the FELIX letter

A COMMENTARY ON NUTRITION

Nos.110 & 111 **2000**

ANCIENT OLYMPIA

In the late '60s, soon after the movie *Zorba the Greek* came out, a first-time folk dancé cafe opened in West Los Angeles. Cafe Danssa was not too big a haul from our then Pacific Palisades home, so along with a trio of my daughter's Pali Hi girlfriends I got hooked on Greek dances. Many were traditional ones done to folk songs with origins lost to antiquity, others to music like Mikos Theodorakis' haunting melodies from the film. Believe me, it didn't hurt a bit that the young engineer from Athens who taught the dances did them with heart-stopping macho grace.

On a balmy early June night in Ancient Olympia, Greece, I and scores of other conferees were enjoying the official banquet of the **Fourth International Conference on Nutrition and Fitness**. Bill Toomey, vice-president of World Olympians and 1968 Decathlon champ (10 track & field events), had just given his talk on the history and meaning of the Olympics. We were seated in the spacious outdoor section of a village restaurant at tables in vine-covered arbors. The music started -- *Greek*, of course. A costumed troupe of lithe young men and women emerged on the large wooden dance floor, twirling, kicking, and stomping out vigorous regional dances. As their performance ended my heart was beating overtime. Would they...? Yes, they did! -- they beckoned us to join them in a *Sirto*, a traditional line dance where only the leader needed to be a hotshot. I raced from my table to join the line, clasping hands on both sides, and soon was floating to the music, feeling...well, at least 30 years younger.

Out of the corner of my eye I saw Dr. Artemis Simopoulos skimming across the floor to lead the next *Sirto*. This Washington DC-based scientist whose research and writings inspire legions of fellow researchers as well as journalists like myself, and who was cochair of the conference (along with Constantinos Pavlou, DSc, of Greece), grew up on the Greek island of Crete. No wonder she led the *Sirto* with such style, on her face a look of bliss I understood so well!

Pickles/Brian Crane

Back home weeks later, I phoned Dr. Simopoulos in DC and learned she had already been to the big ISSFAL 2000 meeting (Intl. Soc. for Study of Fatty Acids & Lipids) in Japan and had just returned from yet another conference in *China*. (Meanwhile, your sissy editor was still nursing jet lag.) When I described what a pleasure it was seeing her lead the *Sirto*, she told me that as a 16-year-old in high-school she'd danced the classic, stirring *tzamiko* for the then queen of Greece--"there's *nothing* that lifts the spirits like Greek music and dancing!" (My amen to that.) Note: Belly dancing (see above) is ***not*** Greek dancing.

Traditions of Greece

The conference's five days of morning-to-nite talks and poster sessions took place in a modern building in a country setting, a short hike from the site *of the first Olympics in 776 BC*. There's a fine museum there, and afterwards some of us strolled through fields of wild flowers and very old olive trees, songbirds trilling everywhere, to view massive fallen columns of ancient temples. My hotel was a few miles away in the town of Ancient Olympia, a 6-hour conference-bus ride from Athens. Across the Peloponnesus peninsula we'd seen flocks of sheep, miles of vegetable farms and groves of olive, fig, citrus, walnut, etc. trees. Simopoulos' personal dedication not just to optimal nutrition but to fitness reflects a theme powerfully etched in Greece's history, art, and science. She began her talk at the opening ceremonies on May 25 with a quote from the physician Hippocrates:

"Positive health requires a knowledge of man's primary constitution *[which today we call genetics]* and of the powers of various foods, both those natural to them and those resulting from human skill *[today's processed food]*. But eating alone is not enough for health. There must also be exercise, of which the effects must likewise be known. The combination of these two things makes regimen, when proper attention is given to the season of the year, the changes of the winds, the age of the individual, and the situation of his home. If there is any deficiency in food or exercise the body will fall sick." *[480 B.C.]*

The Changing Nature of Health Problems

But here we are in the 21st century coping with concerns not easily foretold in the 5th BC. As traditional societies around the globe rush towards industrialization, farming communities lose people massively to cities, where physical activity tends to go down and caloric intake go up. Benjamin Torun MD PhD (Inst. of Nutrition of Central America & Panama, **Guatemala City, Guatemala**) described urbanization as a mixed blessing.

At its best, he said, it can bring improvement in socioeconomic and sanitary conditions, better access to health services, reduced burden of heavy physical labor, and a more energy-rich diet -- all of which can reduce infectious morbidity and increase life expectancy. ***But***, some of these changes steadily raise "the risk of cardiovascular and other non-transmissible chronic diseases."

The New "Urban Obese"

According to C. Gopalan MD PhD DSc (Nutrition Fndtn of India, **New Delhi, India**), countries of the Third World "currently undergoing transition are also increasingly facing the threat of emergence of obesity as a public health problem among the relatively affluent sections of their populations. These latter consist largely of people born in poverty in rural areas and later migrating to urban centres."

Thus, in developing countries of South East Asia the numbers of the "urban obese" who suffer from obesity-related insulin resistance, diabetes, and cardiovascular disorders are rapidly escalating. For these countries, Dr. Gopalan said, the old unsolved problem of poverty and undernutrition, plus the emerging one of obesity and its attendant ills, constitute a new "Double Burden."

