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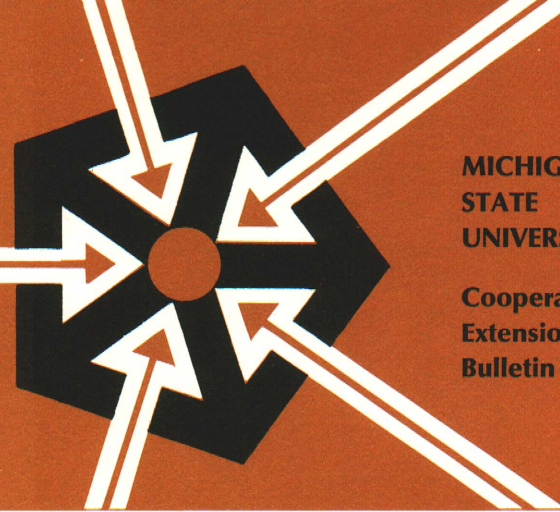
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NUTRITION VIEWPOINT

On the Everchanging Field of Human Nutrition

MICHIGAN
STATE
UNIVERSITY

Cooperative
Extension Service
Bulletin 740



Vitamin E—Fact or Fiction?

Number 1.
in a series

More than ever before, people want answers to questions about their health. They want to know how to prevent heart disease, obesity, diabetes, arthritis. They want to know exactly how nutritious and safe their food is.

These are all complex topics—with no simple answers. This goes for Vitamin E too—another food topic much in today's news. Overnight experts are writing about it in newspapers, magazines and books, and discussing it on TV talk shows. With but a few exceptions, an accurate story is not being told.

Why the sudden interest?

For one thing, many unproved claims are being made that it can prevent and cure certain diseases in humans. Vitamin E is an essential nutrient. It performs these following known vital functions in the human body: 1. It is needed for red blood cell formation and maintenance of the cell wall structure (it does this by preventing polyunsaturated fats in the body from becoming rancid.) 2. Along with vitamin C, it improves absorption of iron.

For reliable information on this essential nutrient and its role in human health, we have asked Dr. Olaf Mickelsen, professor of nutrition at MSU, to analyze recent claims in light of current nutrition research.

CLAIM—Vitamin E is useful for treating sterility, miscarriage and other reproductive and sexual disorders.

CURRENT FINDINGS—For many years after its discovery in the early 1920's vitamin E was regarded as the one nutrient associated with reproduction. This contention was based on a laboratory discovery that a severe deficiency of vitamin E caused rat fetuses to undergo resorption. A small amount of vitamin E given to rats as late as one third through pregnancy resulted in normal full-term pregnancies. Based on these results, numerous clinical studies were performed on women, especially those

who had a number of spontaneous abortions. Results of this research suggested that vitamin E may facilitate normal pregnancy only for those women with a history of spontaneous abortions. For any other reproductive cases, vitamin E therapy has not been proved effective.

CLAIM—Vitamin E is useful in treating muscular dystrophy.

CURRENT FINDINGS—Through continued laboratory research, scientists observed muscle abnormalities resembling muscular dystrophy in animals with a severe deficiency of vitamin E in their diet. Then, as studies with human patients progressed, early reports in the 1940's indicated that vitamin E, (taken by mouth or injection over long periods), improved muscle condition in patients. Further studies did **not** support the earlier enthusiastic reports. Today there is not even a suggestion that Vitamin E therapy is of any benefit in treating muscular dystrophy.

CLAIM—Vitamin E is useful in preventing and treating heart disease.

CURRENT FINDINGS—In 1945, studies at the Minnesota Agricultural Experiment Station sought to determine whether any heart disturbances in dairy calves were associated with a vitamin E free ration. Previous studies indicated that lack of vitamin E did not affect reproduction in cows and goats, and the Minnesota study confirmed this finding. However, after being fed the vitamin E deficient ration for a year or so, a number of cows died very suddenly. Heart abnormalities observed in cows while still alive suggested that the sudden deaths were caused by heart failure. Cows on the same ration, but supplemented with vitamin E, showed no heart disturbances.

Largely on the basis of these results in cows, a number of physicians prescribed vitamin E for patients who had had recent heart attacks. Here again,

enthusiastic reports from a few physicians praising vitamin E in the prevention and treatment of heart attacks tended to discourage further studies to verify their exaggerated claims. To date, these claims still have not been verified by scientific studies.

