

The FELIX Letter

A COMMENTARY ON NUTRITION

NO. 19

MARGARINE: KILLING WITH THE CURE

The new chemical process at the turn of the century, that transformed oils into solid shortening and margarine, was hailed innocently enough as a boon to housewives, bakers, and the growing packaged food industry. Hardening ("saturation" or "hydrogenation") was accomplished by adding hydrogen atoms to "unsaturated," liquid fatty acids, i.e., oils. Seed oil industry and agriculture expanded, turning out both liquid and solidified oils which "kept" better than butter, lard, or poultry fats.

After 1960, sales of "polyunsaturated" margarine and oil rose sharply, in response to widespread, well-publicized encouragement by medical and nutrition authorities. Alarmed by the still rising epidemic of heart attacks and strokes, the medical experts had seized on recent studies showing statistical association of heart and artery disease with very high serum cholesterol levels. A new medical dietary policy evolved, directed towards decreasing these levels. The eating of foods high in cholesterol was to be kept to a minimum, but the main push was towards decreased consumption of "hard" or "saturated" fats in butter, cream, whole milk, cheese, eggs, meats, and lard, and at the same time increasing the use of oils and margarines, thought to be rich in polyunsaturates that were known since 1930 to be essential in our diet.

The policy remains to this day as the standard preventive and therapeutic approach, from the dietary standpoint, in cardiovascular disease. By now, several decades of epidemiological evidence on its effects have given conflicting results, but even as the debate expands, heavy promotion of the heart-saving virtues of oils and margarines continues.

Weird New Fats

It may come as a surprise to heart specialists (although it shouldn't!), but as long ago as the 1940's careful researchers were finding reason to suspect the innocuousness of hydrogenated products. Strange and disturbing distortions of the

fatty acids that form the basic substances of fats and oils were showing up, revealed by new analytic technology.

For one thing, an unsaturated linkage of carbon atoms could move to an unexpected place on the molecule ("isomerization"). For another, the molecule's shape itself changed. The normal doubled-up "cis" formation (Latin for "on this side of") took on an unnatural, stretched-out, "trans" shape (Latin for "across").

Could these funny products of hydrogenation cause harm? Perhaps not, if they were simply used as fuel for energy by the body. But what of the newer information that hinted of a powerful role for fatty acids in cell membrane structure and function, in blood lipids, in cholesterol control?



Luckily for all of us, science has its share of stubborn souls who doggedly pursue lines of investigation, even when they run counter to powerful interests. Five years ago, I heard rumors of harmful substances in margarines. When I began exploring the research literature a year ago for the *Felix Letter* series on fatty acids and prostaglandins (issues 14-17), the alarming implications of the work of these stalwart investigators led me to an inescapable conclusion: while margarines and shortenings may come in handy for greasing sled runners, they are by no means safe to eat.

Cause for Concern

Here are significant findings of long-term investigations, some of which began in the 1950's and 60's.^{1,2,3}

- So-called polyunsaturated margarines, as well as saturated shortenings, are loaded with unnatural *trans* fatty acids — up to 47% in margarines and 58% in shortenings!

- Most of the "polyunsaturated" salad or cooking oils have been "lightly" hydrogenated, too. This is done purposely to get rid of the highly unsaturated essential fatty acid, alpha-linolenic (our friendly Omega 3!), in order to "improve flavor stability." As a result, the oils contain as much as 17% *trans* fatty acids.

- After we digest them, *trans* fatty acids readily take up residence in blood lipids, muscles, liver, spleen, kidney, adrenals, and the heart! They are also deposited in adipose tissue, which serves as a reservoir to supply these fatty acids to all tissues.

- The amount of *trans* fatty acids found in tissues is directly proportional to the amount in the diet. Although most research has been done with rats, chickens, and pigs, the few studies with humans indicated we incorporate the 'phony' fatty acids into our tissues just as readily. In some tissues, they comprise as high as 14% of the total fatty acids!

