

Vitamin E Deficiency

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Vitamin E deficiency is something that is fairly common in the Northeast. Vitamin E is an antioxidant that helps maintain normal neuron function. An antioxidant is a substance that neutralizes free radicals, which are molecules that can cause cell damage. Neurons are the cells that make up our nervous system and enable our muscles to function appropriately. Horses deficient in vitamin E will experience problems with both their nervous system and their musculoskeletal system. The main source of vitamin E in the horse's diet comes from fresh green pasture. Both foals and adults can be affected by deficiencies in vitamin E. Vitamin E deficiency can cause several nervous and musculoskeletal system disorders. Two important ones include white muscle disease, which occurs primarily in foals, and equine motor neuron disease, which affects adults. Selenium (and selenium deficiency) goes along with vitamin E but vitamin E will be the primary focus of this article.

Clinical Signs

White Muscle Disease

Most cases of WMD are in foals less than 2 months of age. WMD is caused by low vitamin E or sometimes selenium *in utero*, or while the foal is still inside the mare. Clinical signs in mild cases include difficulty swallowing, stiffness, and lethargy. Foals can be recumbent. If the muscle that makes up the heart is affected, cardiac signs may also be seen including increased heart rate, irregular heart rhythm, murmurs, and respiratory stress. There is no gender or breed predilection. Prognosis for foals with WMD is guarded.

Equine Motor Neuron Disease (EMND)

EMND results from chronic vitamin E deficiency, causing oxidative stress and damage to neurons and subsequently, muscles. Early clinical signs include weight loss and muscle atrophy followed by gait abnormalities and tremors while standing as the disease progresses. Horses may also stand base-narrow with their legs together and keep their head low. Geldings may drop their penis. Severe cases can progress to recumbency. Pigment will also deposit on the back of the eye, though vision remains normal. Recovery following treatment is slow, even with appropriate supplementation.

In adults, another newer condition related to EMND is called vitamin E deficient myopathy. This results in milder muscle loss and weakness. It can often be a cause of poor performance. It has yet to be determined if this is early EMND or a separate condition but these horses tend to

respond to vitamin E supplementation within 6 weeks and are able to return to normal work or exercise.

Diagnosis

Your veterinarian will take a blood sample from your horse and spin it down so that it separates into platelets, which form blood clots, and serum, which contains all the other components of blood, including vitamin E. Based on your horse's vitamin E level, your veterinarian will recommend an injection of vitamin E, feed supplementation, or both.

More advanced diagnostics include muscle and nerve biopsies to evaluate for damage at the cellular level.

Treatment

For affected foals and more critical adults, rapid treatment with a vitamin E injection is recommended. For more stable adults, oral supplementation with a good quality vitamin E supplement is appropriate. Deficient adult horses should receive 2000-5000+ IU of Vitamin E per day. Horses in heavier work, however, may require more vitamin E than their less active counterparts. Mares in foal should be tested for vitamin E to ensure adequate levels during gestation. The recommended dose for a 1000 pound mare during gestation is 600-2000 IU/day.

Sources:

Reed, S. M., Bayly, W.M., Sellon, D.C. Equine Internal Medicine. 2010.

Walridge, Bryan., "Vitamin E and Selenium Status in Horses." Kentucky Equine Research. 2013.