the FELIX letter

NO. 22 A COMMENTARY ON NUTRITION 1984

ALFALFA SPROUTS & WISDOM

The pursuit of knowledge in nutrition, as elsewhere, can be both exhilirating and humbling. Many times, I've had my smug little islands of sureness rocked by blasts of fresh information. Looking back a few years, I wince at my ill-concealed skepticism, for instance, when my 80-year-old father insisted that the home-grown alfalfa sprouts I had so lovingly introduced into his diet were the cause of a horrendous red rash which he was having a devil of a time shaking. Alfalfa sprouts were the culprits, he maintained stoutly, because he had never had an outbreak until he began eating them regularly (at my insistence). To prove the point, months after the inflammation had subsided he heroically re-introduced them into his diet, like a true researcher, and lo and behold! the fiery rash reappeared.

I learned recently that monkeys in an experimental study got a severe rash from eating alfalfa sprouts, similar to the inflammation that develops in the disease lupus erythematosus. The toxic substance in the sprouts, canavanine, is believed to be responsible. It is not to my credit that I continued to disbelieve my father until the recent scientific literature confirmed his empirical findings!

Saponins in Alfalfa

The June 1984 ***American Journal of Clinical Nutrition*** (pp 917-929) describes the effects on laboratory rats of ***saponins***, another group of toxic substances in alfalfa and alfalfa sprouts. Previous reports had indicated they might be useful in lowering cholesterol levels in the blood. However, the animal experiments showed that the ability of saponins to bind with cholesterol and cause it to be removed from the blood had an unwanted side effect. Normally, besides being transported in the bloodstream, cholesterol is found in the membranes of all our cells as an integral and protective part of membrane structure. Saponins, however, can bind and interact with this cholesterol, too, and in doing so, disrupt the membranes and break apart the cells. The rats who were fed alfalfa and alfalfa sprouts had considerable saponin-induced damage in their intestinal tissue.

Of course, they were eating alfalfa in far greater amounts than we ever do. Most natural substances we eat contain small amounts of equally natural toxins and/or carcinogens, but our bodies fortunately are equipped with a number of remarkable detoxifying and protective mechanisms to deal with them. I think the implications of the research are that we can enjoy alfalfa sprouts occasionally in modest amounts, but that caution should be used if any intestinal discomfort occurs, or if a red rash appears, related to their intake.

And sometimes we should listen to our fathers. ■

VEGETARIANS' BLOOD PRESSURE

A nice little study from Tel Aviv, Israel, on blood pressure in longtime vegetarians, is reported in the May 1983 ***Am J Clin Nutr***, pp 755-762. Ninety-eight members of the Israeli Vegetarian Association, average age 60 years, were compared with a control group of 98 non-vegetarians of similar ages. All participants were free of diabetes or heart and kidney ailments.

Average blood pressure in the control group: 147 systolic, 87 diastolic. The vegetarians: 126 systolic, 77 diastolic. There was the usual tendency of blood pressure to be higher with age in both groups, but the rise occurred at much lower levels in the older vegetarians.

(In this study, blood pressure was evaluated by these standards: normal was less then 140/90; borderline was between 141/91 and 160/95; and high was more than 160/95.)

Although about 20% of the participants in both groups had histories of hypertension (high blood pressure) in their families, ***only 2% of the vegetarians suffered from hypertension, compared with 26% of the controls.***

While the vegetarians as a group appeared to have better health habits generally (they smoked far less, drank less coffee, and exercised more than the controls), these traits are not associated statistically with a lowered incidence of hypertension, the researchers noted. The key factor, they believe, was the ***higher potassium intake of the vegetarians***. Although their sodium intake appeared to be similar to that of non-vegetarians, their potassium intake was a good deal higher. Also, those with the highest potassium intake had the lowest blood pressure levels.

The researchers point out that an increase in serum potassium has a direct "vasodilating" effect, i.e., it dilates the blood vessels, which tends to reduce hypertension. Potassium in the diet in goodly amounts may have a protective effect against the hypertension-producing properties of too much salt. They quote other researchers who believe that "the high sodium, low potassium diet ingested in Western civilization, combined with a genetic susceptibility, is a principal factor in the genesis and perpetuation of 'essential' hypertension."

