and were not big consumers of linseed as a food oil, their British, European and Scandinavian counterparts prized the oil in their kitchens. By 1903, the United States, along with Argentina, India and Russia, had become a chief supplier of flaxseed oil to Great Britain, Scandinavia and most of Europe for cooking and industrial purposes both.

Flaxseed oil remained a major food oil for these countries until after World War II, when it was supplanted largely by oils such as corn, cottonseed, peanut, etc. that were being marketed on a big commercial scale.

A Great Omega-3 Source

FELIX LETTER readers undoubtedly know that flaxseed and the oil it contains are superb sources of alpha-linolenic acid, the vitamin- like, or "essential" Omega-3 fat. Once consumed, it can be transformed by enzymes in our body to the superpolyunsaturated fats, EPA and DHA. We also can consume these two Omega-3s in ready-made form from fish.

The Stitts put flaxseed meal in their breads because they happen to be scientists as well as entrepreneurs. Besides following closely the work of others in the field, they conduct their own research. When they gave their Belgian horses ground fortified flaxseed, in three weeks the animals' coats *"developed a beautiful sheen and dandruff was greatly diminished. In nine months, the cracked hooves were completely healed."* Chicks given the flaxmeal showed high tissue levels of Omega-3 and stronger bones than the chicks who didn't get it. Mink and fox on the meal ate their rations better, grew faster, and had shinier coats.

A few years before, Paul Stitt had developed "Fortified Flax," a product made of ground flaxseed to which zinc and vitamin B6 were added. He explains that flaxseed contains a B6 antagonist which should be balanced with a surplus of B6; also, flax is low in zinc. Besides using Fortified Flax in the animal feeding studies, the Stitts began giving pounds of it away to hundreds of volunteers in their community to enlist their aid in an informal two-month program. The first week, the volunteers took one tablespoon of Fortified Flax in juice. The second week and thereafter, they took it twice a day. Lowered blood cholesterol and blood pressure, less arthritic discomfort, and better skin were commonly observed. Some persons reported more pep and well-being. Constipation was alleviated in many, not surprising because flaxseed is a mucillaginous seed which tends to promote soft, bulky bowel movements and has a non-diarrhetic, mild laxative effect.

"Pellagra II"

The results paralleled many that Donald O. Rudin, M.D. saw a few years ago in his clinical pilot study with 44 patients over a two-year period.* Medically diagnosed chronic ailments of at least a year's duration responded--quite remarkably, in many cases--to linseed oil. The results bore out his theory that an unrecognized

Omega-3 deficiency in our diet is not only very common, even among well-educated fellow professionals on "good" diets, but lurks as an unsuspected factor underlying a variety of everyday illnesses. Rudin describes them as a kind of "Pellagra II," because as in classic pellagra (which happens when a person doesn't get enough of the B-vitamin niacin and the amino acid tryptophan), the disorders stemming from an Omega-3 deficiency include major and minor diseases that seem not to be connected either to diet or each other. The heart specialist may not have the foggiest interest in the fact that Mrs. Allen, his patient with the clogged arteries, also suffers from chronic bursitis for which she's seeing another specialist, and that both her heart disease and bursitis are kissing cousins to the dry skin that's been bothering her for years! Rudin says they may all stem from the same root: multiple nutritional distortions and imbalances, centering around a deficiency of the Omega-3 group of fats which the body needs to regulate its major functions.

Classic Pellagra

Pellagra caused so many physical and *mental* derangements, ranging from mild to fatal, that it took physicians a hundred years to recognize that the puzzling array of ailments actually were a single disease! A few more centuries had to go by before the origin of pellagra finally was proven to be not an infectious agent but a dietary lack of niacin (plus a lack of tryptophan from which the body can make niacin). It first devasted Europe in the 1700's. The same kind of epidemics swept through southern United States early in this century (ten thousand died of pellagra in 1915), leaving thousands of its victims, often women of childbearing age, to die in "insane asylums," for the last stage of the illness causes total mental breakdown. The nutrition connection was resisted strongly by many medical authorities until 1938, when newly isolated niacin administered to pellagra victims raised the patients almost from their deathbeds. Here's what Tom D. Spies, M.D., et al. wrote in THE ANNALS OF INTERNAL MEDICINE, 12:1830-44, 1939:

