the FELIX letter

A COMMENTARY ON NUTRITION

No. 7 MAY 1982

SHAPE OF FAT

Ladies, do you tend to be pear-shaped or are you built more like an isosceles triangle standing on its point? It's all governed by heredity, but the excess fat you accumulate in these characteristic patterns may predict your chances of getting maturity-onset diabetes, according to Ahmed H. Kissebah and his colleagues at the Medical College of Wisconsin (*Science,* 5 Feb. 1982). In a study of 52 women, twenty-five of the obese women had excess weight distributed predominantly in the neck, chest, arms, and waist (the 'upside-down triangle' types); eighteen had lower-body obesity, mostly in their hips, buttocks, and thighs (the 'pear-shapes'); and nine women were of normal weight.

The obese women, aged 20 to 40, had been judged healthy in physical exams prior to the study, though they were from 40 to 100 percent overweight. Nevertheless, all twenty-five of the 'inverted-triangle' women showed abnormally high values on glucose-tolerance tests given by the Wisconsin researchers. They also had significantly high levels of both fats and insulin in their blood plasma. The pear-shaped chubbies and normal-weight women showed none of these abnormalities. On the basis of these tests, Dr. Kissebah determined *that 60 percent of the obese 'inverted-triangle' women had preclinical diabetes, and 16 percent clinical diabetes.*

The Wisconsin researchers had confirmed in a 1980 study of 15,000 white, overweight American women that upper-body obesity was more common among diabetic women than lower-body obesity; this time, the study involved fifty-two women who were believed to be *healthy.*

Which body type are you, and what are the criteria for obesity? Well, a rough screening tool is the ratio of waist size to hip size, for women only. *A ratio below 0.7 indicates lower-body obesity.* Example:

$$\frac{\text{Waist, Inches} — 27}{\text{Hips, inches} — 41} = 0.66$$

A ratio of 0.7 may be considered normal. Example:

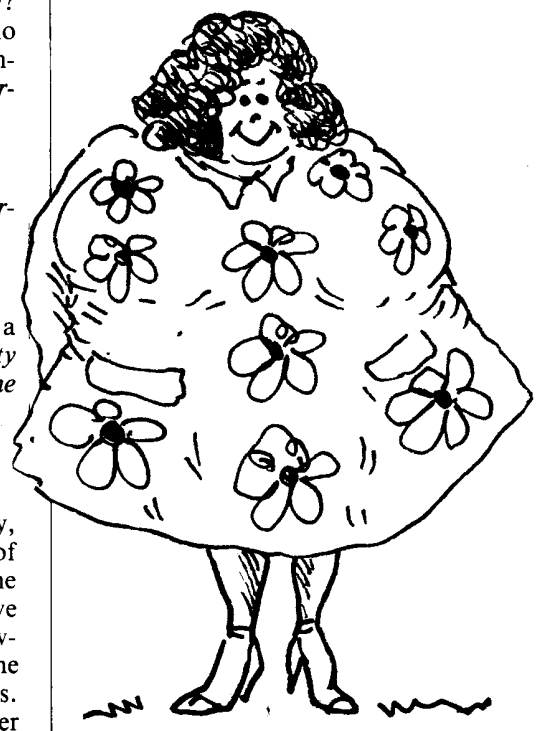
$$\frac{\text{Waist, inches} — 27}{\text{Hips, inches} — 38.5} = 0.7$$

Upper-body obesity is suggested by a ratio above 0.7, with *greater possibility of diabetes susceptibility where the ratio is above 0.85.* Example:

$$\frac{\text{Waist, inches} — 34}{\text{Hips, inches} — 39} = 0.87$$

Men cannot be classified in this way, since the usual masculine pattern of weight-gain is around and above the waist. Interestingly, the twenty-five women with upper-body obesity showed high levels of the male hormone testosterone compared with others. Testerone has been found in other research to increase the incidence of diabetes, and obese men are commonly more prone to maturity-onset diabetes than obese women. Thus, in these women, the hormone may have been a contributing factor in both the male-like deposition of their body fat and the high incidence of diabetes.

In the March/April *FELIX LETTER* I explored the possibility that both obesity and pre-diabetic abnormal glucose tolerance may respond to increased dietary sources of chromium, especially if the food chromium is combined with niacin and certain amino acids into a molecule called "glucose tolerance factor"-chromium. Brewers yeast is still the best known source, and may represent an important (and inexpensive) means to improve glucose tolerance, normalize chronically high insulin levels, increase levels of HDL-C (the protective cholesterol carriers in the blood), and, with circumspect dieting, achieve and maintain weight loss. ■

