

# Advances in Equine Nutrition

## Volume II

Edited by

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## VITAMIN REQUIREMENTS AND SUPPLEMENTATION IN ATHLETIC HORSES

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Many vitamins regulate glucocorticoid synthesis, thus limiting some of the negative responses associated with stress, and are therefore necessary to athletic horses. Vitamin A is required for development of epithelial cells. Vitamin A is also important in maintaining the integrity of mucous membranes, and these tissues are certainly put under considerable stress in exercising horses. According to recent studies, it is not possible to give very precise estimates for vitamin A requirements; 45-75 IU/kg body weight per day can be recommended, and 100 IU is sufficient in all circumstances. Vitamin E is an important antioxidant, and it protects against oxidative damage to tissues induced by exercise. Horses can tolerate low dietary levels of vitamin E for at least four months, but 3 to 5 mg/kg body weight per day can be recommended for horses in training and racing. Concerning vitamin D, the influence of it on calcium metabolism is not as great in horses as it is in other domestic animals under normal conditions, and deficiencies in practical diets are not likely. There are no new studies upon which to base recommendations; 5-10 IU/kg body weight per day seems to be adequate. The requirements for water-soluble vitamins can normally be met by practical diets and their synthesis in the body. Vitamin C has been studied most during recent years, mainly because it is also an antioxidant which prevents radical-induced oxidative damage. Decreased synthesis of vitamin C due to stressful conditions and infections may increase requirements. Based on studies, 30-40 mg/kg body weight per day can be recommended in the case of infections and injuries. There are no accurate requirements determined for B-complex vitamins. Needs for B<sub>1</sub> and B<sub>2</sub> are 4-5 and 2 mg/kg feed DM, respectively. Horses that are anemic, perform poorly or have low serum values may benefit from 20 µg daily supplementation of folic acid. 0.02-0.03 mg/kg body weight per day biotin is sufficient for healthy horses, but 0.03-0.05 mg/kg body weight per day can be recommended for horses with poor hooves. No dietary requirements have been determined for fat-soluble vitamin K.