During the past year and a half, nicotinic acid [another name for niacin] *has been used in treating hundreds of cases of classic pellagra. ..Within 24 to 72 hours, the fiery redness and swelling of the tongue, gums, mouth, throat, and vagina subside...Within 24 to 72 hours, nausea and vomiting cease...Abdominal distention, pain and discomfort disappear....The acute, fiery red erythematous dermal lesions in which the epithelium is* [still] *intact blanch within 48 hours...Perhaps the most dramatic response of a pellagrin to nicotinic acid therapy is the disappearance of the acute mental symptoms. These symptoms, varying from slight confusion to delirium and mania, disappear rapidly, often overnight. The maniacal patients become calm and the confused patients, mentally clear.*

The same article describes little known aspects of early pellagra: *This period has insidiously advancing symptoms, all trivial in nature, but gaining in importance by their persistence. During this early stage, ill-defined disturbances of the alimentary tract, including indigestion, "dyspepsia," diarrhea or constipation, as well as weakness and lassitude develop without obvious reason. Irritability, depression, loss of memory, headache and insomnia are noted. Other early symptoms..include abdominal pain, burning sensations in various parts of the body, vertigo, numbness, nervousness, palpitation, distractibility, flight of ideas, apprehension and mental confusion....The development of clinical pellagra can be prevented in these subclinical cases by the administration of adequate amounts of nicotinic acid.*

Any of these sound familiar?! No wonder doctors had a hard time deciding it was a single disease, let alone one caused by the lack of a tiny vitamin that wasn't even isolated until 1937! You would think, however, that having been fooled for hundreds of years into not recognizing a deficiency disease when they saw one, the medical establishment would be a little more open to the possibility that ANOTHER hidden dietary deprivation might be at the bottom of many of our present-day health problems. No such luck! Nabobs in medicine (and, ironically, in nutrition) still are not willing to concede that (1) as a nation we are chronically low in Omega-3 intake, (2) that human beings really need the stuff, and (3) that an Omega-3 deficiency has any relation whatsoever to heart attacks, arthritis, skin ailments, immune system disorders, mental illness, etc.

This, despite the fact that the only two essential (vitaminlike) groups of fats, the Omega-3 and Omega-6, together:

. form the membranes of every one of the billions of cells in our body;

. control the way cholesterol works in our system;

. make up a very large part of the brain's active tissues;

. are the only fats that become prostaglandins, playing key roles in regulating: (a) the cardio- vascular, immune, digestive and reproductive functions; (b) inflammation and healing; (c) brain's functioning; (d) body heat and calorie burning.

An International Conference

Stitt told me he was invited to the NATO-sponsored workshop in Italy in June on the Omega-6 and Omega-3 fatty acids, at which some great scientists shared their work. I'll be reporting on the conference papers when they become available probably early next year. In the meanwhile, from notes Stitt made, here are some preliminary findings. Surprisingly, alpha-linolenic acid (nicknamed "Alena" by the researchers) captured the lion's share of the attention, the rest being divided between Omega-3 fish oils and Omega-6 vegetable oils. Dr. Bruce Holub of Ontario reported the Japanese consume only 14% less cholesterol per day than Americans, yet Americans have a 6.5 fold higher rate of heart disease. He said this may be related to the far higher consumption of Omega-3 foods by the Japanese than Americans. One of the good effects is that blood platelets become less sticky in individuals who consume plenty of Omega-3, lowering the risk of blood clots leading to heart attack and stroke. In his own research, he found that people who consume flax had blood platelets with very high levels of DHA, one of the Omega-3 fats responsible for non-sticky platelets. Dr. Renaud of France said he has found that even small increases in the Alena content of the diet had dramatic effects on cutting down on aggregation of platelets, which lowers the chances of thrombosis.

Alpha-linolenic acid (Alena for short) can be changed into DHA in our bodies. One of the ongoing arguments scientists are having is whether eating foods high in Alena allows us to make enough DHA (and EPA, the other important Omega-3), or whether we require foods containing preformed DHA or EPA, primarily fish and shellfish. Dr. Bourre of France reported that by feeding radioactively labeled Alena to animals, he could demonstrate that quite a bit of it appeared in the form of DHA in the brain, where large amounts normally are needed.

