

# The NUTRITION REPORTER™

THE INDEPENDENT NEWSLETTER THAT REPORTS VITAMIN AND MINERAL THERAPIES

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## “Gamma” Tocopherol Attracts Interest, But Researchers Favor “Alpha” Form of Vitamin E

Gamma tocopherol, a form of vitamin E, can quench certain types of free radicals, according to a new study. However, leading vitamin E researchers believe alpha tocopherol, the most common type of vitamin E sold in supplemental form, offers the most benefits—and is effective against many other types of radicals.

In experiments using the blood of human volunteers, Stephan Christen, PhD, of the University of California, Berkeley, found that gamma tocopherol was more effective than alpha tocopherol in minimizing peroxy nitrite radical damage to fats, and only gamma tocopherol was able to permanently neutralize nitric oxide radicals. Both types of free radicals are produced during inflammation.

In addition, Christen reported that high doses of alpha tocopherol limited the body's utilization of gamma tocopherol, which is the most common form of vitamin E in the American diet. He also suggested in his article in the *Proceedings of the National Academy of Sciences* (April 1, 1997;94:3217-22) that people take supplements that contain both alpha and gamma tocopherols.

A widely distributed Associated Press news article reported that, based on Christen's research, the alpha tocopherol form of vitamin E was “harmful in large doses.”

Top vitamin E researchers bristled at the thought.

“There is no data that shows vitamin E toxicity in humans given vitamin E supplements,” Maret G. Traber, PhD, also of the University of California, Berkeley, told THE NUTRITION REPORTER. She added that the high amounts of gamma tocopherol in the U.S. diet were an artifact of high corn and soybean oil consumption.

Many people consume these oils with the hope of reducing their cholesterol levels, Traber said. But the gamma tocopherol leaves the blood so quickly that cholesterol becomes more prone to oxidation.

Furthermore, all that gamma tocopherol doesn't seem to protect Americans against coronary heart disease, according to Angelo Azzi, PhD, of the University of Bern, Switzerland.

In contrast, a large body of evidence accumulated over the past 50 years points to the safe and effective use of alpha tocopherol in the prevention and treatment of coronary heart disease. Last year, a study of 2,002 people found that taking 400-800 IU of alpha tocopherol daily reduced the incidence of heart attacks by 77 percent.

That may be partly because the body's tocopherol-

binding protein, which controls vitamin E absorption, preferentially selects for alpha tocopherol over gamma tocopherol and synthetic forms of the vitamin, said Azzi.

Christen said that news reports emphasizing a danger with alpha tocopherol were “totally overblown.”

“I never said that alpha tocopherol supplementation was harmful. The [Associated Press] reporter tried to push me in that direction,” he explained to THE NUTRITION REPORTER.

“Supplementation with alpha tocopherol has been shown to be quite safe and, in some studies, to reduce the risk of getting heart disease. What we are saying is that a supplement that contains both major forms of vitamin E—that is, alpha and gamma tocopherol—may actually be more useful,” he added.

But Harvard University's Meir Stampfer, MD, who has studied vitamin E, didn't like the idea of adding gamma tocopherol to conventional vitamin E supplements. “I wouldn't want to take a supplement like that,” he told the Medical Tribune News Service (March 31, 1997). □

### Vitamin E Superior to Drug Treatment of Alzheimer's Disease

Researchers have suspected that free radicals promote the brain damage that becomes Alzheimer's disease. That idea has gained new support with a study showing that vitamin E, which quenches many types of free radicals, can actually slow the progression of Alzheimer's.

A team of researchers and physicians, headed by Mary Sano, PhD, of Columbia University College of Physicians and Surgeons, New York, compared the effect of vitamin E (alpha tocopherol) to selegiline, a drug used in the treatment of Parkinson's disease. Sano and her colleagues gave 341 patients either vitamin E, selegiline, a combination of both, or a placebo for two years.

Patients taking 2,000 IU of vitamin E daily—a relatively high dose—delayed the onset of severe Alzheimer's by almost eight months over untreated patients, according to Sano's article in the *New England Journal of Medicine* (Apr 24, 1997;336:1216-22). Their decline was marked by losing the ability to perform basic activities (e.g., eating, grooming, and using a toilet), being institutionalized, or dying.

Patients taking selegiline had a seven-month delay in the progression of their disease. But those who took a combination of vitamin E and selegiline slowed the

Continues on next page

development of Alzheimer's by only five months, suggesting that the two compounds were somewhat antagonistic.

Neither vitamin E nor selegiline appeared to improve thinking abilities in the Alzheimer's patients.