Estelle V. Lambert PhD (Sport Science Inst. of South Africa, Univ. of **Cape Town, South Africa**) said Southern and Eastern Africa face a similar "double burden." While under-nutrition and infectious diseases such as tuberculosis and HIV remain endemic, the morbidity from chronic diseases is increasing, along with the prevalence of contributing risk factors such as smoking, reduced physical activity, and a change "from a more traditional to a Westernized diet."

Little Fatties, Too

K.Y. Choi and G.S. Guldan (Chinese Univ. of Hong Kong, **Hksar, China**) observed that in Hong Kong 22% of children now are obese. (Like USA kids, they watch a lot of TV.) Since coronary heart disease (CHD) is a major cause of death in Hong Kong, this current epidemic of childhood obesity is cause for concern because "risk factors for CHD track from childhood into adulthood and are interrelated."

Vulnerable Ethnic Groups

Jaap C. Seidell PhD (Dept. for Chronic Diseases Epidemiology, Natl. Inst. of Public Health & the Environment, **Bilthoven, The Netherlands**) concurs that obesity and type 2 diabetes are increasing worldwide. Both are common consequences of the change to more sedentary lifestyles along with higher energy intakes, but rates of diabetes are going up especially fast in Asian countries, where the risks of type 2 diabetes mellitus "tend to increase sharply at levels of BMI [body-mass index] generally classified as acceptable in Europeans and North American white people." In other words, Seidell says, Asians are more vulnerable to developing type 2 diabetes when they're obese than Europeans are.

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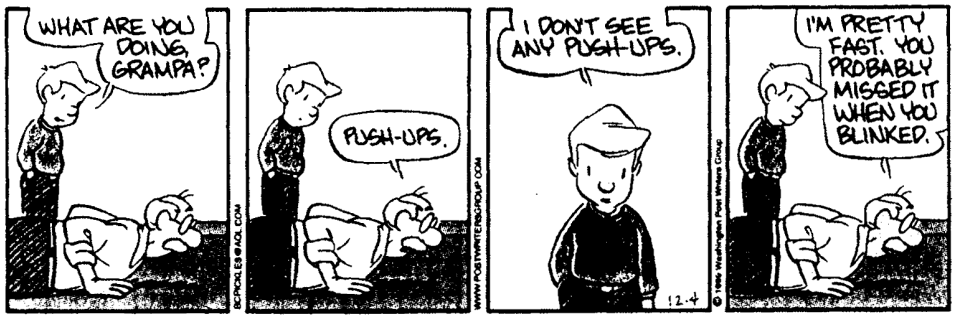


Incidentally, this may be true of Native Americans as well, and also of "Hispanics"--the largest and most rapidly growing ethnic minority in the U.S., composed of Mexican Americans, Cubans, Puerto Ricans, Hondurans, El Salvadorans, Guatemalans, etc. Kurt P. Merkelz MD (Division of Community Geriatrics, Univ. of Texas Health Science Center, **San Antonio, TX**) says that among chronic diseases, the leading causes of 'excess' deaths among Hispanics are diabetes mellitus type 2 and heart disease.

Some Conference Answers

Revving up physical activity was high on the conferee's list of approaches to the new 'urban obesity' and attendant ills, as you'll see from this sampling. Actually, 'sampling' is all I could do: there were over 50 talks and as many poster sessions, in this distinguished international gathering.

George Rontoyannis MD (Univ. of Thessaly, **Thessaly, Greece**) said *walking* not only is the most natural activity but is safe, inexpensive, and effective in treating cardiovascular ailments, diabetes, osteoporosis, and obesity.

M.L.Wahlqvist et al. (Monash Univ., Clayton, **Victoria, Australia**) talked about the salutary effects of physical activity in healthy aging: "...recent evidence underscores just how much gain survivors can get from the combination of endurance and strength training well into later life" even in their 80s. A big plus for nutritional well being of older people is the extra calories exercisers can eat without risk of fatness.

Len Storlien PhD (Univ. of **Wollongong, New South Wales, Australia**) talked about the "Metabolic Syndrome," a cluster of diseases "including diabetes and obesity, both of which are rising to epidemic proportions in developed and developing countries." Animal models make it clear that persistent physical activity "improves insulin action, particularly in skeletal muscle, the most important tissue for insulin-stimulated glucose uptake."

Exercise and Genes

Ji Di Chen MD (Beijing Medical Univ., **Beijing, China**) said exercise can counterbalance effects of genes that predispose many of us to tubbiness and disorders like diabetes. "Insulin-resistant" folks may make enough insulin but their muscle cells don't respond adequately to insulin-stimulated glucose absorption. Result: under-energized muscles and too-high blood glucose. Chen says *physical activity specifically steps up expression of a gene that encourages glucose uptake in muscles,* as well as of other genes that help to regulate fat breakdown.

Benefits Galore!

