



Health & Wellness



Vitamin E Tocotrienols: The Latest & Greatest Nutrient Discovery



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As we age, we become subject to the chronic diseases of aging—some suffer sooner than others, some suffer worse than others. Our fate seems to lie in the interaction between our genetic tendencies and our lifestyle (our diet, exercise, sleep, stress and toxin exposures). Many of us work hard at trying to overcome some genetic vulnerabilities and unforeseen or unavoidable environmental toxic exposures by compensating with healthy habits. In addition to regenerative sleep, stress reduction, and regular exercise, our office recommends a healthy diet of organic vegetables, fruits, beneficial fats, lean proteins and dietary supplements when needed. People vary in their efforts to accomplish this compensation. Some may not be aggressive enough and some make no effort at all to support their well-being. Some people lack knowledge in "self-help for health" and some have genetic vulnerabilities or exposures that are very powerful and difficult to overcome.

Medical researchers certainly see the need to develop treatments for chronic health conditions. There are hundreds of pharmaceuticals targeted at osteoporosis, osteoarthritis, autoimmune conditions, cancer, cardiovascular disease, diabetes, neurodegenerative diseases and others. There are also researchers who study natural products—molecules that come from plants, animals, insects, dirt, etc... also looking for treatments that can prevent or treat these conditions. These may be molecules we don't routinely get in our diets or can't get in high enough quantities even in a healthy diet. The last 20 years have given us increasingly more evidence that a particular form of Vitamin E found in nature has remarkable benefits for many of our chronic health conditions.

Vitamin E was discovered in 1922 as an anti-sterility vitamin. It was observed that when this substance was missing from the diet of laboratory rats, they became infertile. In 1936 the molecule was isolated from wheat germ oil but its structure was not completely known until 1938. It was then named "tocopherol" which is Greek for "to carry a pregnancy". At this time, Vitamin E "tocopherol" was found to have anti-oxidant properties. The drop of Vitamin E in your bottle of olive oil prevents the oil from becoming rancid. This is an antioxidant effect.

Vitamin E is naturally found in plants (where it acts as an anti-oxidant) and exists as a family of eight molecules with similar structure. There are four tocopherols (alpha, beta, gamma and delta) and four tocotrienols (alpha, beta, gamma and delta) in this Vitamin E family. The tocotrienols were discovered in 1964. They were not the subject of much research at the time because plant sources of Vitamin E were so rich in tocopherols. Alpha tocopherol remained the main focus of Vitamin E research until ~ 2000 and it was the major Vitamin E molecule promoted in nutritional products since ~ 1990. But over time, research on the benefits of alpha tocopherol had become equivocal and often disappointing. In the 1980s and 1990s researchers began looking at the other tocopherols and tocotrienols and two things became clear: 1) the most beneficial compounds in the Vitamin E family appear to be the delta and gamma tocotrienols, and 2) when tocopherols and tocotrienols are taken together, the tocopherols block the absorption of tocotrienols and mute their many beneficial functions. Researching the effects of Vitamin E using high alpha tocopherol Vitamin E products essentially negated the value of the tocotrienols that were present.

Enter researcher Barrie Tan PhD. I recently met him at a medical conference and learned that he has been researching Vitamin E for over 30 years. He discovered the three main sources of tocotrienols: from palm oil in the 1980s, and from rice bran oil in the 1990s. These oils contain tocotrienols but still contained a high amount of tocopherols. In 1999 he fortuitously discovered

that the annatto plant, whose seed oil is used to make a natural food coloring, contained 100% delta and gamma tocotrienols. Also called the Amazonian lipstick plant, annatto has been the subject of over 20 years of research and found to be a near panacea for the chronic diseases of aging.

Delta tocotrienols were shown to lower total and LDL cholesterol, lower triglycerides and raise HDL cholesterol in several animal studies. Two human studies showed similar extremely favorable cholesterol results as well as a decrease in blood vessel wall inflammation markers. A separate human study showed the "antivelcro effect" of tocotrienols, lowering markers that reflect the stickiness of cholesterol fats to the blood vessel wall. Another recent animal study showed a 24 – 36% reduction in atherosclerotic lesions (plaque) with the use of tocotrienols.