"Patients treated with alpha-tocopherol alone or combined with selegiline required significantly less supervision than those receiving placebo....Both selegiline and alpha-tocopherol delay functional deterioration, particularly as reflected by the need for institutionalization, and should be considered for use in patients with moderate dementia," wrote Sano and her colleagues. □

## Thiamine Good for Mental State

Taking a daily 50 mg thiamine (vitamin B1) supplement can do wonders for a person's mind and mood.

David Benton, PhD, of the psychology department, University of Wales Swansea, gave either a daily thiamine supplement or placebo to 120 female university students. To measure thiamine levels, he assayed levels of transketolase and other enzymes affected by the vitamin.

After two months, the women taking thiamine were more clearheaded, self-composed, and energetic, and they also had faster reaction times. The vitamin had no effect on memory, however.

"The novel aspect of the present findings is that the response took place in subjects who were, according to traditional criteria, receiving a sufficient thiamine intake" Benton wrote in *Psychopharmacology* (Jan 1997;129:66-71).

Last year, Benton reported that 22 percent of college-age men and 20 percent of college-age women had either a marginal or deficient intake of thiamine, suggesting that a large segment of the population may be psychologically impaired because of poor nutrition.

"If we are concerned about sub-clinical vitamin deficiencies, then thiamine is one vitamin that should attract initial attention," Benton stated. □

## L-Carnitine Proves Better than Drug in Chronic Fatigue Syndrome

Supplementation with L-carnitine, a component of protein, can dramatically improve the health of people suffering from Chronic Fatigue Syndrome (CFS), according to a study conducted at Mercy Hospital and Medical Center, Chicago.

Audius V. Plioplys, MD, gave either the drug amantadine or L-carnitine to 28 men and women for eight weeks. After this time, the amantadine and L-carnitine were switched for eight weeks, so all patients received both medications at some point during the study.

Amantadine is an antiviral drug sometimes helpful in treating pain associated with multiple sclerosis. L-carnitine has been used to treat lethargy and fatigue in a number of neurological diseases. It is needed to transport fats into cells where they are burned for energy.

The difference between amantadine and L-carnitine was striking. After eight weeks, patients taking 3 grams of L-carnitine daily improved in all 18 of the psychometric tests used to assess CFS, and the improvement was significant in 12 of the tests. Only one patient stopped taking L-carnitine because of abdominal pain and diarrhea.

In contrast, only 15 of the 28 patients were able to tolerate amantadine for a full eight weeks, and none of them had any improvement in symptoms.

"Of particular significance is the observation that the degree of improvement seen with the use of L-carnitine was associated with the degree of severity of CFS symptoms at the time of starting this medicine," Plioplys wrote in *Neuropsychobiology* (Jan 1997;35:16-23). "The patients who were most ill with CSF were those that improved the most with L-carnitine. Of note also is the fact that depression also significantly ameliorated with the use of L-carnitine..." □

## Beta-Carotene Turns on Immune Cells, Fights Cancer and Infections

A team of British researchers has identified a key way in which beta-carotene turns on the immune system to protect against cancer and infection.

Monocytes, a type of white blood cell, have a surface protein that can distinguish cancer cells from normal ones, according to David A. Hughes, PhD, of the Institute of Food Research, Norwich, England. When the protein, called MHC II, notices a cancer cell, it signals other immune system cells to attack it. But if monocytes don't have enough MHC II proteins, the cancer cell goes unnoticed.

That's where beta-carotene comes in, according to an article by Hughes and his colleagues in the *Journal of Laboratory and Clinical Medicine* (March 1997;129:309-17). He gave 15 mg of beta-carotene daily to 25 healthy men for almost a month. The amount was comparable to eating three or four carrots daily.

By analyzing blood from the subjects, Hughes determined that beta-carotene increased the number of MHC II proteins on monocytes, which would make them more effective trackers of cancer cells.

He also found that beta-carotene increased the subjects' production of tumor necrosis factor alpha (TNF-a), which helps kill cancerous and virus-infected cells. □

## Fruits and Vegetables, Plus Low Fat Foods, Reduce Blood Pressure

Switching to a diet high in fruits and vegetables can lower blood pressure, and combining fruits and vegetables with a low-fat diet can lower blood pressure even more.

Lawrence J. Appel, MD, MPH, of Johns Hopkins University, Baltimore, and other members of the Dietary Approaches to Stop Hypertension (DASH) trial, placed 459 people on various diets to determine how eating habits affected blood pressure. The average initial blood pressure

was 131/85, but 133 subjects had moderate hypertension, averaging 140/90.