- The incorporation of *trans* fatty acids into cell membranes significantly disrupts normal cellular functions. For example, a key role of the two essential fatty acid families, Omega 6 and Omega 3, is to become activated molecules known as *prostaglandins*. The prostaglandins serve as "local" hormones that regulate cellular activities, which, in turn, affect all bodily processes.

- The *trans* fatty acids are "impostors" which sneak into cell membranes as if they belonged there. However, not only can they NOT become activated cell directors (i.e., prostaglandins), they interfere with the ability of nearby normal fatty acids to do so.

(Since the right prostaglandins can protect against heart attack or stroke by preventing spasms and "sticky" blood platelets in arteries, the presence of 'machine-made' fatty acids that interfere with this protective action can be deadly.)

Some scientists are suggesting that the intake of hydrogenated oils is strikingly correlated worldwide with the incidence of coronary heart disease! F.A. Kummerow¹ of the University of Illinois has found that *trans* fatty acids in heart tissue *interfere with energy available to the heart muscle*, which could be crucial during stress or an actual heart attack, when the heartbeat can increase to 280 contractions per minute — a rate that creates a tremendous demand for energy.

- A number of researchers imply that similar distortions of normal cell function caused by the invasion of *trans* fatty acids may create other pathological conditions, including cancer.

- It has been known since 1957 that in pregnant rats, *trans* fatty acids readily pass through the placenta and are incorporated into fetal tissues. The human 'experiments' on this are the *unwitting ones taking place every day, each time a pregnant woman eats food prepared with margarine, shortening, or 'lightly' hydrogenated oil!*



A Major Oversight

The flawed thread I find running through most research in lipids and prostaglandins is that, even where there is some recognition that hydrogenation of U.S. oils may have produced a Frankenstein monster, in the form of unnatural fatty acids that currently lurk in tissues of young and old, there is still *almost no awareness of the other tragedy caused by hydrogenation. It is the wholesale removal of a family of nutrients we must have before we can be healthy: the Omega 3 fatty acids!* [See Felix Letters 14-17 for Donald Rudin's brilliant work to alert us to this calamity.]

We need them for normal brain and eye structure and function. They also form prostaglandins, which serve effectively to

balance the ones produced from the Omega 6 fatty acids. Laboratory rats may do okay without them (although I'm not convinced of this, since one experiment showed they flunked their IQ test!) BUT HUMANS AND OTHER PRIMATES DON'T.

Without good reason except economic expedience, for many years they have been selectively removed from all commercial food oils. *There has been no protest from the nutrition and medical establishments*, who, without human studies to back up their view, have casually dismissed any human need for Omega 3 fatty acids, even though their essentiality as a nutrient had been established, along with that of the Omega 6 group, more than fifty years ago.

There's No Excuse!

The making of hydrogenated oils was begun innocently enough, but there's no innocence left! Medical authorities have had good scientific evidence available to them for over 20 years that unnatural molecules created from natural oils are insinuating themselves into delicate cell membranes in our bodies and interfering with healthy functions in subtle and pervasive ways.

They have also known for at least 15 years that our remarkable cell "activity directors," the prostaglandins, can only be made in the cells from natural, non-distorted Omega 6 and Omega 3 fatty acids in our diet. They should have been sensitive to the very real possibility that great numbers of unnatural ones could create havoc in our health.

Instead, they have blandly insisted, along with nutrition policy makers, that "polyunsaturated" margarines and oils (made up of about 50% and 17% *trans* fatty acids each) will protect us from heart disease!

I find it outrageous. It makes far more sense to completely eliminate commercial margarine, shortening, and any other hydrogenated products from our diets, substitute *very modest* amounts of butter*, lard, mutton or poultry fat, and cut down greatly on intake of most commercial oils.