John D. Cantwell MD (Morehouse School of Medicine, **Atlanta, GA**), team physician for the Atlanta Braves and Georgia Tech, said we're under-using this great modality--regular moderate exercise--for prevention and treatment of many ills, not just cardiovascular disease. It lowers blood pressure, improves blood sugar metabolism and insulin sensitivity. Physical activity enhances dietary weight control programs, helps to relieve anxiety and depression, decreases risk of colon and breast cancer.

"In older individuals, strength and conditioning training can help reduce the risk of falls and preserve the maintenance of independent living." Despite all this good stuff, "only one in five U.S. adults" gets an adequate amount of sustained physical activity each week (*five sessions of at least 30 minutes*). "The fault lies not just with patient lethargy but also with physician apathy.....All patients should be encouraged to obtain a minimum of 30 minutes of excercise most days, to include endurance training plus strength and flexibility activities."

[**Berkeley, CA.** At this point, awash in guilt, I've torn myself away from the Mac to do a 15-minute jog on my little bedroom trampoline, holding 3-lb weights in each fist. Tomorrow I'll tap dance and, the day after, swim. Sure. Promises, promises...]

Shake Tushies, Chase Away Blues!

O. Matsouka et al. (Democritus Univ. of Thrace, **Komotini, Greece**) designed a program for 55 healthy women aged 60-75 from local towns to examine influence of exercise on their emotional and mental states. For ten weeks they took part in either once, twice, or thrice weekly exercises to improve aerobic capacity, general strength, flexibility, and communication. Improvement of their feeling state "was proportional to the frequency of their implementation" of the program. For better emotional and mental health apparently the women needed to exercise at least twice a week.

Marie Annette Brown, PhD et al. (Univ. of Washington, **Seattle, WA**) tested the effects on women's mood of a tri-modal intervention: LEVITY -- acronym for Light, Exercise, and Vitamin Intervention Trial. For eight weeks, about 100 women ages 19-68, in good health but reporting mild to moderate depressive symptoms, were instructed to (1) take a brisk daily 20-minute outdoor walk at 60% of their maximum heart rate; (2) increase daily exposure to natural light; and (3) take a daily supplement providing 50mg each B_1, B_2, & B_6; 400 mcrgrm folic acid; 200 mcrgrm selenium; & 400 IU vitamin D_3. The ladies kept a log and every two weeks had telephone coaching. Dr. Brown said there was a high level of adherence, "with two-thirds...reporting 100 percent adherence or more." LEVITY worked to improve overall mood, self-esteem, "and general sense of well-being." Not surprisingly, symptoms of depression decreased.

This being a forum celebrating Olympian ideals, many presentations focused on sustaining high performance in athletes.

Super-Athletes Need Omega-3s!

In an 8-week trial, Peter L. McLennan, et al. (Smart Foods Centre, Dept of Biomedical Science, Univ. of **Wollongong, NSW, Australia**) provided highly trained endurance cyclists with fish oil capsules supplying a total of 2.6 grams DHA & 0.5 gram EPA daily, while the placebo group got olive oil capsules.

There was no difference between the groups after 8 weeks in actual 'time to fatigue' in endurance tests using an electronically braked cycle ergometer. However, the fish oil group had *lower heart rates* for submaximal workloads, as well as significant *decreases in peak heart rates* -- indirect indicators of reduced oxygen consumption by the heart, i.e., *the omega-3s [w3s] in fish oil promoted greater cardiac oxygen efficiency.*

Drink Your Carbos!

Dimitrios Bourdas (Univ. of Athens, **Athens, Greece**) & Tom Cohrane (Univ. of Sheffield, **UK**) did a critical review of studies from 1975-1998 on effects of carbohydrate (CHO) ingestion during endurance exercise by male athletes. Conclusion: *In general, when 200-300 milliliters of CHO solution were consumed throughout exercise at 10-30 minute intervals, performance improvement took place,* regardless of CHO concentration (anywhere from 5 to 50%), type of CHO ("glucose-polymer, glucose, sucrose, combination"), or type of exercise (running, cycling). In summary, reliable studies suggest "CHO supplementation during exercise can delay fatigue and increase performance on average by up to 30%."

Creatine Supplements, Anyone?

Jorika Roode et al. (Dept. of Sport Sciences, Technikon Pretoria, **Pretoria, South Africa**) explained that our bodies naturally synthesize creatine phosphate, also known as phosphocreatine (PCr), as a major energy source for muscle contraction. Body builders swear by creatine supplements. But would these help well-trained athletes? During either 6 or 12 weeks of training two groups of endurance cyclists consumed 3 grams a day of creatine monohydrate (considered to be a low maintenance dose for such athletes). At the end of the trials, in contrast to the placebo group given plain sucrose tablets, both supplemented groups showed important increases in work performed (cycling), achieving higher maximum work loads and greater power output. In the 12-week group, muscle and lean body mass increased significantly as well.

Roode thinks the greater availability of free creatine from supplements "might enable the endurance-trained individual to optimize his/her muscle PCr stores during exercise and during recovery after training," allowing this type of athlete to benefit from higher training intensity.