A New Anti-Cancer Substance

Back to flaxseed. Besides being a repository of world-class amounts of Omega-3 alpha-linolenic acid, this humble food is coming up roses in yet another way. Substances in plant fiber, called "lignans" [no, not "lignin" which is a different form of fiber] are being investigated extensively for the anti-tumor properties they exhibit in man and animals. We can make our own lignans, too, from plant lignans, or, rather, the microflora in our gut can do it for us. It looks like the more we make, the better our chances are of not getting colon and breast cancers! A number of studies show that low production (as measured by the amount excreted in urine) of two mammalian lignans (enterodiol and enterolactone) is associated with high rates of breast and colon cancers. Happily, a ***high rate*** of production/excretion of these lignans is seen in cancer-free persons generally. It's especially high in cancer-free vegetarians and semi-vegetarians. Nonhuman primates who are known to be very resistant to cancer on their normal diet also make a lot of lignan.

Now the flaxseed connection! Researchers tested commonly eaten fiber foods that contain precursor lignans; i.e., after we eat them the microflora in our intestines convert them to the helpful mammalian lignans. Rye, buckwheat, millet, soya, oats, wheat bran, and barley resulted in fair amounts of mammalian lignans being produced. *However, when flaxseed was eaten, more than one hundred times the amount was produced!* (800 micrograms of lignans produced per gram of linseed eaten, compared with 2 to 8 micrograms of lignans from one gram of any of the other grains. Incidentally, one gram of linseed oil consumed caused a yield of 17 μgrams of lignan.)

A Finnish scientist in the journal GASTROENTEROLOGY (H. Adlercreutz, Vol. 86, No. 4, pp 761-4, 1984) observes: *Many plant lignans show physiologic properties. These include anticancer, antibacterial, antifungal, antiviral, and insecticidal effects, which may benefit not only the plants but also those animals, including humans, which consume foods of plant origin.*

Finnish people in rural Kuopio who eat large amounts of fiber-rich cereals produce large amounts of lignan in their bodies, and also have very low rates of breast and colon cancer. The writer says:

The above considerations suggest that the link connecting colon and breast cancer in epidemiological studies could be failure of certain populations to consume sufficient amounts of specific fiber-rich foods, especially grain [not only bran, which does not significantly influence production of lignans] supplying plant lignans of the types that serve as precursors for animal lignans. A diet high in fiber, which increases fecal bulk and influences estrogen metabolism in a favorable direction, and which contains lignan precursors, might consequently be expected to give protection against both diseases.

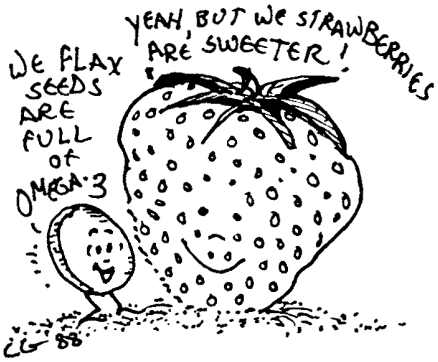
A professor on the faculty of medicine at University of Toronto concludes her paper on lignan with these words:

In summary, epidemiological data and biological properties of lignans suggest that diets with plant lignans or mammalian lignan precursors may have some protective effect against colon and breast cancer. Linseed is the most abundant source of lignan precursor known to date and it may therefore have a very high potential to reduce the risk for these diseases.

Friendly Flaxmeal

Bringing all this high-flown research down to practical levels, I can only suggest that, once again, a humble product of nature appears to be emerging as a star benefactor. I suspect the ancient Babylonians, Egyptians, Indians, Greeks, Romans, and Vikings knew what they were doing when they passed on to their ancestors the tradition of utilizing the small brown or golden seeds freely in foodstuffs. Paul Stitt tells me that grinding the seed makes it yield up its nutrients to us more readily, judging by animal studies. I'm breaking my no advertising rule to tell readers

that "Fortified Flax" is a product worth looking into. It's in a convenient form for those who don't care to grind their own and it also contains zinc and extra B-6 to compensate for flax's anti-B6 factor. Its natural mineral content is high; it's a superb fiber source and a great way to get your vegetarian Omega-3s. Stitt says laboratory tests show Fortified Flax in its sealed foil bag resisted rancidity completely for two years. It should be refrigerated after it's opened. (You may have to ask your health store to order some from their regular distributor or directly from Omega-Life, Inc. in Milwaukee at 414/786-2070. Some of the profits go back into research.)