What did these long-time vegetarians eat? Here is a typical daily menu:

Breakfast - whole grain bread, fresh vegetables, yogurt or rice porridge. Lunch - vegetable salad, boiled vegetables including potatoes, rice, or beans, pastries, fruits. Supper - fresh vegetable salad with almonds, walnuts, and fruit.

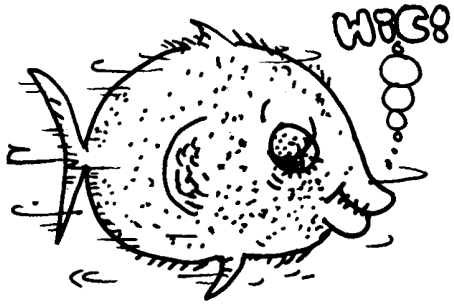
Planning for Potassium

In our own diets, a daily intake of 4,000 or 5,000 milligrams (mg) of potassium is possible with a little judicious planning. Especially if it exceeded our sodium intake, it might offer protection against hypertension. The Israeli vegetarians were ahead in the potassium game, because nuts, fruits, vegetables, potatoes, beans, and whole grains are marvelous sources. A few examples of foods high in potassium:

Milligrams of Potassium in 100 gram (3½ oz.) portions, or portions as described.

* **Soy beans (cooked)**	**- 540 mg**
* **White beans (cooked)**	**- 420 mg**
Yams (cooked)	**- 500 mg**
Potato (cooked)	**- 400 mg**
Millet (cooked)	**- 400 mg**
Winter squash (cooked)	**- 460 mg**
Swiss chard & spinach (cooked)	**- 320 mg**
Broccoli (cooked)	**- 300 mg**
Milk (1 cup 245 grams)	**- 350 mg**
Dates (10)	**- 500 mg**
Banana (½ large)	**- 370 mg**
Canteloupe (¼)	**- 340 mg**
Apricots (3)	**- 265 mg**
* **Walnuts (½ cup shelled)**	**- 225 mg**
For Non-Vegetarians:	
* **Salmon (canned)**	**- 520 mg**
* **Salmon (cooked)**	**- 390 mg**
* **Sardines (canned)**	**- 560 mg**

* Excellent source of Omega 3 essential fatty acids, too!



FISH & POLLUTION

Bonnie Liebman, nutritionist for Center for Science in the Public Interest, tells us in the September 1984 issue of CSPI's journal, ***Nutrition Action***, of the value of a fish diet as a potential preventer of heart attacks, and, at long last, gives our favorite and neglected essential fatty acids — the Omega 3's — their due. The ***Felix Letter***, since No. 14 in 1983, has been emphasizing the benefits of including fatty fish, with their rich Omega 3 content, as a regular part of our diet, but the ***Nutrition Action*** article brings up a telling and painful issue which we must face: ***contamination.***

Agricultural and industrial chemicals such as PCB, DDT, dioxin, dieldrin, and chlordane tend to accumulate in fatty tissues in humans, animals, and birds, and when they pollute our waterways, they end up in the fatty tissues of fish as well. Currently, the species most likely to be tainted, Liebman notes, "include the fatter freshwater fresh, such as carp, catfish, whitefish or chubs, lake trout, buffalo fish, white perch, and American eel.

"Certain migratory species, such as bluefish, mackerel, sablefish, and striped bass, may also pose problems. These fish spend part of their lives in the ocean and part in rivers or estuaries where they can pick up the same chemicals that pollute many freshwater species."

It's important for all of us to be alert to warnings issues by monitoring agencies in our own communities. Liebman explains that because of high PCB levels detected, New York, for example, in June 1984 "issued a sweeping caution against eating more than a half pound per week of fish caught for sport anywhere in the state. Certain species taken from any of 18 New York lakes and rivers should be eaten no more than once a month, and not at all by women of childbearing age or children under 15, the state warned."

Which fish can we eat?

The safest ***freshwater*** fish are trout and catfish that ***are known*** to be raised

on commercial fish farms. Of course, if you're catching your own fish from clean streams and uncontaminated lakes high in the mountains, you're reaping multiple rewards in addition to having no toxicity worries.

Saltwater fish that are safe include ***salmon, flounder, sole, haddock, cod, pollack, grouper, turbot, and herring.***

Ocean perch, halibut, red snapper, and tuna — particularly tuna, which is a large predator living on other fish — should be eaten sparingly because they tend to accumulate mercury — whether naturally or industrially produced.

