the FELIX Letter
A COMMENTARY ON NUTRITION
No. 119 2002

THE COURAGE OF HER CONVICTIONS

In 1977 I'd just gotten my BS degree from the Nutritional Sciences department at UC Berkeley, where I'd been a late-blooming middle-aged re-entry. I first met Laura Brainin-Rodriguez when I joined a small group of young students from that department and the School of Public Health who were hungry for information about hot questions that inevitably got swept aside in classes. So we organized a series of student-run, cheerily subversive seminars: "Non-Orthodox Topics in Nutrition." After Sheldon Margen MD stuck his gallant neck out to be faculty sponsor, we were off and running, and from January thru March of '78 about a dozen guest experts expounded on their sometimes radical views. We had high-spirited discussions with each seminar speaker, as well as later in class sessions guided by Dr. Margen; I still cherish the compilation of my fellow-troublemakers' reports, "printed for limited distribution in June 1978," that sits on my bookshelf. We were ahead of our time on a bunch of issues—prophetic, even. (Trans-fats, anyone??)

Laura and I remained friends as she went on to graduate school, earning masters in both Nutrition Science and Public Health nutrition, and an RD to add to her MS and MPH. In 1981, when I put out the first *Felix Letter,* she became clinical nutritionist in the obstetrics/ gynecology department of Oakland's Highland Hospital.

Therein hangs a tale...

Folic acid (or folate, or folacin) is a vitamin cofactor for making your cells' genetic materials—DNA and RNA--so it's rock-bottom basic to a fetus' growth and development.

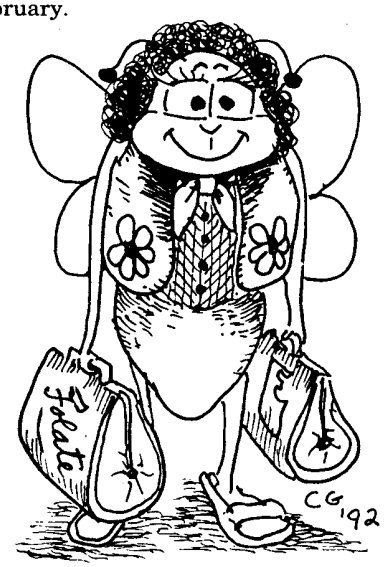
Survey after survey showed poor folate intake to be almost the rule among women and teenage girls. Yet a pregnant woman needed to take in top amounts--not only for her unborn baby, but because her own folate requirements soared as she grew the extra tissues that nurtured and supported the fetus.

Standing Firm

Laura and I had long been in the habit of sharing news on the cutting edge, including more and more studies connecting folate deficiency to an expanding list of disorders that now included birth defects and pre-cancerous cervical dysplasia. Folic acid, she knew, was nontoxic even in megadoses, so she did what came naturally: she stood tough, making sure her clients got plenty. She'd supply supplements herself sometimes, when MediCal wasn't paying for them.

At the same time, her routine talks to the medical staff emphasized again and again how important it was to recognize and deal with widespread folate deficiency, not just in their prenatal patients, but in young women for whom 'the Pill' caused folate requirements to go up sharply.

The fact that Laura is indisputably comely and feminine in no way stops her from going all-out for her principles, even when it means bucking the tide. I suspect this may be a natural heritage from her mom, the late great Helen Rodriguez-Trias, MD, a pediatrician and past president of the American Public Health Assn., who fought for children's health here and in other countries and inspired legions of coworkers. I was awed by the massive tributes at her memorial in San Francisco this February.



During 1981-1983, Laura spurred many Ob-Gyn doctors at Highland to become folate-conscious. Typically, she and they were ahead of the times. This was *not* standard protocol, yet Laura was acting not just on gut feeling but on sound evidence.

A 1982 study had shown that 5 milligrams of folate daily for 3 months prevented cancer in 22 women who had pre-cancerous dysplasia of the uterine cervix, restoring tissues to normal in many of the subjects. (In the placebo group of 25, most women showed worsening dysplasia, and 4 developed cervical cancer at the end of 3 months.)

Studies came along showing that folate supplements given specifically in the very early weeks of pregnancy markedly lowered the incidence of crippling neural tube birth defects-- relatively common and long thought to be genetic.

