TOCOPHEROLS

Vitamin E is thought of, and properly so, as an antioxidant. Most people also think of Vitamin E primarily as alpha tocopherol, or, as one of the alpha tocopherol esters. As it turns out, what most people consider to be …

VITAMIN E (ALPHA TOCOPHEROL) IS NOT REALLY SUCH A GREAT ANTIOXIDANT.

Its antioxidant activity is positively dwarfed by the antioxidant activity of gamma tocopherol particularly, and the other tocopherols as well. The mixed tocopherols represent the complete vitamin E family – alpha, beta, gamma, and delta tocopherols.

When you see Vitamin E on the label of a nutrition supplement, it is almost always one of the various forms of alpha tocopherol. Whether the label says alpha tocopherol, alpha tocopheryl succinate, alpha tocopheryl acetate, vitamin E, natural vitamin E, or whatever, it is certain to be an alpha derivative.

Gamma tocopherol has been measured in scientific research to be far more potent than alpha tocopherol in suppressing free radicals in living organisms. Mixed Tocopherols in your NUTRI-SPEC supplements have the highest available concentration of gamma-tocopherol, a far more potent antioxidant than ordinary Vitamin E. The mixed tocopherols in your Oxy Power are approximately 62% gamma tocopherol.

It is interesting to note that alpha tocopherol can actually displace gamma tocopherol in living tissues. So, now think about all the people that are taking 400, 800, or more international units of vitamin E each day in the belief that they are getting antioxidant protection, when actually they are destroying the most potent (and all too rare) antioxidant of all, gamma tocopherol.

This is not to say that alpha tocopherol is bad. Quite the contrary. One form of alpha tocopherol, the ester alpha tocopheryl succinate (which you find in Activator and many of your other NUTRI-SPEC products) is more effective in its role as an anti-thrombic agent than any of the other tocopherols, and it is more effective in boosting immune function.

There is research showing that the combination of gamma tocopherol plus alpha tocopheryl succinate gives synergistic benefits in protection against cardiovascular disease, cancer, and many other diseases. This is particularly exciting news because you have high concentrations of gamma tocopherol in your Oxy Power, while at the same time all your patients are deriving the synergistic benefits just described because they are also getting alpha

tocopheryl succinate in their Activator. Nobody can duplicate what you are doing for your patients in terms of supporting longevity and well-being.

Research shows that ordinary tocopherols (vitamin E) do not influence the activities of mammalian polymerase and angio-genesis at all. On the other hand, gamma tocopherol protects and strengthens the heart, and preserves the integrity of the vascular system.

PUFA and alpha-tocopherol are the most oxygen-sensitive constituents of cells. The presence of alpha-tocopherol in biological membranes is required but not sufficient to protect them against lipid peroxidation. Alpha-tocopherol and cytochrome b5 permit operation of lipid-radical cycles and the participation of lipid-radical reactions in key processes occurring in membranes. Lipid-radical reactions in membranes work as an important component of normal cell metabolism. Under normal circumstances there is effective electron transfer from PUFA to peroxyl radicals: LOO-- $\rightarrow$ LOO-. When the oxidative pathway of PUFA metabolism is excessive, LOO converts instead to LOOH, with 2 toxic reactive secondary products, malondialdehyde and methylglyoxal.

It is possible that alpha-tocopherol provides for the activity of the lipid-radical cycles involving cytochrome b5. These lipid-radical cycles protect membrane lipids from oxidation and control the kinetics of membrane processes. The NADPH oxidation energy is transformed into the energy of lipid pulsations, and this energy is used for activation of membrane enzymes.

Alpha-tocopherol is thought to act as a lipid-soluble antioxidant by scavenging the lipid peroxyl radical (LOO), giving rise to LOOH. In actuality, alpha-tocopherol exerts its protective action by converting LOO into the parent, unoxidized lipid molecule (LH) with concomitant formation of O2-. Thus the oxygen or superoxide anion-radical is released.

Vitamin E is a membrane stabilizer. Vitamin E deficiency in the brain causes a decrease in palmitic and other SFA (essential to brain structure and function), and an increase in DHA (toxic in anything more than trace levels --- despite health food propaganda to the contrary). In the liver, vitamin E deficiency results in higher stearic acid and other SFA, lower MUFA, Linoleic Acid (omega 6), and DGLA, but no change in Arachidonic Acid. The overall liver decrease in n-6 is compensated by an increase in n-3.

- Vitamin E deficiency = $\uparrow$ DHA & $\downarrow$ SFA in brain
- Vitamin E deficiency = $\uparrow$ liver SFA, $\downarrow$ MUFA, $\downarrow$ LA, $\downarrow$ DGLA, no change in AA, w/ the overall $\downarrow$ in liver n-6 compensated by an $\uparrow$ in n-3

- Familial hypobetalipoproteinemia: early neurological, hematological, and ocular manifestations in 2 affected twins responding to vitamin E and vitamin A supplementation ----- This disorder of lipid metabolism is characterized by extremely low plasma apolipoprotein B as well as low levels of total and LDL cholesterol. All clinical symptoms and the neuro-physiological abnormalities improved after high-dose vitamin E and vitamin A supplementation.

Vitamin E has a critical role in long-chain n-3 PUFA interactions with immune functions, often reversing the damaging effects of fish oil.
Pretreatment of mice by vitamin E induced a decrease in genotoxicity by 80% in kidney and by 55% in liver.

Antioxidants such as melatonin, vitamin C, and vitamin E probably play important roles in reducing or eliminating the oxygen damage produced by NO. Vitamin E and melatonin can prevent the majority of metal-mediated (iron, copper, cadmium) damage.