The oils we should be eating instead, and feeding to our children, are *linseed, walnut,*

- * *Trans* fatty acids are seldom found in natural foods, with a major exception: ruminant animals, such as cows and sheep, contain them, as a result of bacterial action in their rumen, which converts some of the dietary fatty acids to the *trans* isomer. These *trans* fatty acids, which are found in the fat and in the milk of ruminant animals, are not, however, the same configuration as the ones produced by manmade hydrogenation. F.A. Kummerow¹ notes that the consumption of these natural *trans* fatty acids by relatively rural populations of Southern and Eastern

wheat germ, or fish oils. Only a tablespoon or two daily for adults is needed, except in specific therapeutic programs. If the oils can be gotten unrefined, so much the better.

Foods naturally high in Omega 3 oils should be emphasized in our diets: *fish, walnuts, soybeans, flax seeds (linseed), wheat sprouts, wheat germ, and green leafy land and sea vegetables.* I learned recently that *beans, especially common kidney, navy, white Northern, pinto, red, and lima,* contain decent amounts. All the above are also sources of linoleic, the important Omega 6 fatty acid.

The phony fatty acids in today's oils and margarines are plastic products of a short-sighted technology. Any "convenience/flavor improvement" over traditionally eaten linseed oil, butter, poultry fats, or lard, is illusory. They are like dangerous impostors in a B-movie who take over a town (our cells), tie up its inhabitants, (the REAL fatty acids), and use it as a base for criminal forays (cellular damage)!

The "heroes" who will drive them out and restore our cells to health are the good, natural foods we were meant to enjoy, courtesy of a wise and bountiful Nature. ■



1. *Geometrical and Positional Fatty Acid Isomers*, Enken and Dutton, editors. The American Oil Chemists' Society, Champaign, Illinois, 1979.
2. *Progress in Lipid Research*, Vol. 20, Ralph T. Holman, editor, Pergamon Press, New York, 1982.
3. Martin, Wayne, The beriberi analogy to myocardial infarction. *Medical Hypotheses* 10: 185-198, 1983.

Europe, where hydrogenated fats are seldom used, is associated with much lower death rates from coronary heart disease than the "British, Germans, Swedes, and Finns, who, like Americans, take in large amounts of hydrogenated fat," along with the natural *trans* fatty acids from dairy products. Dairy products have been a valuable food for man for thousands of years; the heart attack and cancer epidemics began only in this century.

PHASES FOR FUN

From time to time, readers alert me to ingenious approaches to health problems that are well worth sharing. A retired Berkeley engineer tells me he can improve muscular performance by learning to take advantage of "an observed periodicity in the body's response to stress." It's simpler than it sounds! Two phases of exercise are involved. Choosing a modestly stressful exercise, he performs it slowly and gently, just long enough to produce a mild stress. A typical "phase 1" activity for him would be five to seven pushups.

He then lies down and rests until a "deep relaxation occurs." Although the time may vary by a minute or so, he says the restful feeling occurs consistently at 8½ minutes, for most individuals who have tried the method. *He believes this represents the time it takes for stress-resisting hormones to be produced by the adrenal glands and enter the circulation.*

Going with the Flow

At this point, he rises and performs the exercise as vigorously and as long as possible. Always, he and those he has coached in the technique find that the second phase of exercising is accomplished with greater ease than the first, and can be maintained much longer than if it had been performed without the resting interval! Using the same pattern each morning and evening, my engineer correspondent tells me he continues to be "vigorous and energetic" in his late 70's. Men and women of all ages can use the technique with exercises of their own liking, such as sit-ups, step-ups consisting of repeated stepping up on a stool and down, barbell exercises, jumping rope, etc. (I suspect some will utilize the rest interval for prayers or meditative thought, since it's boring to just lie there!)

As an engineer, he attributes the benefits to a "resonance" phenomenon, in which stress is applied "in phase with a natural frequency of the body." Knowing one's own resonance pattern in response to muscular stress will permit better use of the energy produced from gently stimulated adrenals.