A Very Bad Move

But that didn't stop the experts on the Food and Nutrition Board of the National Academy of Sciences in 1989 from massacring the previous (1980) RDA for folate. The RDA then had been 400 micrograms (mcg) for all males and females from age 11 on. The 1989 Board chopped the folate RDA in half, to 200 mcg/day for males age 15 and older, lowering it still further to 180 mcg for females age 15 and older (and to a mere 150 for girls and boys age 11-14.)

For pregnant women, the previous 800 mcg/d ***was slashed in half.*** All needs, they wrote, "**can be met by a well-selected diet without food fortification or oral supplementation.**"[1]

This bland assurance was made in the face of one bleak conclusion after another from studies showing folate intake in the U.S. to be too low. It's the vitamin that's especially rich in liver, brewer's yeast, and all manner of leafy greens including seaweed—foods *adored* by a majority of our citizens, especially teen-agers, right? It's also supplied by peas, beans, nuts, seeds and fresh fruit -- not big in the fast-food parade, either.

1. *Recommended Dietary Allowances,* 10th Edition. National Academy Press, 1989.

Before National Academy of Sciences experts could synchronize their newest group-think on nutrient policy, the folly of their earlier decisions on folate came back to haunt them *bigtime*.

Folate, it turned out, was indispensable for preventing your body's normal homocysteine levels from going through the roof. In *FL#109* I wrote:

"Two studies and accompanying editorials in the April [2000] *Am. J. of Clinical Nutrition* cover cradle-to-grave aspects, so to speak – noting more birth defects in babies of mothers whose homocysteine levels stay too high; while the same high levels in the elderly may play a role in brain diseases like Alzheimers. All this in addition to confirmation of homocysteine overload as a big factor in ***heart disease***." (In stroke, too.)

Studies still are piling up. There are strong hints that consuming ample folate may help to prevent *colorectal cancer. Cleft palate and cleft lip* have been added to the list of birth defects attributed to low folate consumption by pregnant women. *Down's syndrome* in the infant might possibly be another outcome. Researchers in a large Australian case-control study wrote in the Dec. 8, 2001 *Lancet* (vol. 358, pp1935-40): "Our results, though unexpected, suggest that folate supplementation in pregnancy reduces the risk of common acute lymphoblastic leukaemia in the child."

Fortification to the Rescue!

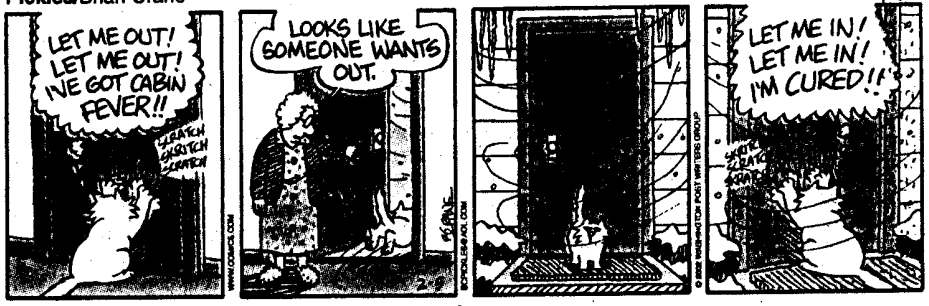
In early 1996 the U.S. Food & Drug Administration issued final rules, first proposed in 1993, requiring U.S. food producers *to fortify all U.S. wheat, rice and corn with 140 micrograms of folic acid per 100 grams (3.5 ounces) of grain, to go into effect starting in 1998.* Today, the FDA estimates the average consumer thereby gains an extra 100 mcg of folic acid a day.

Folate Recommendations Now

The FDA imposed fortification when it became clear too many people were in trouble, despite the aforementioned assurances. New nutrient guidelines, known as "Dietary reference intakes" (DRIs), are being established currently by National Academy of Sciences policy setters. (I see lots of new names on its Food & Nutrition Board—a good sign?) Here are some of the DRIs for daily folate, *(also labeled RDA-AI. AI stands for "Adequate Intake"):*

9-13 yrs (boys & girls): 300 mcg
14-70 yrs (male & female): 400 mcg
During pregnancy: 600 mcg
During lactation: 500 mcg

Pickles/Brian Crane



They've also established "Upper Limits" (UL) for adults, including pregnant women, at 1000 mcg of folate a day from supplements and/or fortified food.