Most physicians today do not prescribe any therapy that lacks scientific proof of effectiveness. There is simply no accepted evidence today that vitamin E prevents or cures heart attacks in humans other than through the benefits of a diet providing adequate amounts of all nutrients.

CLAIM—Vitamin E will slow down aging and prolong life, act as a tranquilizer, dissolve blood clots and heal severe burns.

CURRENT FINDINGS — Any recommendations along this line are still based largely on theory. None of them has been clinically proved—as in the case with all of the claims listed above.

CLAIM—It is necessary to supplement the daily diet with vitamin E, wheat germ oil, or wheat germ.

CURRENT FINDINGS — The average adult in the United States is unlikely to develop a deficiency of vitamin E unless he completely removes it from his diet. When this removal has been done experimentally, it required from 2 to 3 years before any biochemical changes in the blood occurred which were even suggestive of a deficiency. It should be emphasized that this deficient diet had to be treated by a very elaborate and expensive procedure to remove all the vitamin E. Infants in some areas of the world—primarily the Middle East—where severe protein and calorie deficiencies exist, develop a type of anemia which responds favorably to vitamin E. However, there is no indication that vitamin E is effective against the kinds of anemia found among U. S. infants.

Much emphasis is placed today on

diets high in polyunsaturated fats (corn oil, margarine, etc.) for controlling high blood cholesterol. Foods rich in these fats are valuable sources of vitamin E. A good example is wheat germ oil. (Milling removes the wheat germ from the grain to enhance the keeping quality of white flour.) To many people, wheat germ—the fat-containing part of the wheat kernel—is vitamin E. It is a rich source of both vitamin E and polyunsaturated fats.

So are oils such as corn, cottonseed, soybean and safflower (and salad dressings, margarines and products made from these oils). With the increasing emphasis on these fats, margarine manufacturers are retaining a greater proportion of them in their products.

SOURCES OF VITAMIN E

The following foods are good sources of vitamin E:

Vegetable oils—wheat, soybean, corn, peanut, coconut

Vegetable shortenings; margarine

Whole grain cereals—oatmeal, brown rice, yellow cornmeal

Wheat germ

Green leafy vegetables—turnip greens, kale, parsley, spinach, lettuce

Seeds and nuts—almonds, filberts, sunflower seeds, walnuts

Foods eaten regularly from these natural sources—in well-balanced diets containing all nutrients—can go a long way in supplying the recommended daily allowance of 30 International Units (IU). This amount is considered "generous"—far above a minimum requirement. In a typical diet, over half (64%) of the vitamin E comes from salad oils, shortening and margarines, about 11% from fruits and vegetables and about 7% from grain products. It is also present in egg yolk and in very small amounts in meat.

How It May Be Lost

Supplementation may be needed in the case of carelessly planned meals or habitually unbalanced eating habits. There is some loss of the vitamin in food processing and storage. Even deep freeze storage doesn't completely prevent destruction. But ordinary cooking—except deep fat frying—does not reduce the vitamin E in foods.

For those who enjoy the taste and texture of wheat germ, it may be an economical supplement since one ounce supplies 6 IU's.

But pills furnishing typically 400 IU's are wasteful when only 30 IU's a day are recommended and the vitamin has no proved curative powers even at this high level.

Remember this about vitamin E: it is essential to your health, but your body doesn't need much. On the basis of current knowledge, you won't endanger

your health if you insist on taking vitamin E in wasteful amounts; more likely you will endanger your budget.

Recommended Daily Dietary Allowance of Vitamin E*

	Vitamin E Activity International units
Infants†	5
Children 1-6 years	10
6-10 years	15
Adult Males 10-14 years	20
14-18 years	25
18-75+ years	30
Females 10-14 years	20
14-75+ years	25
Pregnancy	30
Lactation	30

*Foods and Nutrition Board, National Academy of Sciences, National Research Council

†Because infants have low tissue concentrations of vitamin E, those infants receiving a cow's milk formula require a supplement. The Food and Drug Administration has proposed that infant foods given as a complete or partial substitute for human milk be supplemented with vitamin E.

ACKNOWLEDGEMENT

Our guest contributor, who received his Ph.D. in biochemistry from the University of Wisconsin, has published over 100 scientific articles in biochemistry and nutrition. He is an active member of numerous professional societies and associations, associate editor of *Nutrition Reviews*, past associate editor of the *Journal of Nutrition*, co-author of the book, *The Biology of Human Starvation*, and author of *Nutrition Science and You*. He participated in the White House Conference on Food, Nutrition and Health as a member of the Voluntary Action Panel and the Panel on Food Packaging and Labeling.