In another issue, I'll describe how my correspondent harnesses this energy (1) to reduce fatigue during periods of intense study; and (2) to improve his eyesight!

On a personal note, I've begun using the two-phase approach to sit-ups, and it works! It occurs to me that it might be a useful approach to running. When the weather gets warmer and I can lie down on the grass near the running track, after Phase One, and wait for my adrenals to start churning, I'll give it a whirl and report on the results. Science joggeth on! ■

TELL ME IT'S NOT TRUE!

(--or Salem, or Camels,
or Players . . .!)

I don't know when it began — probably after World War II — but I've belatedly discovered that the sedate slicks which represent American womanhood are filled with cigaret ads. The 100th anniversary issue of *Ladies' Home Journal* in January 1984 shook me badly: Eight full- or double-page cigaret ads (plus a giant one for vodka)! It was like finding my mother selling raffle tickets to a bawdy house.

I can understand more racy mags, like *Cosmopolitan*, sprinkling inducements to smoking in between articles on mapping your "G" spot or stealing someone's husband; but I was unprepared for the reality of finding them in such respectable ones as *McCall's*, *Family Circle*, *Woman's Day*, *Redbook*, *Bride's*, even *Mademoiselle*! Of course, they're plentiful in the high-fashion journals: *Vogue*, *Harper's Bazaar*, *Vanity Fair*, *Glamour*, etc., and in the newer publications: *Ms.*, *New Woman*, *Essence* ("the magazine for today's black woman"), *Working Woman*, *Working Mother*, and so on. *Good Housekeeping* and *Parents* are among the worthy exceptions in the women's field.

Outside of religious or health publications, there ARE only a handful of major national magazines that don't take ad money from the tobacco empire. (*Hustler* and *Mother Jones* — an odd couple — qualify.) Nevertheless, the presence of cigaret ads in traditional women's magazines, ostensibly devoted to bettering the health, lives, and looks of American women, denotes a special quality of cynicism on the part of the publishers.

Cynicism and *greed*, or — who knows, in these days of multinational corporate intertwinings — maybe the tobacco giants *own* many of the women's magazines now!



Equality of the Sexes

The effects of enthusiastic use of cigarettes are charted with unusual clarity, because before World War II, lung cancer, emphysema, and throat cancer were singularly *male* disasters, but with the great postwar rise in female smokers, a surge of these ailments appeared for the first time in large numbers of women. (To this day, the tobacco industry maintains there is no scientifically verified link.) In 1963, 6588 American women died of lung cancer. The estimated total this year (1984) will be 36,000, according to the American Cancer Society.



'Extras' for Women

In addition to readily succumbing to "male" ailments, women smokers have come up with a few of their own. Dr. Warren Winkelstein Jr., of the University of California at Berkeley's school of public health, reported in April 1984 that at least six research projects now confirm a strong link between *smoking in women and cancer of the cervix*. Smoke, tarry substances, and other burned products from cigarets enter the lungs, are picked up by the blood circulation, and carried to all parts of the body. Apparently, the cervix, which forms the neck of the uterus, is lined with the same type of delicate squamous epithelial cells as the lining of the lungs and is also vulnerable to cigarets' cancer-causing effects. Winkelstein says.

• A National Institute of Health panel reported in April 1984 that after menopause, women smokers are especially subject to severe demineralization of their bones (osteoporosis), commonly leading to fractures of hip and spine which don't mend well.

- It's also well-documented that pregnant ladies who smoke have more premature babies, babies of low birth weight, and babies with more health problems than those of non-smokers.

Selling the Dream

Nevertheless, the forces conspiring to make smoking look good to women are pretty hard to beat. We were still somewhat innocent about its effects in the 1940's, when the screen's bolder ladies joined male stars in lighting up, inspiring legions of fans to follow suit. Since then, we've had generations of billboards to solidify the trend by demonstrating that beautiful young people need only to *inhale*, to achieve what the rest of us shnooks only dream about: athletic triumphs, passionate couplings, and clean, fresh-tasting breath! The industry seems to intensify its advertising efforts in direct ratio to the mounting evidence of its products' culpability.