All of the subjects began with a three-week "control" diet low in fruits, vegetables, and dairy products, and with fat content typical of the American diet. They were then randomly assigned to receive one of three diets for the next eight weeks: (1) a continuation of the control diet with few fruits and vegetables, (2) a diet rich in fruits and vegetables, and (3) a "combination" diet rich in fruits, vegetables, and low-fat dairy products and low in saturated and total fat.

On average, people eating diets high in fruits and vegetables had a 5.5 point decrease in systolic blood pressure (the upper number) and a 3.0 point decrease in diastolic blood pressure (the lower number). People eating the combination diet benefited from an additional drop of 2.8 points in systolic and 1.1 point in diastolic blood pressure.

The most dramatic decreases in blood pressure occurred in the patients with hypertension. Their systolic blood pressure dropped by an average of 11.4 points and their diastolic blood pressure dropped by 5.5 points, according to an article in the *New England Journal of Medicine* (April 17, 1997;336:1117-24).

The two groups eating fruits and vegetables consumed substantially more potassium and magnesium, but the same amount of sodium, as the control group. However, Appel and the other researchers were reluctant to attribute the decrease in blood pressure to any single nutrient.

People on the combination diet ate nine servings of fruits and vegetables daily. □

## Switching to Low-Fat Diet May Reduce Breast Cancer Risk

Women with large areas of dense breast tissue, visible on mammograms, have an above-average risk of developing breast cancer. But eating a low-fat diet for just two years can reduce the amount of this dense tissue and might lower the risk of breast cancer.

Norman F. Boyd, MD, of the Ontario Cancer Institute, Toronto, and his colleagues recruited 817 women who had dense tissue in more than 50 percent of their breast area. About half of the women were asked to adopt diets lower in fat and higher in complex carbohydrates (e.g., fruits, vegetables, and grains) than that of a control group.

Two years later, follow-up mammograms indicated that women eating low-fat diets had an average decrease of 2.4 percent in breast size and 6.1 percent decrease in dense breast tissue. In contrast, women eating more fat had a 0.3 percent increase in breast size and a 2.1 percent decrease in dense tissue.

"The observed effect of the intervention after two years...is small...and is unlikely to be associated with an important reduction in the risk of breast cancer," Boyd wrote in the *Journal of the National Cancer Institute* (April 2, 1997;89:488-96). "However, if differences in the rate of

change of density...persist over several years, substantial differences between the groups in the extent of mammographic densities would be expected." □

## High Dietary Calcium Protects Against Kidney Stones

The long-held medical belief that calcium causes kidney stones is all wrong, according to a new study.

Kidney stones are composed largely of calcium and oxalate, and physicians have long recommended low-calcium diets to patients at risk of developing stones.

Gary C. Curhan, MD, ScD, of the Harvard School of Public Health tracked 91,731 women for 12 years. Those who consumed large amounts of calcium daily, mostly from milk and cheese, were 35 percent less likely to develop kidney stones than were women who consumed relatively little of the mineral.

Oxalate, found in leafy green vegetables may be the real cause of kidney stones, according to Curhan. "One possible explanation...is that high calcium intake reduces oxalate absorption and subsequent urinary excretion of oxalate by binding oxalate in the gastrointestinal tract," he wrote in *Annals of Internal Medicine* (April 1, 1997;126:497-504).

However, women who took calcium supplements turned out to be 20 percent more likely to develop kidney stones, possibly because the supplements were not taken with oxalate-containing foods. Curhan's advice for supplement takers: take calcium supplements with meals, so they more closely resemble the calcium found in foods. □

## Fish Eaters Have Healthier Hearts

A 30-year study has found that men who eat fish once or twice a week have a lower than average risk of dying of a heart attack.

Martha L. Daviglus, MD, PhD, of the Northwestern University Medical School, Chicago, led a team of physicians and researchers that analyzed data from the Chicago Western Electric Study, which began in the late 1950s. The study included 1,822 men who were generally overweight, had high blood pressure, elevated cholesterol, smoked tobacco, and regularly drank alcohol.

During the study, 430 men died from coronary heart disease, most due to heart attacks. The risk of death from heart attacks and other types of cardiovascular diseases was lowest for the men who ate the greatest amount of fish.

"The men who consumed 35 grams or more of fish per day had a 42 percent lower rate of death from myocardial infarction than the nonconsumers..." wrote Daviglus and her associates wrote in the *New England Journal of Medicine* (Apr 10, 1997;336:1046-53). The amount adds up to about 9 ounces per week.