When cardiovascular disease risk is linked to obesity and high blood sugar it is called the metabolic syndrome. This syndrome often results in fatty liver disease which is believed to affect 30% of US adults. In animal and human studies, delta-tocotrienol was shown to lower the triglyceride and inflammation markers of metabolic syndrome and it also improved many of the specific measurements of fatty liver.

Delta tocotrienol has been showing remarkable effects in cancer studies as well. The molecule of delta tocotrienol fits into the estrogen receptor and works much like tamoxifen in reducing breast cancer proliferation. The combination of tamoxifen and delta tocotrienol work synergistically to further inhibit cancer when used together. Animal studies have shown that delta tocotrienols reduce tumor size and cancer spread in Her-2 positive breast cancer. Results of a similar study in humans is pending.


Cancers stimulate the formation of new blood vessels in order to obtain nutrients to feed itself. Research has shown that delta tocotrienol can starve cancer by inhibiting blood vessel formation. Adding delta tocotrienols was shown to double survival time in recurrent ovarian cancer patients taking Avastin (the cancer drug that decreases new blood vessel formation). Another anti-cancer

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INTEGRATIVE AND HOLISTIC HEALTH AND WELLNESS

Some Common Medications that can Interfere with your Dietary Intake of Nutrients

- Delta tocotrienol has been shown to have many beneficial effects including lowering cholesterol, reducing inflammation, promoting bone strength, protecting the liver and increasing survival rates in cancer.
- The typical American diet contains ~ 2mg tocotrienol per day. This low dose does not confer the health advantages seen with supplementation of 100 – 900mg/day.
- The Annatto plant contains 90% delta and 10% gamma tocotrienols. It is, so far, the only natural source of 100% tocotrienols.
- Delta gold™ is concentrated delta and gamma tocotrienols cleanly extracted (100% natural, no solvents) from the annatto plant in a process patented in 2002. Many high quality supplement companies have added Delta Gold™ to their formulas. Unfortunately most have not taken out the alpha tocopherol.
- Alpha tocopherol blocks the absorption of tocotrienols and mutes their beneficial functions
- When the tocopherols are over 15% of the total daily Vitamin E intake, they will interfere with the functions of the tocotrienols.
- The average American diet contains about 15mg of alpha tocopherol. This can come from a few ounces of nuts or sunflower seeds and/or a few Tablespoons for wheat germ, safflower or sunflower oil. It is not necessary to supplement with more alpha tocopherol.
- Many high quality supplement companies are removing alpha tocopherol from their products and only including the beneficial tocotrienols – especially the delta and gamma tocotrienols (as in Delta Gold™)
- Tocotrienols should be taken with meals – not on an empty stomach; no more than 300mg per dose. Healthy persons should take 100 – 200mg per day.
- Treating specific conditions: Cardiovascular disease 300mg 1 gelcap 1 – 2 x/day; Fatty Liver disease 300mg 1 gelcap 2x/day; Bone loss 300mg 1 gelcap 2 x/day; cancer prevention 300mg 2 – 3 x/day



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mechanism used by delta-tocotrienols is called chemosensitization – helping the chemotherapy work better. Delta tocotrienols added to a gemcitabine protocol extended survival in an animal study of pancreatic cancer. Research has shown that delta tocotrienols can also decrease tumor volume and growth of melanoma. More studies using delta tocotrienols in other cancers are pending.

Animals with conditions of excessive bone loss showed that delta tocotrienols promoted bone formation and prevented fracture recurrence. There is evidence that delta tocotrienols may also have beneficial effects in the prevention of Alzheimer's disease, skin conditions, eye health, arthritis, immune conditions and radiation poisoning. There have been over 100 studies and clinical trials using

delta tocotrienols and, so far there have been no side effects! More studies are nearing completion and many more initiated on this little Amazonian lipstick plant, Annatto. Dr. Tan calls it his One Plant Wonder!!!! You will definitely be hearing more about this natural treatment for so many chronic conditions of aging.

Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, is Board Certified in Integrative Medicine, and is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 20 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.