Antioxidative Properties of Vitamin E

Both members of the vitamin E family act as antioxidants. However, the natural vitamin E is a more powerful antioxidant due to its unique molecular structure. The shorter tail enables quicker and more efficient movement around cells. The chemical structure of tocotrienols incorporates a chain of polymers that consists of unsaturated materials. This gives it the ability to penetrate saturated fat cells around the brain and liver. It is a vital compound in the body's immune system. This provides protection against cell damage in the brain, tumors and various types of cancers. It also assists in the rehabilitation of damaged cells. Tocopherol has a much lower anti-oxidative capacity.

Fortunately, new research on vitamin E is helping restore its reputation. In fact, it appears that properly formulated vitamin E may be even more useful than originally thought. However, you can't use vitamin E products blindly. The devil is in the details - and you need to understand them to get to the benefits.

Most vitamin E supplements contain only alpha-tocopherol, or to be precise DL-alpha-tocopherol, which is a mixture of two optically different forms of alpha-tocopherol, D and L. Even though DL-alpha-tocopherol is perhaps sufficient to prevent vitamin E deficiency, it is not optimal for health when used alone. It is now believed that vitamin E represents a much wider family of related but distinct natural compounds including alpha, beta, delta and gamma tocopherols as well as alpha, beta, delta and gamma tocotrienols.

Alpha tocopherol, the main ingredient in most vitamin E supplements, is a well-documented antioxidant. However, every antioxidant has a limited range of targets, i.e. it is effective only against particular kinds of free radicals. Other tocopherols, beta, delta and most importantly gamma, are related but distinct compound with a somewhat different antioxidant range. They complement and enhance the activity of alpha tocopherol. Several studies indicate that **mixed tocopherols are more effective than alpha tocopherol i**n quenching free radical and preventing disease. Notably, one study showed that high doses of alpha tocopherol taken alone reduced the blood levels of gamma tocopherols by 30-50%. This may explain why in some cases high doses of standard vitamin E supplements may do more harm than good. Indeed, it does not pay to fortify one wall of your castle with blocks taken from another wall.

Tocotrienols

Tocotrienols are also a part of vitamin E family. And perhaps the most important part at that.**Tocotrienols are about 50 times more potent than tocopherols** as antioxidants. They were shown to increase the life span of laboratory animals by about 20%. In human studies, tocotrienols showed an impressive promise in preventing and treating degenerative diseases. In one study, for instance, tocotrienols were shown to reverse the narrowing of the carotid artery due to atherosclerosis, an impressive feat for a noninvasive treatment. Similarly to tocopherols, tocotrienols come in alpha, beta, gamma and delta forms.

Natural vs synthetic

In many cases, synthetic vitamins (if properly produced) are as effective as the natural ones. Vitamin E is one of the exceptions. Natural vitamin E comprises only D forms of tocopherols and tocotrienols, while the synthetic one is usually an equal mixture of D and L forms. Isolating the D form from the mixture is possible but expensive, so most manufacturers don't bother. L form appears to be less biologically effective than the natural D form, particularly when it comes to oral supplementation. Despite higher cost, it is best to use the natural form unless the manufacturer expressly states that the supplement contains D form only.

Feeding Instructions of Vitamin E Products (from Jasper Soy Processors)

Note; Tocotrienols are a Natural Vitamin E with about 50 times potency of natural tocopherols as antioxidants. Natural Alpha tocopherol is known to have twice the potency of dl-alpha tocopherol (synthetic form) commonly used in feed premixes). Normally processing eliminates or partially destroys tocotrienols. Whole soybeans or extruded soybeans (uniquely processed) contain extremely high levels of both tocopherols and toctrienols. Therefore, Extruded Soy products are the best known source of these

nutrients. Currently there are four of these products on the market as follows; Full Fat Extruded Soy, Extruded/Expelled Soy, Extruded/Expelled Soy Oil, and Extruded/Expelled Lecithin.

Vitamin E Levels of Extruded Products:

Extruded.Lecithin ------1400 ppm

Extruded Soy Oil -------1280 ppm

Extruded Soybeans ----275 ppm

Candi-Soy ----------200 ppm

Diet Inclusion Rates: (for animal species not listed, contact a Jasper Soy Processor's Nutritionist)

Minimum Rate: To aid in the prevention of vitamin E deficiency while feeding diets formulated with by-products, or supplemented with only synthetic vitamin E. (feed @ not less than listed)

Product ---------- Ruminants ------- Swine ---------- Poultry

Extruded.Lecithin ------ .1 lb/day--10 lb/ton--10 lb/ton

Extruded Soy Oil ------- .12 lb/day--12 lb/ton--12 lb/ton

Extruded Soybeans ---- .5 lb/day--50 lb/ton--50 lb/ton

Candi-Soy---------- 1.5 lb/day--150 lb/ton--150 lb/ton

Health & Production Rate: To reduce ration costs or improve profits, and to supply proper levels of natural vitamin E, known to improve health, reduce mortality, improve reproduction, and increase longevity of life, while improving feed efficiency. (feed at a rate more than listed, however, take note that the products must be limited for ruminants))

Product ---------- Ruminants ---------- Swine ---------- Poultry			
Extruded.Lecithin ------	.3 lb/day (max.)	>20 to <70 lb/ton	>20 to <70 lb/ton
Extruded Soy Oil -------	.3 lb/day (max.)	>25 lb/ton	>25 lb/ton
Extruded Soybeans ----	>.75 lb/day	>200 lb/ton	>200 lb/ton
Candi-Soy----------	> 2.5 lb/day	>300 lb/ton	>300 lb/ton

Note: Optimum health and production performance is achieved by elimination of any and all by-products, and using extruded soy or Candi-Soy to provide a well balanced all natural ration. See sheet titled replacement values, for proper ration replacements.