How to use it? Personally, I stir anywhere from a teaspoonful to a tablespoon of it into my cooked or cold cereal. I add it to pancake and cookie batter, sprinkle it on salads, and stir it into casseroles and soups. It dissolves and tastes fine in a few ounces of fruit juice. Some individuals can handle several tablespoons a day without getting too laxative an effect, while others start with one teaspoon and work up gradually over a period of a few weeks.

Paul Stitt says he puts one tablespoon of Fortified Flax in orange juice in a blender, adds a banana for flavor, lets the mixture soak for a few minutes, then blends. He says it tastes like a malt, but he may be prejudiced! The flax now is organically grown in northern Canada by an "extremely careful farmer" on soil that has never been treated with pesticides or herbicides. The farmer is a biochemist who heard Stitt speak about the value of Fortified Flax at a conference of the Flax Council of Canada some years ago. Skeptical at first, he began using the product, liked its effects, and eventually began growing the flax for it. Now he's encouraging the Flax Council of Canada to put several million dollars into new research on the potential value to animals and humans of ground flaxseed. Doctors at the University of Toronto presently are feeding flaxmeal in a new experiment to 100 adults who have maturity-onset diabetes. The reason? In a preliminary study, flax got high blood sugar down better than any other high-fiber food!

The new reports on flaxseed couldn't have come at a better time. Readers tell me they haven't been able to find their usual brand of commercial linseed oil (Hain) in the health stores, confirming my own experience in the Bay area for the past few months. Some shops are carrying refrigerated unrefined flax oils made from organic flaxseed. These are very fine products, certainly important to individuals who are taking the oil therapeutically on the advice of their health practitioner, but costly for cooking, baking, or salad-making compared with the commercial refined oil. Until the situation changes, in our household we're using canola, walnut, or soybean oil for everyday kitchen use, because they are highest in Alena next to linseed oil, and periodically treating ourselves to the organic flax oil when the budget permits. To assure ourselves of ample Alena, as well as a splendid source of lignans and their potential in preventing cancer, we're finding simple ways, as described, of incorporating a tablespoon or two of ground flaxmeal into our daily diet.

Going In Style

Paul Stitt also sent me an article from NATIONAL GEOGRAPHIC of May 1954 entitled, "Lifelike Man Preserved 2,000 years in Peat." P.V. Glob, a professor of archeology at Aarbus University in Denmark, tells about the Tollund bog in Jutland, Denmark, which in May 1950 yielded "one of the best-preserved and most thoroughly investigated" bodies from the Iron Age. Bodies from the peat bogs of Jutland "have been preserved to such an astounding degree that they show not the slightest desiccation and lie with rounded limbs as if asleep." In most cases, they apparently are sacrifices to the Iron Age gods of 2000 years ago. Such seems to be the case with the Tollund man, whose finely boned face is exceptionally handsome and doesn't reflect suffering. *"It is rather the face of a man who in supernal exaltation took the noose around his neck, knowing that he went to his great goddess, to Nerthus, and that by his death he ensured the life of his people for the coming year."*

Perfect preservation extended even to the stomach contents. An autopsy established that his last meal had been a porridge made of a number of vegetables and ***barley and flaxseed!*** ■

*THE OMEGA-3 PHENOMENON by Donald O. Rudin, M.D. and Clara Felix, with Constance Schrader (Rawson Assoc./Macmillan, NY, 1987) clarifies for the first time the role of these fats as prime movers and shakers of human functions. Without them, the other nutrients can't do a proper job and our health suffers, yet the Omega-3's have been removed systematically from the diet for the last 80 years without alarms going up from the nutrition or medical authorities. When you put the missing-link nutrient back in your diet, you initiate powerful cooperative interactions in your body among ALL the nutrients. The book is the first practical guide for using the Omega-3's in a diet and supplement program to achieve a level of health that has eluded too many of us unnecessarily. If you can't find the book locally, the publishers have a tollfree ordering service for VISA or MasterCard holders at 1-800-323-7445, between 9 & 5:30 Eastern time.

Illustrations are by Clay Geerdes and other artists as noted.

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