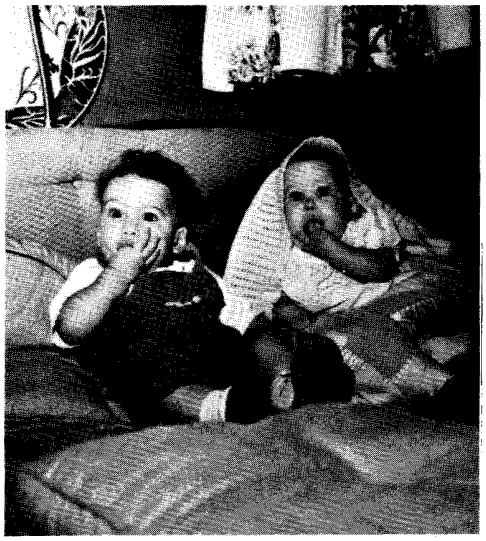


MORE ON SALT

Readers may have noted that *TIME* magazine (cleverly taking its cue from "A Taste of Salt" in the February *FELIX LETTER,* no doubt) devoted the cover of its March 15, 1982, issue to "Salt: A New Villain?" in which a giant salt shaker is shown dispensing through the holes in its top a variety of long-beloved foodstuffs, including the all-American hotdog. . . now tainted with the shadow of culpability in the rising incidence of hypertension (high blood pressure). I recommend the comprehensive, excellent article because it makes a clear case for the need for drastic reduction in our present salt intake. It also offers practical ways to eat tastefully by using imaginative seasonings and redeveloping a palate for delicate flavors long bludgeoned by salt.

For me, the article has a certain wry aspect. *TIME*, long a voice for corporate America, is nipping at one of its own club members, the great food conglomerates, who, long ago, discovered that one way to make money was to outdo the competition in sweetening the sweetenable and salting the saltable . . . until we have become, from cradle to grave, a nation of sugar and salt junkies. Only in the mid-1970's did the industry finally quit adding salt to baby foods, having ensured by then that millions of kids would be hooked. Now, *TIME* is adding its voice to those in government, medicine, and nutrition pleading with the industry to label foods for sodium content so people can see what they're getting; to offer more low-salt or no-salt products; and to just plain reduce the sodium in processed foods.

It tickles me to no end to see *TIME* using both good journalism to make low-salt eating "in," plus the clout of its giant readership, to establish a climate where industry will feel pressure to cooperate. Implicit in the *TIME* story, however, and openly stated in a few paragraphs, is the somewhat anti-corporate concept that rather than waiting for the processed-foods industry to cry *Mea culpa!* and emerge in its chaste new garments as protector of the nation's arteries, we can exercise an option. Usually located on the perimeter walls of supermarkets are foods in their natural or close-to-natural state: fresh fruits and vegetables, milk, eggs, fresh meat, fish, and poultry. Together with beans, whole grains, unsalted nuts, herbs, spices, and a few well-chosen bakery items, they offer no threat to us saltwise and permit us the intriguing privilege of determining whether it is a particular FOOD we enjoy, or the SALT that formerly dominated its flavor in its canned or packaged form. ■



I'm devoting the remainder of this issue to samples of new research information in the scientific literature that offer promise in several areas of health problems. This information may or may not reach clinicians, depending on their reading orientation. It's unlikely anyway that many doctors or clinics will seize upon this knowledge and implement it with lightning speed, since it is still in the conjectural stages, and may remain there for the next 30 years. Nevertheless, simple nutritional adjuncts are shown in these studies to have major potential therapeutic value. When you're talking nutrition, you're talking food or food supplements; we are no longer in a rigidly bound area of medical protocol, but in one where we have an opportunity to exercise our judgment.

EXIT STOMACH CANCER

The November 1981 issue of *The American Journal of Clinical Nutrition* provides some interesting speculation on the possible cause of the high stomach cancer rate in Japan and its decrease in the new generation of Japanese who live in Hawaii and the U.S. mainland. A change in diet, logically, would be a reasonable area of investigation.

"A proposed mechanism by which dietary factors could induce carcinogenic changes in the stomach is the formation of nitrosamines from dietary precursors (nitrates, nitrites, and secondary amines)." Nitrites and secondary amines can actually unite in the stomach to form nitrosamines, which are a potent carcinogen. The traditional diet in Japan includes large amounts of pickled vegetables, in which the preserving process increases the nitrite content. Dried/salted fish, another traditional food, has a very high content of secondary amines. Together, they may contribute to the formation of dangerous nitrosamines in the stomach and eventual cancer. In the study, it was found that Japanese born in Hawaii do eat less of these foods and have less stomach cancer.