Beauty & the Cigaret-Beast

The REAL irony is finding cig ads back-to-back with beautification rituals in the women's magazines. Never mind the litany of health disasters: have you observed what happens to the **FACES** of women smokers, somewhere into the fourth decade of life? I can only describe it as a *shriveling*. Seldom does one see firm, rosy complexions. Instead, the face and mouth appear crumpled. It happens to men, too, but women seem more visibly fragile in this respect. I believe the same wasting that takes place routinely in the mouths of smokers and leads to *accelerated loss of bone and gums that support the teeth* is also responsible for the destruction of collagen and other firming and plumping substances natural to the skin.



LYNN SEED SEZ:
OMEGA 3 IS GOOD
FOR THEE!



By the end of a few decades of joy-filled smoking ("Share the spirit. Share the refreshment!" "The Taste of Success!" "Spoil Yourself with Satin!" "Players go places!" "You never had it this fresh!") the ad models may expect a 'long-in-the-tooth' look to go with their prematurely corrugated countenances. At this point, in desperation, they will redouble their use of cosmetics — the *other* great mainstay of magazine advertising revenue. It's a can't-lose situation — for the magazines, if not for the smokers.

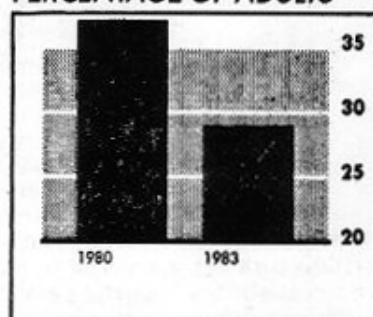
I wish there were some way to change the required health warning on cigarette packages and ads. Actually, it was manipulated to become an inducement to smoking, particularly to teenagers and 'macho' types. What better way is there to appeal to a sense of daring or create a "what the hell, you only die once!" mystique than by the statement: "...Cigarette Smoking Is Dangerous to Your Health." An appeal to vanity would be a lot more effective: "The Surgeon General Has Determined That Cigarette Smoking Will Wrinkle Your Skin and Loosen Your Teeth By the Time You Are 40."

Panic on Madison Ave.!

A brightening piece of news: despite heroic effort by the tobacco, advertising, and publishing industries, *cigarette sales are strongly declining in the U.S.* and finally so is the lung cancer rate, at least in men age 35 to 44. In 1980, 37 percent of adult men and women in the U.S. smoked. By the end of 1983, as the chart shows, it had dropped to 29 percent and is still dropping sharply. Incidentally, heart attacks, another smoking-related illness, have also been declining.

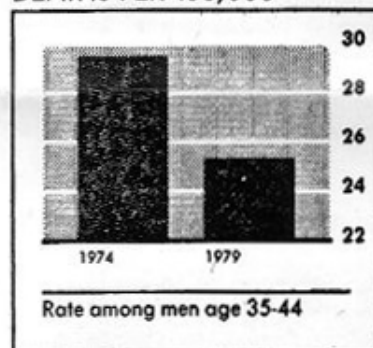
FEWER SMOKERS

PERCENTAGE OF ADULTS



LUNG CANCER

DEATHS PER 100,000



To the good folks who smoke but don't want to any more, the message is a good one: millions have been able to quit since 1980, and if the press weren't hungry for the big cigaret ad bucks, we'd be reading thousand of encouraging accounts of how it can be done with minimum discomfort. Maybe we can yet drive the tobacco moguls to their knees and make the growers plant *flax* for linseed oil instead! ■



The Felix Letter is \$10 for 12-issue subscription in USA. Back-issue sets \$13, sample copy \$1. Please make checks out to Clara Felix, P.O. Box 7094, Berkeley, CA 94707