Felix aside: Jorika Roode, who pronounces her name "Eureka," is a 6-foot blond knockout from a South African farm family. This comely young woman teaches and also competes regularly in triathlons: running, swimming, and cycling, for which she trains endless hours *every single day 11 months each year* -- this was her month off! Fair Jorika and dark, intense Antonis Raftis, a Greek psychologist and nutritionist from Cyprus who runs 5 miles a day and kept Jorika and me in stitches with his tongue-in-cheek anecdotes, were my incomparable companions for the post-conference bus ride back to Athens and later, the climb from the city's ancient quarter, The Plaka, to the Parthenon high on the Acropolis. I admit to doing a lot more panting going up the steep stone steps than they did.

Pickles/Brian Crane

Danger Spots for Serious Athletes

David C. Nieman MD (Appalachian State Univ., **Boone, N. Carolina**) cautioned that many components of the immune system "exhibit adverse change after prolonged, heavy exertion." Ninety minutes of it for an athlete can lead to anywhere from 3 to 72 hours of altered immune function, such as low levels of protective immunoglobulin IgA in nose, saliva, and lungs; and high levels of cortisol and inflammatory cytokines.

Many exercise immunologists say "during this 'open window' of impaired immunity... viruses and bacteria may gain a foothold, increasing the risk of subclinical and clinical infection." Until all scores are in on effectiveness of different supplements to boost immunity, Nieman believes athletes should focus on getting a "varied and balanced diet" and pay attention to optimal calorie, vitamin, and mineral intake.

He does, however, advocate drinking about one liter an hour of a 6% carbohydrate beverages "before, during, and after intensive endurance exercise lasting longer than 90 minutes," to ease immune-system stress.

Concerns of Women Athletes

In a collaborative effort by faculty from two Greek university sport science departments (Democritus Univ. of Thrace, **Komotini**, and Aristotelian Univ., **Thessaloniki**) A. Lailoglou et al. compared *menarche and incidence of menstrual disorders* in females 12 to 18 years old, 22 of them nonathletes, and 76 intensively-trained athletes. The athletes doing intense gymnastics had late onset of menstruation (~15 years, compared to ~12 years in nonathletes). Only 39% had regular cycles compared with 61% of the nonathletes; and about 67% didn't menstruate at all.

Suggested causes: very low body fat--as low as 14% (in nonathletes it averaged 25%); long years of training; high anxiety states.

Can high-intensity training upset more than just menstrual functions in women athletes?

S. Samartin, A. Marcos, et al. (Instituto de Nutrición, Facultad de Farmacia, **Madrid, Spain**) and R.K. Chandra (Janeway Child Health Centre, **Newfoundland, Canada**) collaborated on a series of studies of three groups of 13 to 17 year-old sportswomen--ballet dancers who worked out 20-25 hours a week, artistic gymnasts (40-48 hours/wk), and rhythmic gymnasts (48 hr/wk workouts), comparing diets, body composition, and immune parameters with 50 volunteer controls matched for age and sociocultural level who did about 2 hrs/wk of physical exercise.

Some athletes, the researchers note, "in particular, young female elite gymnasts and ballet dancers, may make a conscious decision to reduce food intake at a time when physiologic demands are highest. Restriction of food intake has been shown to delay puberty, cause growth failure and induce immunosuppression."

"Body composition parameters mostly showed depletion in the young sportswomen..." (Let's face it--by every anthropomorphic standard the girls were downright scrawny--a logical outcome of working like horses and eating like sparrows.) Conclusion: according to all immune parameters tested (white blood cell count, etc.), and compared with controls, all the athletes also had *seriously depleted cell-mediated immune systems.*

Eating Problems of a Different Sort

Dancers and gymnasts may voluntarily starve themselves, but can nutrition workers do something for kids undernourished through no choice of their own? Miriam Munoz de Chávez et al. (Universidad Autonoma del Estado de Morelos, **Cuernavaca, Mexico**; and Instituto Nacional de Nutrición "S.Z.", **Mexico City**) gave corn tortillas enriched with soybean, 5 vitamins, and iron to toddlers and first-graders for a year, replacing the usual tortillas that provided 78% of energy requirements in this very poor community. The youngsters got much better at a variety of exercises, compared with the kids eating regular tortillas. Same improvements happened after the latter bunch finally got enriched tortillas too.

A Paleolithic Perspective

In his keynote address S. Boyd Eaton MD (Emory Univ., **Atlanta, Georgia**) described the public's confusion and skepticism about advice on what to eat and how to live, because the recommendations seem "to do an about-face" every time a new medical study comes out.

To make sense of diverse health problems, an overview--a binding theme--is needed. Eaton offered an *evolutionary perspective.* The "genetic bases of current human metabolism and physiology," he said, "were established during the evolutionary experience of our remote forebears. Over millions of years, alterations in ancestral lifeways occurred slowly, in concert with appropriate genetic selection."

However, since the beginnings of agriculture 7-8 thousand years ago, and now with industrialization, "genetic adaptation has been unable to keep pace with cultural change, so that our genetically determined biology and the circumstances of our lives are out of alignment."