The Good Vitamin C

In the U.S. diet, nitrites come not only from the amounts added in the curing of hot dogs, ham, and lunch meats (to protect against botulism, etc.), but from the conversion of *nitrate* to *nitrite* by normal bacteria *in our mouths.* Nitrates occur in vegetables, and the amounts can get quite high because of routine use of fertilizers containing nitrates. The answer is not to stop eating vegetables, *but to make sure to include some source of vitamin C with each meal.* This can be fresh fruit, supplemental vitamin C, or both. The comforting news from the study is that *ascorbic acid (vitamin C) can block the formation in the stomach of these carcinogenic nitrosamines.* In the study, a higher consumption of vitamin C was associated with a much lower incidence of stomach cancer. The authors speculate that vitamin C, as an antioxidant vitamin, may also protect tissues against the "promotion stage of carcinogenesis." Its ability, however, to keep the villainous nitrosamines from even forming in the stomach makes a good case for its routine daily inclusion in any sensible cancer-preventive program. ■

ZINC & PREGNANCY

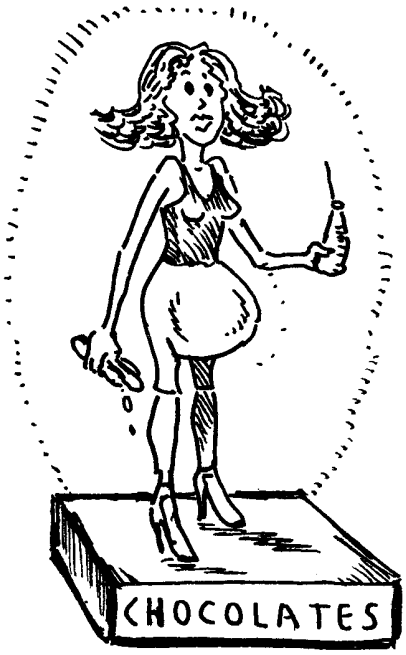
Still in the same journal issue is a report on 272 pregnant adolescents who received prenatal care and delivered their babies in a charity hospital in the South. The researchers found variable but generally low levels of the essential trace mineral, zinc, in the girls, whose average age was 17½. In the course of pregnancy, a number of the young women with significantly lower zinc values developed the potentially dangerous complication of high blood pressure (hypertension) and toxemia. Also occurring among those with lower zinc levels were a greater number of premature deliveries and low birthweight infants, and more cases of prolonged labor.

Animal studies have clearly shown adequate zinc to be necessary for successful gestation and healthy young. It had long been thought that zinc deficiency was not a problem for pregnant women in Western countries, until a number of fairly recent investigations showed that low serum zinc during pregnancy was associated with congenital malformations in human infants and long and difficult labor (parturition) for mothers.

Teen-age Diet

The doctors and nutritionists participating in the Southern charity hospital study had no control over the diets of the teen-age girls, who were not their patients. They were simply investigating correlations between zinc levels and course of pregnancy. Zinc is most available and more readily absorbed in the more expensive animal foods such as seafoods, eggs, meat, fish, and chicken, although beans, nuts, and whole grains are good sources. The girls were poor and on less than an optimal diet, but the researchers note that at the charity hospital it was "customary to prescribe a supplement which contains little zinc."

The contents of the prenatal tablets, presumably chosen by the hospital's obstetrical department, show the kind of illogical approach towards supplementation that has caused me to sigh many times: minimal C, no vitamin E; plenty of iron but no chromium or selenium and essentially no zinc, as the researchers note, which, of course, made it possible to study the consequences of marginal zinc deficiency on the course of pregnancy.



Having noted that the growing fetus accumulates two-thirds of its zinc in the last three months of pregnancy — which in effect would pre-empt much of the mother's slim supply of the mineral if she were on a suboptimal diet — the authors make this gentle plea:

> *It is intriguing to speculate on whether such a decline in plasma zinc values can be lessened or circumvented by assuring adequate zinc intake by supplementation in pregnancy. Perhaps such supplementation would place less stress on the maternal organism, just as Lund and Donovan demonstrated for iron administration, bringing about a better hematological picture throughout pregnancy in the iron-supplemented group as compared with one not receiving iron. Iron administration has now become routine in pregnancy.*

Let us hope the obstetricians follow suit with regard to zinc. ■

AN ANSWER IN NUTRITION

A beautiful example of the way in which replenishment of a food factor may change the course of a potentially cancerous condition, appears in the January 1982 *Am. J. of Clin. Nutr.* For three months, two groups of young women received either a placebo or 5 milligrams of folic acid each day in a double-blind study (neither the women nor researchers knew which group took which pill until the end). All the women had mild to moderate dysplasia of the uterine cervix, a condition usually discovered from PAP smears and characterized by abnormal cell growth. When untreated, it worsens and may eventually progress to cervical cancer. Spontaneous recoveries without treatment are rarely seen, and these only in patients with very mild dysplasia.

In the placebo group of 25 young women, only one patient with very mild dysplasia became normal. Ten women showed worsening dysplasia, with four developing cervical cancer at the end of the three months.

