

NATURAL VITAMIN E SUPPORTS PERFORMANCE RECOVERY

BUCKEYE™ Nutrition publishes research on the benefit of supplementing natural vitamin E in performance horses.



Vitamin E's main role as an antioxidant is to help prevent free radical chain reactions, especially in cell membranes, to protect the body from oxidative stress.

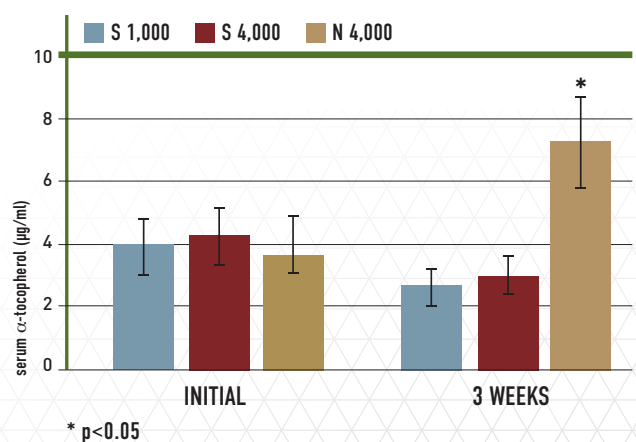
Vitamin E is abundant in fresh forages, making it readily available to horses with access to pasture; however, it becomes unstable in the process of baling and storing hay. Performance horses are often housed in stalls, lacking access to pasture, and due to their high-intensity work load, tend to incur more oxidative stress than horses at maintenance. To account for horses that do not have access to fresh pasture, many commercial equine feeds formulated for performance horses include vitamin E in their ration.

The NRC (2007) suggests that supplying vitamin E above the current 80 IU/kg dry matter per day requirement may improve vitamin E status in exercising horses. Research conducted by BUCKEYE™ Nutrition, Waltham Petcare Science Institute, the University of Georgia and the University of Kentucky set out to investigate the effects of natural versus synthetic vitamin E supplementation on serum alpha-tocopherol (the body's main form of vitamin E), oxidative stress, muscle damage and inflammatory response in performance horses.

- **Horses:** 18 mature stock-type horses
- **Natural vitamin E supplement:** 4,000 IU per day
- **Synthetic vitamin E supplement:** 1,000 or 4,000 IU per day
- **Results:** Horses consuming feed supplemented with natural vitamin E had significantly higher serum alpha-tocopherol levels, and improved oxidative and inflammatory response in exercising horses.

▶ EFFECT OF VITAMIN E IN EXERCISING HORSES*

*adapted from Fagan et al., 2020. <https://doi.org/10.1016/j.jevs.2020.103103>



- **Implications:** Supplementing the diet with natural vitamin E can help support post-exercise repair and recovery in performance horses.



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Form of Vitamin E Supplementation Affects Oxidative and Inflammatory Response in Exercising Horses

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HIGHLIGHTS

- ▶ Natural vitamin E supplementation was superior in raising and maintaining serum α -tocopherol.
- ▶ Horses supplemented with natural α -tocopherol exhibited less oxidative and inflammatory response.
- ▶ Minimal advantages were found with increasing the level of synthetic α -tocopherol.

Vitamin E (alpha tocopherol) is an essential antioxidant that may benefit athletes by reducing oxidative stress and influencing cytokine expression. Supplements can be derived from natural or manufactured synthetic sources. This study aimed to determine (1) if supplemental vitamin E is beneficial to exercising horses and (2) if there is a benefit of natural versus synthetic vitamin E.

After 2 weeks on the control diet (vitamin E-deficient grain and hay), 18 horses were divided into three groups and fed the control diet plus (1) 1,000 IU/d synthetic α -tocopherol (SYN-L), (2) 4,000 IU/d synthetic α -tocopherol (SYN-H), or (3) 4,000 IU/d RRR- α -tocopherol (natural source [NAT]). On day 7, horses began a 6-week training protocol, with standard exercise tests (SETs) performed before and after the 6-week protocol.

Venous blood samples were collected on days 0, 7, 29, and 49. Horses fed NAT had higher α -tocopherol ($P < .05$) at post-SET1 through post-SET2. Plasma thiobarbituric acid-reactive substance levels were lower in NAT versus SYN-L horses after SET2 ($P = .02$). Serum aspartate aminotransferase was lower after exercise in NAT horses versus SYN-L and SYN-H ($P = .02$), and less reduction in stride duration was seen after exercise in NAT as compared with SYN-L and SYN-H ($P = .02$). Gene expression of tumor necrosis factor α was lower in NAT compared with SYN-H ($P = .01$) but not SYN-L.

In conclusion, feeding higher levels of natural vitamin E source resulted in higher serum α -tocopherol levels as well as some improvement in oxidative and inflammatory response and improved functional outcomes in response to an exercise test.