Their rationale: (1) Folate "masks neurological complication in people with vitamin B12 deficiency." [My comment: It's a well-known but rare problem, best solved by assuring ample B12, too.]

(2) "No adverse effects associated with folate from food or supplements have been reported. This does not mean that there is no potential for adverse effects from high intakes. Because data on the adverse effects of folate are limited, caution may be warranted."

The 5-milligram Debate

I'm all for cautious use of supplements, but a December 15, 2001 *Lancet* article (Vol 358, pp2069-73) tells an important story. I described earlier the effectiveness of 5 *milligrams* (mg) of folate (taken daily for 3 months by 22 women) in stopping pre-cancerous tissues of the uterine cervix from becoming cancerous. **5 milligrams (mg) = 5000 micrograms (mcg).**

The UK researchers "investigated the association between maternal serum folate concentration and prevalence of NTD [neural-tube defect] pregnancies..." They knew the risk of having an NTD pregnancy "can be reduced by raising folic acid consumption *around the time of conception...*" [my italics], but the amount had to be determined. Here are their findings, based on how much folate it takes to raise a woman's serum folate to a known protective level against this tragic birth defect:

Increase folate by 0.4mg/day [400 mcg]: reduce risk by ~36%.

Increase folate by 1mg/day [1000 mcg]: reduce risk by ~57%.

Increase folate by 5 mg/day [5000 mcg]: reduce risk by ~85%.

They write: "Folic acid fortification levels should be increased [for the UK]... Additionally, women planning a pregnancy should take 5 mg folic acid tablets daily, instead of the 0.4 mg dose [400 mcg] presently recommended."

They note: "At present, only women who have previously had an NTD pregnancy are advised to take the 5 mg dose. Now all women should be so advised. *Improving the availability of 5 mg folic acid tablets would facilitate this: they should be made available over the counter, without prescription, in all countries, as they already are in Australia."* [My emphasis.]

When Laura pushed and cajoled the Ob-Gyn staff into supplying folic acid supplements to women patients, she was not so much ahead of her time, as acting in the only way a wise and caring nutritionist could. The research to justify this supplementation existed well before 1981-3. It was the medical-nutrition policy-setters who were tragically behind the times. (Do they regret it now?)

With Laura, the courage to stand up for her convictions is as natural as breathing. She did it when she was a feisty young Cal student, and she's doing it still as Outreach & Community Education Coordinator for the Nutrition Services Program of the S.F. Dept. of Public Health.

A few weeks ago, I went to her wedding in San Francisco. She had wanted terribly for her mom to be there, but the illness ran its course too swiftly. One week after Dr. Rodriguez-Trias' memorial, Laura and her wonderful Tony (superb engineer, hot dancer, killer sense of humor!) were married. All of us there--families, coworkers, and friends--wept and cheered.

Laura, what a fine journey our friendship has been! ❐

Pickles/Brian Crane

I'M CELEBRATING!

A 20-gun salute goes to the enduring, farseeing workers in nutrition and medicine who fought for years to add two vital fats, normally found in breast milk, to infant formula, and ***won***. The FDA made the decision last year for the two oils, DHA and ARA (arachidonic acid), both derived from algae (thus vegetarian) by Martek Biosciences. For a number of years, over 60 other countries have made available commercial formula with these Martek oils. These babies have had the benefits of improved visual acuity and mental development, compared with those on regular formula. Now, babies in the U.S. who need supplemental feeding, or whose moms can't nurse, can catch up!

DHA, of course, is the ultra-polyunsaturate omega-3 you get ready-made when you eat fish and shellfish, and it's the most abundant polyunsaturate in your brain, as well as in the retina of your eyes. Males, including baby ones, need substantial amounts in the testes as well.

Along with DHA, your brain has almost equal amounts of ARA from the other essential fatty acid family, the omega-6. Small amounts of ARA are in meat, eggs, and dairy; and your body can make ARA from linoleic acid—the 'parent' omega-6 that's abundant in seeds, grains, nuts, and oils.

Omega-3s have been my 'beat' since 1983, when I first wrote about them in *FLs 14-17*. I remember expressing the hope (in *FL#72* in '93) that some wise biochemists would come up with *vegetarian* DHA, so non-fish-eaters could benefit; and—lo and behold—Martek did just that!

Martek says "Enfamil Lipil" is on drug store and market shelves, and "Similac Advance" will be there starting in April, both supplying DHA and ARA.