Shrimp, crab, lobster, clams, oysters and mussels are regularly monitored and presumably allowed on the market only when safe.

Canned, frozen, or fresh salmon seems to have passed all the safety tests and is, of course, one of the best sources of the ultra-polyunsaturated Omega 3 fatty acids, EPA and DHA. Another excellent source, canned sardines, appear to come from all over the world and I'm simply taking my chances and hoping they're free of industrial pollutants. At least, sardines are not mercury accumulators. My own fish intake leans heavily toward salmon (canned or fresh), canned sardines, and commercially grown trout, all readily available in California. I get extra EPA and DHA from teaspoon amounts or capsules of codliver oil. Others are taking capsules of the concentrate from fish oil, MaxEPA, which is marketed by a number of vitamin firms.

A Call to Action

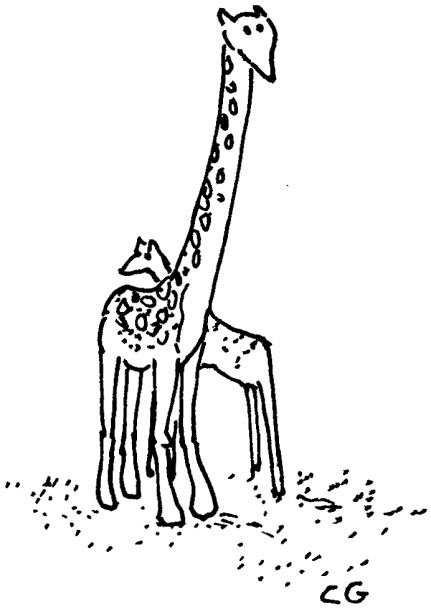
Nutrition Action is well-named. I have begun calling local, state, and federal agencies in an attempt to zero in on the ones primarily responsible for monitoring pollutant levels in fish. I not only want to stay on top of current information on which fish are, or are not, safe to eat, I want those agency folks to know a lot of us out there ***care***! ■

ZINC & PREGNANCY

For a number of years, Lucille Hurley of UC Davis' Department of Nutrition has done yeoman's work to establish the importance of adequate zinc in the diet of pregnant rats and mice and, by inference, pregnant women. Years ago, no one suspected a zinc deficiency was even possible, but now there's evidence that it may be commonplace. Currently, Hurley and her group are studying marginal zinc deficiency in pregnant rhesus monkeys and their infants (***Am J Clin Nutr***, Feb, June and August 1984), in order to provide a basis upon which to assess the effects of ***moderate*** zinc deprivation in pregnant women. In the February 1984 issue (pp 265-280), they note: "In the last two decades, based on a variety of findings, concern regarding marginal zinc deficiency in developed societies has mounted substantially...Increased consumption of highly processed and refined foods may result in diets that are only marginally sufficient in zinc, or even deficient. Pregnant and lactating women and rapidly growing infants and children are especially susceptible to zinc deficiency."

The major effects of marginal zinc deficiency on the mother show up during the 3rd trimester of pregnancy in the rhesus monkeys, in the form of ***inadequate weight gain, reduced plasma vitamin A, anemia, and reduced immune function.*** Cellular immunity and T cell function are particularly sensitive to low dietary zinc.

In terms of the outcome of pregnancy, the effects of marginal zinc deprivation are ***more complications during delivery, lower birth weight for the infant monkeys, and poorer muscle tone and low tissue levels of zinc in the infants at birth.***

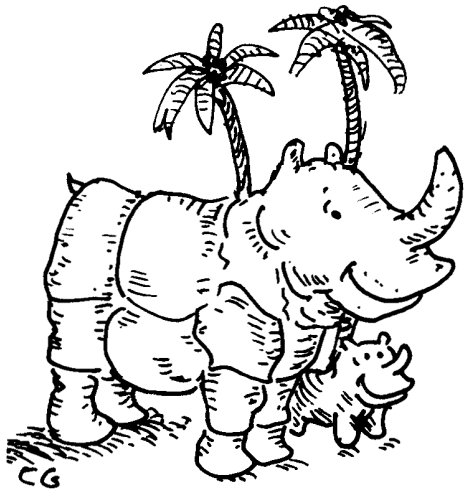


Iron vs Zinc

In ***Felix Letter*** 7, I described an earlier study by a group of doctors and nutritionists, who investigated zinc levels in pregnant adolescents having their babies in a charity hospital in the South and found that the young mothers with the lowest zinc levels suffered the worse complications (toxemia, premature deliveries, low birth weight babies, etc.) They raised the possibility of zinc supplements becoming as routine in pregnancy as dietary iron supplements have become. Unfortunately, the high levels of supplemental iron often prescribed for pregnant

