



PART 1

Selenium: an essential mineral

Selenium is an essential trace mineral. It is necessary to maintain good health but is needed only in small amounts. Selenium naturally occurs in the soil and is absorbed by both the forages and grains we feed to our horses. Since the selenium content of soils varies around the world, feeds grown in different areas will contain different selenium levels. In the U.S., for example, the northwest, southeast and Great Lakes areas are known to be selenium-deficient. The Rocky Mountains and Great Plains regions have alkaline soils, which are rich in selenium.

Why do horses need selenium?

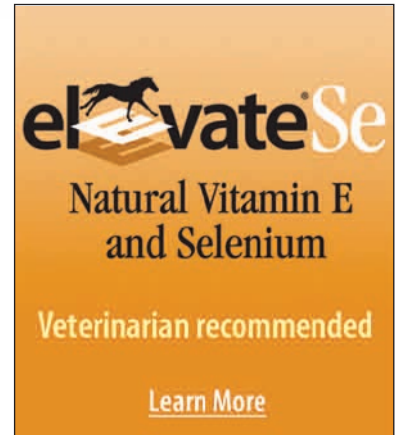
Selenium works in concert with vitamin E to defend the body's cells from damaging oxidative byproducts known as free radicals. Free radicals are released during energy production. Selenium is a component of glutathione peroxidase, a beneficial enzyme that prevents free radicals from forming. Glutathione peroxidase also destroys lipid peroxidases (non-beneficial enzymes), which damage cell membranes. Once damaged, cells no longer function properly, leaving horses susceptible to multiple health problems.

Horses use energy to fuel bodily functions and movement. The greater the demand for energy, the greater the number of free radicals produced. Your horse's body is equipped to deal with small amounts of these oxidative byproducts, but as the demand for energy increases, so does your horse's need for additional antioxidants to counter the onslaught of free radicals.

Hard-working horses, breeding stock, horses consuming feedstuffs low in selenium, or horses with certain muscular disorders may require supplemental selenium.

NRC recommendations

The National Research Council (NRC) minimum requirement for selenium is .1 mg of selenium per kilogram of dry matter (DM) consumed per day. The maximum tolerable limit is 2.0 mg of selenium per kilogram of dry matter consumed per day. Dry matter consumed for most horses is some combination of forage, grain and supplements. The amount of selenium required varies, depending on several factors, such as age,



reproductive status, work load and health history. Nutritionists and veterinarians use these parameters to evaluate an individual horse's selenium requirements.

Dry matter or as fed – what does this mean?

Water is present in both concentrates and forages (hay and pasture). The water content can vary tremendously between different feedstuffs. The greater the water content, the less concentrated the nutrients. Nutrient content reported on an “as fed” basis means the moisture content of the feedstuff is included. While this tells you what your horse is eating, it does not show you the best picture of the nutrition content of the feed. Nutrient content represented on a dry matter basis, on the other hand, represents the percentages of nutrients present in a concentrate or forage after the water has been removed. It reveals the actual amounts of the various nutrients in a feedstuff. Nutritionists and researchers prefer to compare feeds and make recommendations on a dry matter basis.

FDA guidelines – a place to start

The Food and Drug Administration (FDA) has set the daily recommended level of selenium for an “average” horse at a total of 3 mg per day. This is a very safe level of selenium consumption and well below the maximum tolerable or poisonous limits. When determining if your horse’s diet contains adequate selenium, you can use this average as a good reference. Each horse is an individual and has individual needs, so it is best to work with your veterinarian or nutritionist to determine your horse’s exact requirements, which in some cases may be higher than the recommended 3 mg per day.

What to look for:

Symptoms of selenium deficiency

- Stiffness
- Listlessness
- Lung edema
- Increased heart and respiration rates
- Muscle diseases, such as white muscle disease

Symptoms of selenium toxicity

- Blind staggers
- Colic
- Dark diarrhea
- Hair loss in mane and tail
- Weight loss and/or listlessness
- Hoof cracks, sore feet, laminitis

It is important to contact your veterinarian if you suspect your horse has a problem. As trained health care professionals they have the knowledge and tools necessary to properly diagnose the problem and recommend the best treatment.

Next issue: Part II - Selenium: how much is in your horse's diet?



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