

Effect of Using a Nutritive Supplement on Equine Gastric Ulcer Incidence and Severity, and on Digestive Tract Bleeding

Peter Bedding, PhD, and Franklin L. Pellegrini, DVM

Overview: Studies over the past decade have documented that over 90% of race horses and 60% of show horses have gastric ulcers. Further, recent research has revealed a 63% incidence of colonic ulcers among performance horses (Pellegrini 2005). Both of these conditions can be a major contributor to colic, the number one killer of horses.

Modern feeding, training, and housing practices may contribute to the high incidence of digestive tract ulcers. The unique digestive system of the horse is designed to efficiently extract nutrients from, and subsequently ferment, forage sources such as hay. However, high athletic demands placed on performance horses dictate that diets must be supplemented with high energy carbohydrates, most often fed in 2 meals per day. This feeding practice, in conjunction with modern stabling and training practices, may lead to digestive tract upset and subsequent ulceration.

Many commonly used treatments are available to treat gastric ulcers. These products generally work by buffering the acid in the stomach (e.g., bismol, calcium antacids, sucralfate), or inhibiting the secretion of the acid (e.g., omeprazole, cimetidine, ranitidine). These products are designed to protect the stomach lining from gastric acid, thus allowing ulcers to heal. However, the long term effects of this are unknown and treatments for colonic ulcers have not been considered.

In an effort to support a healthy and functioning digestive tract in performance horses prone to ulcers, colic and other GI health issues, a feed supplement to target each aspect of the digestive tract was developed. The intention was to create a digestive conditioning program that would normalize conditions in the GI tract while horses continue to be rigorously trained and live under the stressful conditions of modern performance horse care.

This experiment was conducted to evaluate the efficacy of this feed supplement on supporting overall digestive tract health by focusing on incidence and severity of gastric ulcers and on the incidence of digestive tract blood loss as measured by fecal occult blood.

Methods: Sixty active racing standardbred horses at a single stable in Ohio were used for this experiment.

Twenty horses were randomly assigned to each of 3 test groups (Control, Half Dose, Full Dose) and monitored for a period of 90 days. Control group received no feed supplement, Half Dose received 14 grams of the supplement once per day for 90 days, and the Full Dose group received 28 grams of the supplement once per day for 90 days. At times 0, 30, 60 and 90 days, all horses in the study were scoped for gastric ulcers using a standard 3-meter endoscope. Ulcers were noted, along with their severity using the standard 0-4 grading system (MacAllister, et al 1997). Additionally, manure samples from all horses in the study were collected at 0, 30, 60, and 90 days and tested for occult blood using a standard guaiac-based fecal occult blood test.

Results: Full Dose and Half Dose treatments exhibited a dosage-dependent improvement in gastric ulcers, reducing the average severity to less than 0.5 by the end of the study (Figure 1). This same dosage-dependent reduction in fecal occult blood was also seen (Figure 2). The control group exhibited no improvement in either factor.

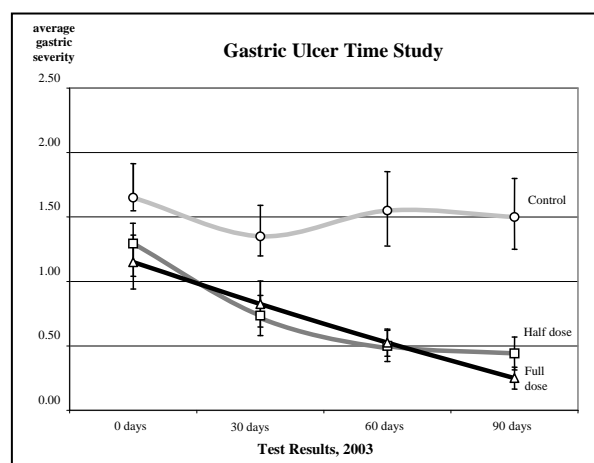


Figure 1. Average gastric ulcer severity showed a dosage-dependent decrease among horses fed the nutritional supplement, with virtually no improvement among horses in the control group.

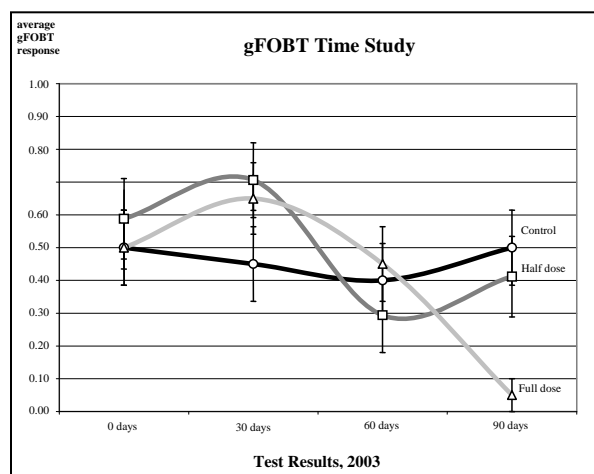


Figure 2. A dosage dependant decline in appearance of fecal occult blood as detected by guaiac acid based tests.