Victories like this keep my fires lit.

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MORE ON VITAMIN D SUPPLEMENT SAFETY

As tales of the delightful health effects of tanking up one's bodily reservoirs with vitamin D slowly hit the mainstream, all of you who suspect you may be running on 'low' probably are searching for pointers for safe, effective supplementation. I'm not encouraged by current (Dietary Reference Intakes) guidelines: the new RDAs are mostly lowered since the 1989 ones: 200 IU per day for everyone from birth to age 50, even during pregnancy and lactation. It's better for ages 50-70: 400 IU/day, and 600 IU for over-70 folks.

For infants, the UL for vitamin D is 1000 IU/day. For everyone else, it's 2000 IU. ("UL," or upper limit --"the maximum level of daily nutrient intake that is likely to pose no risk of adverse effects.")

Testing the Waters

Canadian researcher Reinhold Vieth MD has a bone to pick with another new DRI category: "LOAEL – Lowest observed adverse effect level." In the February 2001 *Am J Clin Nutr* (vol 73, pp288-94), he tells about the study he did which he believes refutes the LOAEL's validity. In the Toronto winter, when sunlight sources of the vitamin are puny, healthy volunteers were assigned to take supplements of either 1000 or 4000 IU of vitamin D3 daily for 2 to 5 months.

According to the LOAEL which is set at 3800 IU, volunteers taking 4000 IU should have been in trouble.

Now accepted as the best indicator of your vitamin D status is your serum level of 25(OH)D. The 4000 IU group not only raised theirs from too low [remember, they started the study in winter] to desirable safe levels, but also kept their *blood calcium* from getting too high. Hypercalcemia is the big danger from over-supplementation with vitamin D. Hypercalcemia can't happen when *sunlight* is the source; nature applies a neat cut-off mechanism to nullify excess D from sunlight. (Caution: this safety measure does *not* apply to sunburn!)

When your 25(OH)D serum level drops too low, your parathyroid hormone [PTH] kicks in. That's the signal that starts calcium leaching from your bones, to raise blood calcium—a bad scenario in the long run.

Dr. Vieth says 25(OH)D serum levels below 40 to 50 nanamoles per liter [nmol/L] "are considered to be insufficient. **Because the suppression of PTH is seen as beneficial for bone, many now regard serum 25(OH)D concentrations [of 75-100 nmol/L or above] as desirable. This is the concentration at which PTH approaches a minimum in its relation with 25(OH)D..."** [My emphasis.]

How Subjects Responded

In the folks taking 1000 IU/d, only 8 of the 23 subjects reached 75 nmol/L or higher after three months.

In the 4000 IU/d group, 22 of the 25 achieved these hoped-for 25(OH)D levels.

Vieth says his own experiment and a number of others contradict the results of the *single, 6-person study in* 1984 on which the LOAEL was based. In it, serum calcium was abnormally high in 6 subjects who consumed 3800 IU of vitamin D for three months.

He writes: "...We contend that without data on serum 25(OH)D concentrations, the hypercalcemia observed by Narang et al. was effectively a biological response indicating that they had grossly underestimated the amount of vitamin D in the doses they used. It is unfortunate that [this] study remains the only study cited by the Food and Nutrition Board to support the current LOAEL of [3800 IU/d]."

Still, Let's Be Careful Out There

I respect and concur with Dr. Vieth's passion to insure that healthful levels of this healing vitamin become available to everyone. But here's one obstacle: people absorb and retain vitamin D (from sunlight, food, and/or supplements) in uniquely different ways. For instance, even in his 1000 IU/d group, while some subjects' 25(OH)D barely rose above 40 nmol/L, others reached 100 nmol/L and higher. For the latter people, 4000 IU/d might have been excessive.

So my plea to one and all, based on Krispin Sullivan's work (her vitamin D book should be out this summer), is to *first get your serum 25(OH)D tested; take appropriate supplements for 3 months; then get tested once more and adjust supplements accordingly.* Nag your medical providers for these tests: health care flourishes when it's goosed by wise consumers like you! ❐

DON'T BYPASS BASICS!