Daviglus speculated that the benefits were related to the specific combinations of amino acids found in fish. □

## Quick Reviews of Recent Research

### • Elderly need vitamin B12 and folic acid

A study of 52 patients with Alzheimer's disease, 50 nondemented hospital patients, and 49 healthy subjects living at home found all of them to have comparable blood levels of vitamin B12 and folic acid. However, homocysteine levels (a highly accurate indicator of folic acid deficiency) were higher among the Alzheimer's patients, suggesting that they had greater needs for the vitamins. The researchers noted that "significant vitamin B12 and folate deficiency is also a substantial problem in nondemented elderly patients."

Joosten E, et al., *Journal of Gerontology Series A—Biological Sciences and Medical Sciences*, 1997;52:M760-M79.

### • Vitamin C eases exercise stress

Rigorous exercise generates free radicals as metabolic byproducts and increases oxidative stress. When subjects were given 1 gram daily of vitamin C, measurements indicated that they suffered less oxidative stress.

Alessio HM, et al., *International Journal of Sport Nutrition*, 1997;7:1-9.

### • Tomatoes may lower lung cancer risk

Researchers at Columbia University, New York, compared 93 people with lung cancer to 102 healthy subjects. All of them had comparable levels of beta-carotene and alpha-carotene, but the lung cancer patients had significantly lower levels of lycopene, found in tomatoes. People with the lowest lycopene levels had three times the risk of developing lung cancer, according to data presented at the annual meeting of the American Association of Cancer Research. In a subgroup of African-Americans, people with the lowest lycopene levels were eight times more likely to develop lung cancer than those with high levels of the nutrient.

Charnow JA, Medical Tribune News Service, April 14, 1997.

### • Margarine and heart disease risk

In a recent analysis of eating habits and disease from the ongoing Framingham study, researchers found that margarine, but not butter, was linked to an increased risk of coronary heart disease. "These data offer modest support to the hypothesis that margarine intake increases the risk of coronary heart disease."

Gilman MW, et al., *Epidemiology*, 1997;8:1440-9.

### • Citrus flavonoids reduce oral cancer risk

Diosmin and hesperidin, two of the antioxidant flavonoids found in citrus, were used to treat oral cancers in laboratory rats. The frequency of tongue carcinomas was reduced by 62-77 percent. Each supplement reduced the risk of oral cancer by itself and also in combination.

Tanaka T, et al., *Recent Advances in Gastroenterological Carcinogenesis*, 1996:1167-70.

### • Antioxidants lengthen life span of mice

A daily supplement of beta-carotene, vitamins C and E, selenium, zinc, and rutin extended the life span of mice, but

only if the vitamins were given when the mice were young. Mice that began receiving the antioxidants at two and nine months of age lived about 20 percent longer. Mice receiving the antioxidants at 16 and 23 months of age, toward the end of their natural life span, didn't have any apparent benefits.

Bezlepkin VG, et al., *Mechanisms of Ageing and Development*, 1996;92:227-34.

### • Inositol may help in obsessive-compulsive disorder

Inositol, a nutrient related to the B vitamins, has been shown helpful in depression and panic disorder. Israeli doctors treated 13 obsessive-compulsive patients with 18 grams of inositol daily for six weeks. After treatment, most of the patients had lower—that is, improved—scores on the Yale-Brown Obsessive Compulsive Scale, a measure of the disorder's severity. The authors concluded that "inositol is effective in depression, panic, and obsessive-compulsive disorder, a spectrum of disorders responsive to selective serotonin reuptake inhibitors."

Fux M, et al., *American Journal of Psychiatry*, 1996;153:1219-21.

### • Fish oils can diminish white blood cell activity

Although the omega-3 fatty acids are essential for life and beneficial to the heart, large amounts of them can impair the body's response to infection. In a study of laboratory rats, large amounts of dietary fish oils reduced phagocytosis, the ability of white blood cells to capture bacteria. The fish oils also lowered production of hydrogen peroxide, which white blood cells use to kill bacteria.

Costa Rosa LFBP, et al., *Biochemistry and Molecular Biology International*, 1996;40:833-42.

### • Cancer cells produce own free radicals

Free radicals are known to mutate, or damage, DNA, sometimes resulting in cell changes that lead to cancer. Cancer cells appear to produce large numbers of their own free radicals, which signal cells to keep growing. Antioxidants, such as N-acetylcysteine, can block these signals and might inhibit the activity of some types of cancer cells.

Irani K, et al., *Science*, 1997;275:1649-52.

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