A Comparative Study: Effects of Two Products 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 2-3 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. Some of these products generally work by buffering the acid in the stomach (e.g., bismol, calcium antacids, sucralfate). Another specific category is proton-pump inhibitors (PPIs), a class of drugs that block the production of stomach acid. These are typically prescribed for horses that are known by endoscopy to have ulcers, but are also prescribed for non-specific ailments on the theory that if improvement is noted, then an ulcer was likely to blame. PPIs 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 (available commercially as SUCCEED® Digestive Conditioning Program®). 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/or live under the stressful conditions of intermittent feeding and limited turnout.

This comparative study was conducted to evaluate the efficacy of this feed supplement relative to a PPI (omeprazole) 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, omeprazole, supplement) and monitored for a period of 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: The supplement treatment group exhibited a major improvement in gastric ulceration, (Figure 1). A similar reduction in fecal occult blood was also seen (Figure 2). The omeprazole group showed a rapid reduction in gastric ulcer severity from days 0 to 30, but leveled off over the remainder of the study. The average gFOBT response increased significantly over the length of the study, suggesting increased compromise of the colon. The control group exhibited no significant change in either factor.

Figure 1. Average gastric ulcer severity: decreased initially then leveled off in the omeprazole group, decreased over time in the supplement group, and showed virtually no improvement in the control group.
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 gFOBT 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.

The use of proton pump inhibitors, including (and particularly) omeprazole, has become extremely common as both treatment and diagnosis for symptoms that indicate gastric ulcers. This study raises questions about the long term use of this class of drugs, especially in terms of hind gut health.

A natural diet supplies substances that support the integrity of the GI tract. However, in emphasizing performance, many manufactured feeds end up being deficient in naturally occurring nutricines 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.

When various nutricines 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. 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 includes specific prebiotics, amino acids, nucleotides, polar lipids and antioxidants. With this, 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 (SUCCEED®) 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:

