

Protect Dairy Herd's Health and Profitability with ADM Nova-E™ Natural-Source Vitamin E

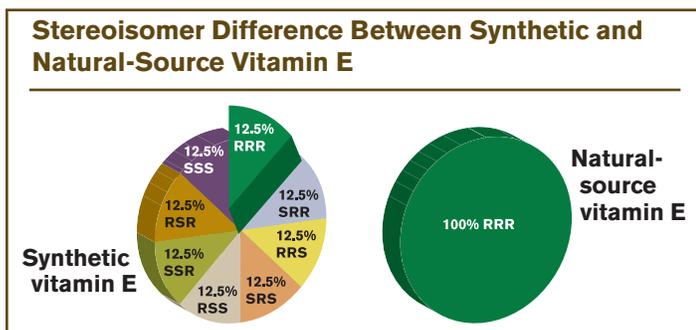


Vitamin E (alpha-tocopherol) is a fat soluble vitamin and is a key component in the body's antioxidant system. Because vitamin E is fat soluble, it exerts the greatest benefits in the lipid portion of cells (cell membranes). Dairy cattle, as all animals, require oxygen for life. Oxygen is very reactive and can be a toxic element. Because of the potential toxic effects of oxygen on cells, organs, and the body, the body possesses a complex antioxidant system to protect the cells. The antioxidant properties of vitamin E provide many benefits to dairy cattle including enhanced immune function, improved mammary gland health, and improved reproductive function.

Feeding adequate levels of vitamin E to dairy cattle has been shown to prevent white muscle disease in calves, reduce the prevalence and severity of clinical mastitis, reduce udder edema, and reduce the prevalence of retained placenta in cows. All of these disorders are related to the toxic oxidative affects discussed previously.

Natural-source vitamin E is derived from vegetable oils, primarily soybean, canola, and sunflower oils. The vitamin E found in nature is known as d-alpha-tocopherol or more correctly, RRR-alpha-tocopherol. For maximum stability, RRR-alpha-tocopherol is converted to RRR-alpha-tocopheryl acetate for animal diets.

Synthetic vitamin E, commonly referred to as dl-alpha-tocopherol or all-rac-alpha-tocopherol, is a mixture of *eight alpha-tocopherol stereoisomers in equal amounts*. Only one of these stereoisomers, 12.5% of the total mixture, is RRR- or d-alpha-tocopherol, the natural form. The remaining seven stereoisomers have different molecular configurations due to the chemical randomization in the manufacturing process.



Natural-Source Vitamin E is Chemically Unique

Both natural-source vitamin E and synthetic vitamin E are absorbed in the body. However, after absorption, a specific transport protein in the liver known as RRR-a-Tocopherol Transport Protein (a-TTP) recognizes the natural d-alpha-tocopherol and gives it priority over the synthetic forms.^{1,2} The unrecognized forms of synthetic vitamin E are preferentially excreted.³

Natural-Source Vitamin E is Biologically Superior

Owing to this discriminatory process, d-alpha-tocopherol, the natural form, is retained better and for longer time in the body when compared to the synthetic form.^{3,4}

Dairy calves receive most of their vitamin E through the cow's colostrum (not through the placenta). Vitamin E serves to prevent white muscle disease and help support the calf's immune system. Cows fed natural-source vitamin E had higher levels of alpha-tocopherol in their colostrum, and their calves had higher blood plasma levels than cows on the same IU level of synthetic vitamin E.⁵

Feeding natural-source vitamin E to dairy cows has been shown to provide higher plasma levels and reduced the drop in alpha-tocopherol at calving compared to cows fed an equal IU level of synthetic vitamin E. Thus, feeding natural-source vitamin E during the dairy cow dry period and lactation should better protect dairy cows from the common disorders of mastitis, retained placentas, and udder edema near calving.⁵

References:

1. Human plasma and tissue alpha-tocopherol concentrations in response to supplementation with deuterated natural and synthetic vitamin E. *Am J Clin Nutr* 1998; 67:669-683.
2. Biokinetics of and discrimination between dietary RRR- and SRR-alpha-tocopherols in the male rat. *Lipids* 1987;22:163-172.
3. Absorption, lipoprotein transport and regulation of plasma concentrations of vitamin E in humans. *J Lipid Res* 1993;34:343-358.
4. Relative biological values of d-alpha-tocopheryl acetate and all-rac-alpha-tocopheryl acetate in man. *Am J Clin Nutr* 1980;33:1856-1860.
5. Relative bioavailability of all-rac and RRR vitamin E based on neutrophil function and total alpha-tocopherol and isomer concentrations in periparturient dairy cows and their calves. *J. Dairy Sci.* 2008; 92:720-731

Available Products:

- NOVA-E 44 (20,000 IU/lb)
- NOVA-E 405 (183,708 IU/lb)
- NOVA-E 1000 Oil (453,600 IU/lb)
- Super E 20 (10,000 IU/lb)

April 2009

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