The medical mind works in mysterious ways. First came a *Lancet* seminar on **bipolar disorder** in the Jan. 19, 2002 issue (vol 359, pp241-7) in which psychiatrists from leading Berlin and Los Angeles universities covered pathophysiology, genetic factors, management, etc. of manic-depressive disorder. Despite conscientious details and 73 references, no mention was made of Harvard psychiatrist Andrew L. Stoll MD's landmark 4-month study in which patients who got ~10 grams in two doses a day of omega-3 (w3) oils EPA + DHA showed clear improvement over the placebo group (*Archives of Gen Psychiatry,* May 1999) – benefits substantial enough to earn Stoll's group a big NIH study.

As quoted in *FLs 105-6,* Dr. Stoll said the "illness with its high morbidity and mortality places heavy burdens on patients and families," and tends to recur in spite of heavy-duty medications. The *Lancet* authors clearly agree; they see no easy solutions, but are reluctant to report on a safe nutritional treatment. Yet his was based on biochemical concepts *which the authors accept:* namely, that most drugs for bipolar disorder get results *by exerting inhibitory effects on overactive nerve-cell signaling.* EPA and DHA specifically have strong anti-excitatory effects on neural tissues. Stoll chose these fatty acids for his bipolar patients for that reason. He knew the work of Harvard's Alexander Leaf MD that explored similar actions of w3s in *heart* tissues.

Protecting Your Pump

That brings me to another seminar in the Feb. 16, 2002 *Lancet* (vol 359, pp593-603): "Atrial fibrillation: strategies to control, combat, and cure," by Nicholas S. Peters et al. of London. Causes and treatment of this dangerous, sometimes deadly, heart arrhythmia are explored in text and graphs, with 140 citations, none referring to Dr. Leaf's work (Jing X. Kang & A. Leaf, *Lipids* 31: Supplement 1996), or J.S. Charnock's "Dietary Fats and Cardiac Arrhythmia in Primates," *Nutrition* 10:161, 1994.

Destiny in Your Cell Membranes!

I guess I'm single-minded because in 20 years as journalist and newsletter 'mogul,' I'm unable to accept a mind-set in contemporary medicine that's comfortable employing heavy artillery in treatment, but unwilling to explore nutrient-based options.

Doctors forget that the mainstays of medicine since its origins were always nutrients and herbs. This may seem simplistic if not downright quaint compared with hi-tech stuff but, no, there's nothing simple in the exquisite regulatory roles of essential fatty acids in the membranes of every blessed cell in your body. Scientists who explore these actions every day of the week are finding new, remarkable ways in which they affect your body's destiny; e.g., eicosanoids from w6 and w3 fatty acids even signal your genes.

Persons in the habit of taking in too much w6 (from grains, oils, etc.); too little w3 (e.g., fish, shellfish, flaxseed); plus a daily deluge of trans-fats, are asking for trouble in every one of their cell membranes. **I'm describing everyday eating in the U.S. today.**

Isn't it conceivable that cellular mishaps may be expressed in the brain and nerves of a genetically vulnerable person as *bipolar disorder* ? Or, in another individual, as wild, arrhythmic beating of the heart?

I'm truly thankful for the life-affirming advancements in medicine today. They surely will only be strengthened by the inclusion of nutritional medicine. Long ago, when I was a kid and there were no vitamin shops (many vitamins hadn't even been discovered), everyone took cod liver oil, at least in northern latitudes. It was the nasty-tasting unflavored kind, but it helped to prevent rickets. Maybe it prevented other ailments, too; no one knew then that, along with vitamins D and A, the stuff was *loaded* with w3 EPA and DHA.

Folk wisdom: don't knock it, join it!

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I was going to review *Lights Out* by T.S. Wiley with Bent Formby PhD (Pocket Books, 2000), but will do so in *FL#120*. Her premise is startling: we're getting fat and sick because availability of electric lighting for less than a century has distorted sleep-wake patterns that defined us as a species. Meanwhile, I've taken steps to hang drapes in my bedroom that keep out all street light at night, and I'm *trying* to hit the sack earlier. More on this next time. ❐

Illustrations are by the late Clay Geerdes and other artists as noted.

THE FELIX LETTER, **P.O. Box 7094, Berkeley CA 94707, has been published independently, impecuniously, & irregularly by Clara Felix since 1981, supported by heroic subscribers.**

Descriptive list of available back issues, plus sample issue, $1.

Subscriptions USA & Canada: $12 for six issues (~1 year); $22 for 12 issues (~2 years). U.S. funds only.

2002 No. 119

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