Discussion: Feeds are not medicines but good feed management is probably the best long-term solution to many digestive problems, including ulcers. Ironically, feed is also the main culprit in many of these disorders. This is because trainers of performance horses often put the animals on hard feed in order to guarantee high energy concentrations for maximum performance. But in addition to giving the horses extra energy, hard feeds also allow large quantities of sugars to be released in the mouth.

Horses have evolved to eat large quantities of grass, and in the process they produce gallons of saliva daily. But when it is allowed to chew only small amounts of hard feed, a performance horse doesn't generate enough saliva to buffer the high levels of acids that are produced daily. Hard feeds add to the acidity of the stomach, which in due course challenges the stomach wall. Together with stress and exercise, this can lead to stomach ulcers. Further, the recent findings on the incidence of colonic ulcers suggest that the entire digestive tract of the horse must be considered in addressing gut health.

During the period of this study, a guaiac-based fecal blood test (gFOBT) of the manure was conducted to measure bleeding from any source along the digestive tract. In humans, the guaiac test can produce false positives when exposed to blood from, for instance, the previous night's steak dinner or other peroxidase-containing entrées. It has been supposed that the guaiac test might be skewed toward false positives in horses as well – perhaps due to chlorophyll or other peroxidase-mimicking molecules in their feed. But a recent study by one of the authors found no false positives comparing guaiac readings with gross observation following necropsy (Pellegrini 2005). Instead it showed a high significance (100%) and high specificity (100%) between gastric or colonic ulceration and a positive guaiac stain. Interpreted in this light, the gFOBT data collected in this study served as a proxy for colonic and other non-gastric

ulcers. This information, together with endoscopy findings regarding gastric ulceration, may provide a more complete picture of the horse's digestive health.

A natural diet supplies substances that support the integrity of the GI tract. However, in emphasizing performance, many manufactured feedstuffs end up being deficient in naturally occurring nutrients that are needed to maintain the health of a horse. Further, these substances may not be in sufficient supply to meet the needs of a horse under the stresses and rigorous demands of performance training.

Vitamins and minerals are typically added to equine diets in an attempt to correct these shortcomings. When various nutrients are compounded to address a specific function – such as immune response or tendon healing – it is called functional feeding, and the formulation is called a nutraceutical. But before any functional feeds can have an effect, the gut itself must be in good shape. Therefore, a nutraceutical that addresses the proper functioning of the gut provides a necessary foundation for all other functional feeds.

Such a gut-oriented functional feed would include specific prebiotics, amino acids, nucleotides, polar lipids and antioxidants. With such a nutraceutical, the health of the GI tract can be actively managed, protecting the gut wall from attack by acids, pathogens and toxins and promoting the regeneration of intestinal tissue cells. The nutritional supplement tested in this study contains beta glucan, a soluble fiber derived from the bran of oats, polar lipids, fatty acids derived from the oil of oats, the amino acids threonine and glutamine, and yeast sugars called mannan oligosaccharides (MOS).

Pasturing a horse can improve its digestion by eliminating stress and providing a more natural feeding method, but it doesn't provide the energy density needed for a performance horse. In the absence of the ideal natural feeding environment, a functional feed is essential. Results of this study demonstrate that modifying the animal's feed ration can have a significant effect on the presence and severity of both gastric ulcers and digestive tract bleeding.

In today's high performance horse world, ulcers are ubiquitous and colic is the number one killer. But with the proper functional feeding program, the equine GI tract can quickly recover from insults even during strenuous training, allowing the horse to operate at the absolute peak of its abilities.

References:

- McClure SR, Glickman LT, Glickman NW. *Prevalence of gastric ulcers in show horses.* J Am Vet Med Assoc 1999;215:1130-1133.
- Traub-Dargatz JL, Koprak CA, Seitzinger AH, Garber LP, Forde K, White NA. *Estimate of the national incidence of and operation-level risk factors for colic among horses in the United States, spring 1998 to spring 1999.* J Am Vet Med Assoc. 2001 Jul 1;219(1):67-71.
- Pellegrini, Franklin L. *Results of a Large-Scale Necroscopic Study of Equine Colonic Ulcers.* J Equine Vet Sci 2005; 25 (3) 113-117.