

Stress, Metabolic Corrosion, And Nutrition

Are megadoses of Vitamin E the answer to the problem?

by Dr. Ron Rompala, Blue Seal Feeds, Inc., The Kent Group™

Maintaining a healthy horse can be a real challenge. In a healthy horse, the metabolic processes function properly. The horse has several regulatory mechanisms to maintain proper metabolism which are essential to keep healthy. However, stress through extremes in environmental temperature, heavy exercise, or inadequate nutrition can adversely affect a horse's metabolism.

Chemical reactions that are similar to those that corrode metal take place inside the body and are accelerated by stress. Alterations in metabolism due to stress increase substances, called free radicals, that can cause this metabolic corrosion. Substances called antioxidants keep an animal from becoming metabolically corroded. Without enough antioxidants, stress increases the chances of a horse having problems. Stressed horses are more prone to becoming infected with diseases and parasites, having skin disorders, having poor hair coats, having breeding problems, and losing stamina as a result of metabolic corrosion.

It is impossible for horses to be raised in a stress-free environment. Horses can be stressed from either inadequate management practices, weather conditions, or suboptimal nutrition. Reducing stress will benefit horses. For example, train horses properly before expecting them to perform optimally to a heavy workout. Also, you should provide proper shelter, especially under extreme weather conditions, and maintain a good worming and vaccination program.

The relationship between nutrition, stress, and health has been drawing a great deal of attention. Proper nutrition is important for minimizing the problems of metabolic corrosion due to stress. A number of nutrients play important roles in minimizing the adverse effects of stress in both animals and humans. Vitamin E, a potent antioxidant, is perhaps the most notable of the nutrients. Several studies have shown improvements in breeding, overall health, performance, and appearance by increasing Vitamin E levels. The question arises as to what is the ideal level of dietary Vitamin E. Positive responses are common to levels fed above those recommended by the National Research Council (NRC) which is a basic guideline used by nutritionists. However, feeding megadose levels greater than 100 mg/lb. of feed, which is about three times greater than NRC, is questionable as well as expensive. If horses respond favorably to megadoses of Vitamin E, one must ask the question as to what is really wrong with the horse. Horses responding to megadoses of Vitamin E must either have a severe stress placed upon them through management or environmental factors (weather, exercise, crowding) or have a nutrient deficiency or a dietary imbalance that reduces the antioxidant capacity that leads to metabolic corrosion.

In addition to Vitamin E, zinc, copper, selenium, manganese, iron, and Vitamin C are essential to minimize metabolic corrosion in animals. However, the proper balance of these nutrients in the diet is just as important as having the minimal levels. Excessive iron

intakes due to high levels in feed or drinking water cause metabolic corrosion. Reducing iron intake to optimal levels can prove just as beneficial and less costly as megadoses of Vitamin E.

Stress increases a horse's needs for trace minerals. Chelated trace minerals are used by a horse better than minerals from other sources. Providing horses with feeds containing chelated zinc, manganese, and copper is less costly than giving megadoses of Vitamin E. Thus, feeding chelated minerals takes care of the actual problems due to a mineral deficiency or imbalance. Feeding megadoses of Vitamin E would be like giving an aspirin for a headache. The pain is alleviated, but the cause of the headache still remains.

The frequency of feeding corn oil, soybean oil, or other vegetable oils to horses has become popular but increases the susceptibility of problems tied to metabolic corrosion. Problems with feeding high amounts of vegetable oils are accentuated with high iron levels in feed and drinking water. Rough-looking horses that are often fed vegetable oil over the winter respond favorably not only to feeding high levels of Vitamin E but also to feeding feeds with chelated trace minerals or reducing levels of iron.

To summarize, the need for proper nutrition is accentuated when horses are under stress. What's best for a horse is to reduce stress and maintain good nutritional practices. Find the problem causing the stress or the nutritional inadequacy. Is feeding megadoses of Vitamin E the answer? If horses respond favorably to megadoses of Vitamin E, there are problems that need fixing. Once these problems are corrected, horses will be fine given standard levels of Vitamin E.

1. Minimize stress upon a horse from the environment and management.
2. Look at the feeding program as a whole. Do not get hung-up over individual nutrients without looking at the whole nutrient profile. The action of Vitamin E is associated with a number of nutrients.
3. Avoid feeding excessive amounts of nutrients since this practice can be just as harmful as feeding too little. Some nutrients are toxic at levels just above what is considered optimal. Other nutrients in excess can bind or inhibit the effectiveness of other nutrients.
4. Watch for excessive iron levels in the feed and drinking water. It is not expensive to have iron levels checked.
5. Chelated zinc, manganese, and copper in the feed or supplement are beneficial, especially when fed to horses under stressful conditions. If iron levels in the diet or drinking water cannot be properly adjusted, consider feeding chelated minerals.
6. Look at the nutrient profile of the whole diet and balance properly when adding vegetable oils. When using vegetable oils, be aware of high levels of iron.

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