Pickles/Brian Crane

Frank and Ernest/Bob Thaves

For instance, when our ancestors still were solely gatherer-hunters, physical activity typically was "four times that of affluent Westerners" today. As for their diet, they ate plenty of protein, fiber, and micronutrients. Not much salt. Essentially no grains. The natural fats they got (saturated, monounsaturated, and polyunsaturated) from nuts, seeds, veggies, fish, shellfish, game ***had about a 1-to-1 ratio of w6 to w3*** vs. ~ 10 to 1 for Americans, Eaton said. [CF: For many, it's more like 20:1.]

He strongly advises examining diet and activity patterns that allowed our forebears to survive as a successful species during the preagricultural Paleolithic era. 'Prevention research' could explore how the loss or distortion of these patterns fosters "chronic degenerative afflictions of affluence." And conversely, we can investigate the ways in which "reversion toward Paleolithic patterns should be beneficial."

It was the article "Paleolithic Nutrition" by Eaton and Konner in the Jan. 31, 1985 *New England J. of Medicine* that blazed a trail for concepts then considered revolutionary. I treasure the 1988 book, *The Paleolithic Prescription,* by Eaton, Marjorie Shostak, & Melvin Konner MD PhD and its dedication: "To the memory of our ancestors, whose genes we bear, and to the small number of remaining hunters and gatherers who have taught us so much about ourselves."

Pickles/Brian Crane

Fueling Our Bigger Brain

Loren Cordain PhD (Colorado State Univ., **Fort Collins CO**) & Bruce A. Watkins PhD (Purdue Univ., **West Lafayette, Indiana**) said our big brains evolved over a few million years "at the expense of a reduction in the size and metabolic rate" of our gut. That meant early hominids were losing their capacity to process the huge amounts of fibrous plant foods that other primates still do. Thus they had to seek out more concentrated sources of nutrients for a brain whose energy requirements kept expanding. (Our brain, only 1/40th the body's weight, uses 20% of its energy!)

Most important, we needed more and more *w6 arachidonic acid and w3 DHA, the chief polyunsaturated fats in brain.* Where did we get them? "The fossil record indicates that the emergence of species of our own genus occurred coincidentally with the appearance of crude stone tools that were used to butcher carcasses of scavenged and/or hunted ungulates."

Apparently those early characters may not have been such mighty hunters, but at least they figured out how to crack open skulls and long bones left by whatever did the real hunting! Marrow supplied energy, and *brains supplied AA and DHA,* and early humans got smarter and smarter.

Cordain said fish would have been a source, too, but he, Watkins, and Eaton don't credit aquatic foods with the major role in supplying brain-food to early hominids as Dr. Michael Crawford does [*Felix Letter #58*]. I vote with Crawford -- mollusks and crustaceans would have been easy pickings, more so than antelope skulls. But it must've been extra nice for Oonga and her mate to have both, no?

Infant Formula

As you see, 'my' beloved w3 fatty acids got plenty of play in the conference. Ricardo Uauy MD PhD (Universidad de Chile, **Santiago, Chile**), like Dr. Simopoulos has long been a passionate advocate for getting "long chain polyunsaturated fatty acids (LCPs)," specifically w6 arachidonic acid and w3 DHA, into infant formula, especially for premature babies. Breast milk, of course, contains both but most USA formulas as yet don't.

Dietary w3 deficiency *affects eye and brain function adversely* in preterm and term infants -- not surprising, since the main LCPs in brain normally are arachidonic and DHA in about equal proportions; while DHA is the chief LCP in the retina of the eye. Dr. Uauy said recent studies show preterm infants seem to be able to form arachidonic acid and DHA from precursors (w6 linoleic and w3 alpha-linolenic respectively) but in only very small amounts, *especially DHA.* This reinforces the need to enrich formula with pre-formed LCPs for their "demonstrable effects on somatic growth and neural development."

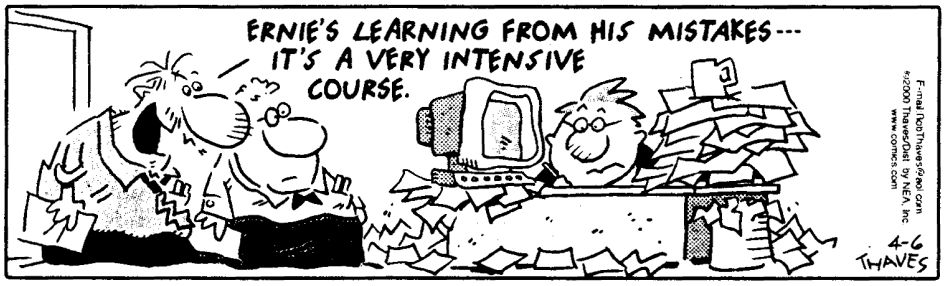
Brainier Eggs!