In the folic acid group, there was a general trend toward improvement in the cell picture, and five out of the group of 22 showed complete recovery, four having returned to normal from previously moderate dysplasia. *Not one developed cancer.*

The Pill

Some studies have shown an association of abnormalities in cervical cells with the longterm use of oral contraceptives. The 47 young women chosen were all users of oral contraceptives. They initially also showed lower folate levels (a form of folic acid) than normal. It has been suggested that cervical cells may have greater nutrient requirements during periods of rapid cell division induced by frequent hormonal stimulation. *The "pill" thus may increase folate requirements in cervical cells, because folate is needed for all cell divisions and normal tissue growth.* The authors comment that:

> *Deficiency of a specific nutrient could be devastating to a cell undergoing mitosis [cell division] . . . Purposeful augmentation of certain nutrient pools might therefore be beneficial to cells that are subjected to frequent cycles of hormonal stimulation.*

A therapeutic trial using folic acid for one to three months, they suggest, might be considered in selected cases of women with early cervical cell abnormalities. More studies, they add, are needed "regarding cervical dysplasia *and nutritional approaches to its management.*" [Emphasis mine. CF]

Folic Acid in Nature

In the rich tropical jungles that were early man's homeland, folic acid deficiency would be unthinkable because it exists in every leaf, in green vegetables, in nuts, whole grains, beans, and seeds. Modern diets are almost universally low in folates, and the slow realization is hitting some clinicians that folate deficiency may be manifesting itself in a number of insidious ways, ranging from macrocytic anemia to severe emotional disorders. Folic acid can heal cervical cells and keep them from becoming cancerous. If it's first-class nutrition miracles you're seeking, I can't offer a better one than that. ■

DIABETES & CARBOHYDRATES

Diabetic diets are changing, and I'm glad. Only five years ago, when I was still a student in U.C. Berkeley's nutrition department, the textbook for our Therapeutic Nutrition class had me tearing my hair out. It was *Modern Nutrition in Health and Disease,* Fifth Edition, edited by Drs. Gooodhart and Shils, and the margins in the chapter on "Diet in the Treatment of Diabetes Mellitus" by G.F. Friedman, M.D. were filled with my outraged scribbled comments. "Not one word about what *kind* of carbohydrate a diabetic should eat!!" "He talks about 'liberalizing carbohydrate intake' for diabetics, but doesn't say if he means brown rice or Twinkies!" In the diabetic diet lists of breads and cereals, no distinction was made between whole grains and processed products. The loss of quantities of vitamins and trace minerals, as well as natural fiber, from highly processed grains appeared to be a matter of no consequence in the medical management of diabetes.

Fiber & Blood Sugar

The slow awakening began a few years ago with the big hoopla about fiber and its magical effects in cholesterol reduction, prevention of bowel cancer and diverticular disease, and so on. Supplementing the usual diabetic diet with viscous fibrous substances such as guar gum and pectin, was found to yield useful therapeutic results in lowering postprandial plasma glucose levels. The research on dietary fiber and diabetes is expanding rapidly, and the November and December 1981 issues of *Am. J. Clin. Nutr.* present studies from regions of the world as far apart as California and India. Both groups of researchers decided that instead of expecting diabetic patients to ingest the large amounts of isolated fiber necessary to achieve improvement in blood glucose, it might be useful *to see if fibrous foods themselves would be similarly beneficial.* The Stanford Medical School group found that "boiled rice" and whole kernel corn, used as the carbohydrate portion of a total meal, produced plasma glucose and insulin responses similar to those achieved with fiber supplementation. The group in India, using a somewhat different methodology, found that garbanzo beans ("Bengal gram dal") or red kidney beans ("rajmah"), eaten separately, were very effective in reducing postprandial glycemia.

Both groups were enthusiastic that foods rich in fiber may help to ease the diabetic's burden, and felt that more research is warranted on the effects of different kinds and combinations of fibrous carbohydrates. The Indian researchers remark:

> *It is interesting that physicians of ancient India used to treat diabetes mellitus with barley and green gram (Charaka Samhita and Sushruta Ayurveda published more than 2000 years ago).*

We've Come Full Circle

A strange sort of progress, this! Having separated our grains for about 150 years into the starch portion, which we eat, and the fibrous portion filled with vitamins and minerals, which we feed to livestock, we are discovering that the diseases that may have their major origins in this very separation, are benefited by a rejoining of these separate parts! Maybe the next edition of Drs. Goodhart and Shils' textbook will have a revised chapter on diet and diabetes in which carbohydrates are identified as to wholeness and fiber and trace mineral content; and the connection between diabetes and the loss of these nutrients — now largely ignored — is enthusiastically explored. ■

The Felix Letter is published monthly except December. $10 for 12-issue subscription in U.S.A., checks made out to Clara Felix, Box 7094, Berkeley, CA 94707.