women *have been found to decrease zinc absorption*! In the March 1983 *Am J Clin Nutr*, pp 429-442, the researchers (Hambidge et al.) suggest that a 15 mg zinc supplement daily was probably not enough to counteract the diminished absorption caused by iron which the women in their study were taking. Ironically (hah hah), a lack of zinc has been associated with a type of anemia in pregnancy which does not respond to iron! In other words, by suppressing zinc absorption, heavy doses of iron to prevent one kind of anemia in pregnant women may bring about another kind. The authors state:

The dietary zinc intake of pregnant women in this country, whether from middle or low-income background averages considerably less than ⅔ the RDA (the RDA is 20 mg in pregnancy, 25 mg when nursing, and 15 mg daily otherwise. CF)...*Data derived from this study suggest that a higher intake may be desirable. If this is confirmed, a valid case for routine prenatal zinc supplementation may be established...Prenatal iron supplementation...poses a special problem with respect to zinc nutriture. Attempting to counterbalance a large supplement of one trace metal with a correspondingly large supplement of another may lead to unforeseen complications. Further research will be necessary to determine the optimal approach to this problem.* ■



HYDROGENATION & NURSING

Eight nursing mothers were placed on a diet high in hydrogenated fats for a five-day period, then two days later began another five days with an identical diet, except that no hydrogenated fats or products made with them were used, i.e., no solid shortening, margarine, or partly hydrogenated oils *(Am J Clin Nutr,* May 1984, pp 778-786). The results: their milk reflected the diet quite unmistakably. A high percentage of *trans*-isomers of fatty acids were found in the milk less than a day after the mothers began eating the hydrogenated fat diet with its high proportion (12%) of *trans*-fatty acids. Soon after the mothers switched to diets without shortening, margarine, or partially hydrogenated fats, the *trans*-fatty acid content of their milk quickly dropped.

Trans-isomers of fatty acids are unnatural impostors produced by the commercial hydrogenation (hardening) of oils. They can worm their way into cell membranes and hamper the activity of the normal fatty acids in the membranes. They are known to interfere with vital cell functions and the production of prostaglandins, which serve as important local hormones. They DO NOT belong in the diet of mothers and babies. Pregnant and nursing women should read package contents carefully; most crackers and cookies contain "vegetable shortening," which is a storehouse of *trans*-fatty acids. ■

GIFT WRAPPING

On the subject of babies, I was touched and charmed by a recent news item describing a report to the U.N. International Children's Emergency Fund (UNICEF) by two pediatricians from Bogota, Colombia, Edgar Rey and Hector Martinez, who have worked out a simple and cheap way to permit very tiny but otherwise healthy infants to survive. In a technique they call "packing," a baby weighing less than 4.3 pounds at birth *spends day and night wrapped against its mother's breast* instead of in an incubator.

"Packing" provides the baby with warmth from the mother's body; and breast milk, with its great protection against infections, is always readily available. The mother's heartbeat and bodily movements, as well as her affectionate handling and soothing voice, are benefits the infant couldn't get even in the best of incubators.

The pediatricians gave the results of a two-year study in Colombia with over 500 low-weight babies who were "packed." In a two-year period before the technique was initiated, using conventional methods, half of all infants under 4.3 pounds died. With packing, nine out 10 survived.

How logical it seems, and what a tribute to pediatric common sense and maternal devotion! ■

Illustrations are by Clay Geerdes and other artists as noted.

***The Felix Letter* is $10 for 12-issue subscription in U.S. and Canada, 6-8 issues each year. Set of back issues $15, sample copy $1. Please make checks to Clara Felix, P.O. Box 7094, Berkeley, CA 94707. Send self-addressed stamped envelope for Index to previous issues.**