I was happy to see George S. Bass' poster exhibit on the virtues of his Country Hen 'designer' eggs and to meet the man who had the vision in 1988 to create the first and now the largest farm (**Hubbardston, MA**) to produce and market super-w3 eggs. 'Country Hens' get the right feed, so they lay eggs with almost five times more w3s than market eggs -- close to the w3 content of eggs laid by free-range hens on a farm in Greece 'dining' on wild purslane, insects, grasses, plus some barley flour and corn, as described by Dr. Simopoulos and Norman Salem MD in the Nov. 16, 1989 *New England J. of Medicine.*

Heart-Savers

Alexander Leaf MD (Dept of Medicine, Massachusetts General Hospital, & Harvard Medical School, **Boston, MA**) told the conferees how *a unique characteristic of w3 fatty acids may be directly responsible for saving lives.* Puzzling to medical science are the great numbers of people who die of heart attacks who *didn't* have blocked arteries from atherosclerosis.

Frank and Ernest/Bob Thaves



Instead, such folks are done in because their hearts go into arrhythmic, uncontrolled beating that degenerates into *fibrillation*, i.e., the heart *quivers* instead of pumping blood & life into tissues--spelling *finis* regardless of pristine coronary arteries.

Australian researchers McLennan, Abeywardena, & Charnock in 1985 showed in animal studies that fish oil dramatically stopped "ventricular arrhythmias." Dr. Leaf, another early w3 champion, began his group's work soon after, and by now there's a growing body of *clinical* evidence the w3s probably are "potent and safe antiarrhythmic agents in humans."

The w3 polyunsaturated fatty acids do indeed protect heart muscle from lethal arrhythmias by their specific ability *to modulate and stabilize "the ionic currents responsible for electrical activity of the heart."* [That's in line with Peter McLennan's report above on fish oil fatty acids reducing heart rate and conserving oxygen for endurance athletes.]

Omega-3s Calm Nerves, Too!

Moveover, Leaf found that the *w3s apparently modulate ionic currents and reduce excitability in neural tissue* (brain, nerves, etc.) in much the same manner! It may explain the good effects of w3s on depression in recent medical studies; also, why fish-eating populations don't get the blues too much. Finally, it may shed light on how w3s help in bipolar disorder, as next described.

Since 1983, when I first was blitzed by Dr. Rudin's panoramic vision in his 1981 *Biological Psychiatry* article, "The major psychoses and neuroses as Omega-3 essential fatty acid deficiency syndrome: Substrate pellagra" (16:837), my own policy has been: it's dangerous for the mind and body *not* to take in plenty of w3s! I eat fish and shellfish many times a week; ground flaxseed daily; flaxseed oil + butter in my spreadable "Better Butter"; and fish oil supplements especially in cold weather when I've gone too long not eating fish. The stuff works!

Manic-Depression & w3s

At the conference Andrew L. Stoll MD (McLean Hospital, Belmont MA; Dept of Psychiatry, Harvard Medical School, **Boston MA**) talked about his group's 4-month study of 30 patients with bipolar (manic-depressive) disorder. This all-too-common illness with its "high morbidity and mortality" places heavy burdens on patients and families. Even with "mood-stabilizing drugs, such as lithium carbonate and valproate," the disorder tends to recur.

Stoll's patients got 7 capsules twice a day suppying either ~10 grams EPA+DHA or the placebo, olive oil. The observed benefits earned the study its publication and an editorial in the May 1999 *Archives of General Psychiatry,* plus national news stories.

Dr. Stoll said he made enough errors in the design of the trial to want to do it right the next time! He's getting the chance, with National Institutes of Health backing. For instance, patients who got fish oils *knew* it (odor, aftertaste), possibly raising their expectations, so the researchers will use either fish-flavored olive oil from now on, or deodorized fish oil, to blur distinctions between w3s and placebo.

Stoll knew from his and other's previous work that all current drugs for bipolar disorder achieve their mood-stabilizing results by exerting "inhibitory effects on neuronal signal transduction systems." In other words, *overactive nerve cell signaling* may be the abnormal mechanism driving the disorder.

The w3 fatty acids had been pinpointed [by Leaf and others] as having powerful anti-excitatory effects not just on heart muscle cells, but on *neuronal tissue as well.* So Stoll's group decided to find out whether high-dose w3s from fish oil, by enforcing a "general dampening" of overactive signal transduction pathways in nerve cells, would also be a good mood stabilizer in bipolar patients.

Good News

The answer from this small preliminary study appears to be a very probable yes. Dr. Stoll, couching his optimism in restrained 'scientese,' described the w3s as "non-toxic, essential dietary lipids, with few side-effects even at high dosage. The indirect and direct indications of the efficacy of the omega-3 fatty acids, combined with the need for safer and more effective treatments for patients with mood disorders, warrant undertaking larger and more rigorously designed clinical studies."

An Aside on Searches

Rudin had pushed for just that in journal publications beginning in 1981, but Stoll hadn't cited Rudin's w3 work in his article. I guess people are always reinventing the wheel. In the coffee lounge during a break, after introducing myself I asked Andy Stoll (who looks as young as my kids) why he'd overlooked Rudin's 1981 *Biological Psychiatry* and other papers, since they reinforced Stoll's own theme so well. His answer? The 'Medline search' (by computer, of course) hadn't come up with any of it.