Many low-molecular weight antioxidants (vitamin C, vitamin E, glutathione, carotenoids, flavonoids, and other antioxidants) are capable of chelating metal ions, reducing their catalytic activity to form ROS.

Vitamin E = raises Na+, raises Mn

The truth about vitamin E is that its antioxidant activity can be every bit as powerful a protector of the cardiovascular system as the medical/ pharmaceutical establishment feared. That is why they had to attack it so aggressively. Do even the most superficial Medline search of vitamin E, and with just a few clicks of the mouse you will find countless dozens of studies showing that even a fragmented antioxidant such as alpha tocopheryl acetate will:

- decrease lipid peroxidation throughout the body, and particularly in the cardiovascular system

- decrease platelet aggregation (“thins the blood”)

- decrease inflammation in the vasculature (--- and, decreases inflammation systemically)

- lowers C-reactive protein

- decrease oxidation of LDL cholesterol

- prevent and relieve angina

- decrease incidence of strokes

- improve myocardial recovery from exercise

Vitamin E increases prothrombin time (i.e., potentiates the effect of Warfarin).

One interesting study compared the antioxidant effects of lipoic acid with those of alpha tocopherol (Vitamin E.) The results? Lipoic acid effectively decreased LDL cholesterol oxidative susceptibility associated with atherosclerosis (but not quite as well as alpha tocopherol). Lipoic acid decreased urine FZ-isoprostanes (but not quite as well as alpha tocopherol). Lipoic acid decreased plasma protein carbonyl levels (which are a key marker for aging processes) (while alpha tocopherol had no effect whatsoever.)

- Oxidation of hemoglobin is prevented by both lipoic acid and vitamin E (but not by vitamin C).

- In UC patients, rectally administered d-alpha tocopherol has a protective effect.

- In both UC and CD, mucosal biopsies revealed antioxidant deficiencies as follows: urate = CD decreased 62%, UC decreased 47%; glutathione = CD decreased 59%, UC decreased 65%; CoQ10 = CD decreased 76%, UC decreased 91%; ascorbic acid = CD decreased 35%, UC decreased 73%. The mean alpha tocopherol content was unchanged. These observations support decreased reduced and total ascorbic acid in inflamed IBD mucosa, and demonstrate the loss of antioxidant defenses that severely compromise the inflamed mucosa, rendering it more susceptible to oxidative tissue damage.

- In rats with UC induced by acetic acid, vitamin E and selenium had a protective effect.

The vitamin E in Activator is the highest biological activity and highest quality you can find anywhere. You may not realize that vitamin E is the one nutrient that is available in several different grades, all of which appear on the vitamin supplement labels as d-alpha Tocopherol. There is no way you can tell when you look at a product label whether you are getting common low grade vitamin E, or the high grade that you get from NUTRI-SPEC.

Something else you may not know about vitamin E is that almost all vitamin E in supplements is derived from wheat. Wheat, of course, is probably the number one food allergen. For that reason we have gone to the extra expense of getting your vitamin E from a non-wheat source.

Check out how “little” vitamin E is in your Activator? "That's all?" you ask, "I've seen antioxidant supplements with as much as 800 I.U.!"

Yes you have -- and those products are damaging people by the thousands. Damage from mega doses of vitamin E? You betcha.

Did you know that:

- Vitamin E stimulates anaerobic fermentation at the cellular level? (Which, by the way, is the cause of most cancers.)
- Vitamin E inhibits energy production and proper utilization of glucose?
- Vitamin E elevates blood pressure?
- Vitamin E can put a strain on the heart?
- Vitamin E can cause cardiac arrhythmias?
- Vitamin E can raise cholesterol levels?

Next to vitamin C and calcium, vitamin E has to be considered the most abused nutrient. It is taken in mega doses by oodles of people who have no idea what they are doing to themselves. As it lowers their energy, making them sick and weak, it can, if taken long enough, cause any or all of the problems listed above. Ironically, these may be the symptoms for which the person is taking vitamin E to cure. Such is the mess that typically results from non-specific, unscientific supplementation.

The quantity of vitamin E in Activator is actually several times your recommended daily allowance. Considering also the high quality of this particular form of vitamin E, plus that it is accompanied in Activator by such a rich array of other anti-oxidants and bio-protective factors -- this is all the Vitamin E the vast majority of people need to take.

And --- in accord with the NUTRI-SPEC principle of specificity --- the few people who <u>do</u> benefit from higher doses of vitamin E will be quite obvious to you if you do your NUTRI-SPEC testing. These few individuals will invariably test out as being either Dysaerobic or Glucogenic. Giving them, in addition to their Activator, the other indicated supplements (either Oxygenic D and D-Plus or Oxygenic G) will give them more than enough additional vitamin E. Also, of course, most of your patients will ultimately be given OXY POWER/Diphasic PM when they transition to your Diphasic Nutrition Plan.

In its damaging role as an oxidant, Vitamin C destroys the activity of one other important anti-oxidant -- Vitamin E. But, the reverse can also occur. Excess Vitamin E will also act as an oxidant instead of an anti-oxidant and in fact, doses of Vitamin E much above 140 milligrams will actually destroy the activity of Vitamin C.

Brown K.M., et al. Erythrocyte vitamin E and plasma ascorbate concentrations in relation to erythrocyte peroxidation in smokers and non-smokers: dose response to vitamin E supplementation. American Journal of Clinical Nutrition. 1997;65:496-502.