I suppose 'searching' no longer means long hours in university libraries poring thru medical indexes, hunting-gathering in library stacks, and shlepping heavy journal volumes to sift thru and choose what to xerox. If it's not on the Web, it doesn't exist, right? I have news for you dreamers: someone 'out there' decides what does and doesn't get on Medline, etc. so you may be being diddled and not know it. I'm lucky to be near the great UC Berkeley and UCSF libraries for do-it-myself searches.

An Addendum to the Big Picture

Andrew Stoll said when he finally read the 1981 article he was impressed. Boyd Eaton had offered the conference an evolutionary perspective, to help guide it towards nutrition and fitness goals compatible with our Paleolithic-derived genes. The conference needed one other overview, I'd hoped by Rudin, to fit the scattered pieces of w3 research into a global picture.

He'd laid it out in 1981 and subsequent papers, and in the two books* I coauthored: how the industrial creation of a devastating w3 dietary deficiency in the USA was a uniquely mid-20th century *lipid-based* version of earlier B-vitamin deficiencies that scourged poorer populations with beriberi and pellagra.

Pellagra, manifesting itself as every kind of physical and nervous system disorder, culminating in insanity, was treated as an infectious disease, until niacin was first administered in 1938 and miraculously rescued victims from 'insane asylums,' disease, and death [*Felix Letters 17 & 43*].

In a parallel way, every conceivable physical and mental disorder today, Rudin said, will arise from *distortions of key regulatory functions* that take place in phospholipid membranes of every cell, set off by deficiencies or imbalances of the w3 and w6 fatty acids that form the hormonelike prostaglandins. (All disorders of course will be exacerbated by other excesses and deficiencies, pollutants, lack of physical activity, and so on.)

That's why he set up the first and possibly only pilot study to see what flaxseed oil or fish oil supplements could do for common chronic physical and mental ailments, *by bringing this regulatory system back to normal.*

The medical world hasn't entirely caught up with these concepts, but as so many of the conference papers showed, it's getting closer!

*The Three Pellagras, *Orthomolecular Psychiatry,* 12 (2):1983, 91-110.
The Omega=3 Phenomenon by Rudin & Felix with C.Schrader, 1987. Rawson Assoc.
Omega 3 Oils (Rudin & Felix), 1996. Avery Publishing Group. Also published in Japan (in Japanese) and Taiwan (in Chinese) by individual publishers.

Pickles/Brian Crane

Conference Coda

I'd originally been scheduled to be on the journalists' panel which, on the last day, would participate in a general roundtable on ways to implement conference goals. However, the night before, the two hardworking women of the Greek travel agency who'd shepherded us through the complex tour explained if I didn't take the early morning bus to Athens, I would miss the plane for my three days in Crete!

Dr. Simopoulos asked me to write a defining statement that would be read for me at the roundtable. So, as it turned out, I never met my fellow journalists (from *J of American Medical Assoc., J. of Am. Dietetic Assoc., European J of Clinical Nutrition,* etc.) or heard their contributions, but here's mine:

"I'm blessed with a rare privilege--that of being an independent commentator on nutrition issues. Since I don't have to please editors or apply for grants, etc., I'm free to follow my journalistic nose for news. It led to *The Felix Letter* being the first nutrition newsletter to write about Dr. Donald Rudin's concepts on the overall systemic regulatory effects of what he'd described in 1981 as the "missing link" essential fats in modern diets--the omega-3s.

"He had seen remarkable across-the-board improvements in chronic physical and mental ailments of the 44 volunteers, 12 of them mental patients, who took flaxseed oil or fish oil in his 2-year pilot study beginning in the late '70s. It was his 1981 report in *Biological Psychiatry* that stirred my journalistic instincts.*

The growing medical and public interest in the omega-3s -- at least a little of it based on the two books we coauthored and my updates in *The Felix Letters* -- has given me the courage to say we writers ***can*** make a difference.

"My nose for news has been following another promising trail -- one I hope you clinicians and researchers will pick up soon. The cyanide in cyanide-yielding plant foods is always classified as a toxin. It's one phytochemical uniformly treated as an enemy.

"We're overdue for new thinking on this. I've been following the work of a West African biochemist working in the USA, Oji Agbai PhD ND, who has proven *in vitro* and clinically that *thiocyanate* safely and effectively stops red blood cell hemoglobin from sickling in persons homozygous for sickle-cell disease. Thiocyanate is what birds, animals, and humans make from cyanide that's found in some of their most favored plant foods, including berries, many grasses, millet, manioc, and flaxseed. Pre-formed thiocyanate we get from such foods as yams and cruciferous vegetables. Currently, the isothiocyanates in broccoli are being investigated for their protective anticancer activity.

"Thiocyanate is a normal constituent of our plasma. It not only stops red blood cells from sickling, it lowers high blood presssure, and it may have anticancer action. It's a molecule badly in need of exploration!

"Many of you are my research and clinical heroes. ***You are making a difference.*** And I'm honored to continue to write about your work. ❑

* It also started a chain reaction in Japan! Dr. Harumi Okuyama wrote me in '98 that he was inspired, soon after reading Rudin's paper, to enter the research field of essential fatty acid deficiency. In 1992 he founded the Japan Society for Lipid Nutrition. His recent electrifying review of the rise in chronic 'western' disorders in Japan, directly related to an altered dietary w6:w3 ratio (~5:1 instead of the traditional 3:1) is having world repercussions [*Felix Letters 94/95 & 96*].

MORE SUNNY NEWS FROM BACK HOME

Don't throw away your sunscreen lotions; they're good for protecting thin, sensitive, or cancer-prone skin of face, scalp, neck. Use broad-brimmed hats too. Also, sunscreen is useful for the first few summer beach excursions. After that, try to build up a body tan *very gradually* (the key words) as your best protection against burns.

Whatever your skin color, try to fill your nonvacation UV ray quota by exposing large hunks of non-sunscreened body surface to outdoor light as often as you can! Older folks and the milkywhite should limit long exposures to mornings or late afternoons, avoiding the most piercing UV rays.

But please get your sunlight quota! Forget about holes in ozone and too much UV light. Evidence is piling up rapidly: many of us are not getting ***enough UVB light*** and *consequently not making enough protective vitamin D.*

Hoary outdated toxicity scares have kept recommendations for supplemental D to piddling amounts--nowhere near adequate for folks who have to be indoors all day, or those who, when they venture out, slather sunscreen all over themselves, fearing sunlight as if they were Dracula.

Recent *Lancet* debates (Feb. 19 & July 1, 2000) focused on whether extremely low or *undetectable serum levels of vitamin D* in Asian Indian immigrants in a UK hospital had anything to do with the fact that they were seriously ill with tuberculosis. Fortunately, the hospital MDs decided it did and proceeded to use and recommend vitamin D supplements!

Redefining Our Vitamin D Needs

In March 14, 1998 *Lancet,* eminent researchers M. F. Holick et al. of Boston Univ. School of Medicine said we need to redefine vitamin D insufficiency. Serum levels usually considered okay were observed in their Boston patients who were losing bone calcium, triggered by too much parathyroid hormone--a huge risk for weak bones and fractures.

The doctors prescribed **"50,000 IU of oral vitamin D_2 once a week for 8 weeks and 1000-1500 mg calcium daily."**

(Carl Reich MD of Canada used 4800 to 8800 IU of vitamin D daily for adult patients, 2400 to 5200 IU daily for adolescents, 1400 IU daily for children until their various ailments improved.)

Pickles/Brian Crane

Holick's patients' serum vitamin D went up, parathyroid hormone levels went down, calcium stopped being leached from bones to fill depleted blood calcium levels.

You see, without vitamin D you don't absorb calcium well from the gut. Parathyroid hormone tries to make up for loss of calcium in tissues by signaling your bones to dump calcium into your bloodstream--a classic 'robbing Peter to pay Paul' situation.

Sunlight & Cellular Energy

Reich always emphasized something that's in physiology texts but glossed over in vitamin D reports. Vitamin D is ***the*** body's source of *ionized calcium.* And guess what? Calcium is useless in all its myriad cell functions *unless* it's ionized. That goes for energy production in mitochondria, the cell's power factories. Insufficient ionized calcium = insufficient energy in every cell of the body.

Think what that means to your muscle strength or your thought processes.

Heavenly Protection

Could vitamin D's considerable anticancer power be related to its ability to energize the immune system? I finally found the paper I'd wanted: "Beneficial effects of sun exposure on cancer mortality," by H. G. Ainsleigh DC (*Preventive Medicine 22:*132, 1993).

Well-referenced reports from the '80s and '90s show direct and indirect protective effects of sunlight vitamin D against cancers of breast, colon, blood, and lymph.

Early studies ('36 and '37) showed that "in those environments and occupations in which skin cancer was increased, other cancers were diminished." Sailors in the US Navy, for instance, "who had extremely high sun exposure, had eight times the expected rate of skin cancer, but only two-fifths the expected rate of internal cancer."

Skin cancers (basal and squamous cell) can be avoided by simple practical measures (sunscreen, hats). They're very amenable to treatment and hardly ever deadly. (By contrast, melanoma, a different, dangerous external cancer, occurs on generally covered parts of the body.)

Still More Reasons to Up Your D's

Do you know anyone over 50 years who has either arthritis, osteoporosis, or high blood pressure, or any combination of the three?
(Realistically, do you know anyone over 50 who *doesn't* have at least one of the three?)

All three are directly or indirectly related to low serum vitamin D.
More studies are accumulating showing all three are *helped* when serum vitamin D is raised much higher than current medical guidelines.

Reinhold Vieth MD says adults require about 4000 IU a day from UV light **and/or supplements,** to get their serum vitamin D up to snuff.

Have I nagged enough already? ❑

THE FELIX LETTER, P.O.B. 7094, Berkeley CA 94707, has been published independently (and irregularly) by Clara Felix since 1981, supported by subscription. Descriptive list of available back issues, plus sample issue, $1. Subscriptions USA & Canada: $12 for 6 issues (approx. one year); $22 for 12 issues (approx. 2 years). U.S. funds only.

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