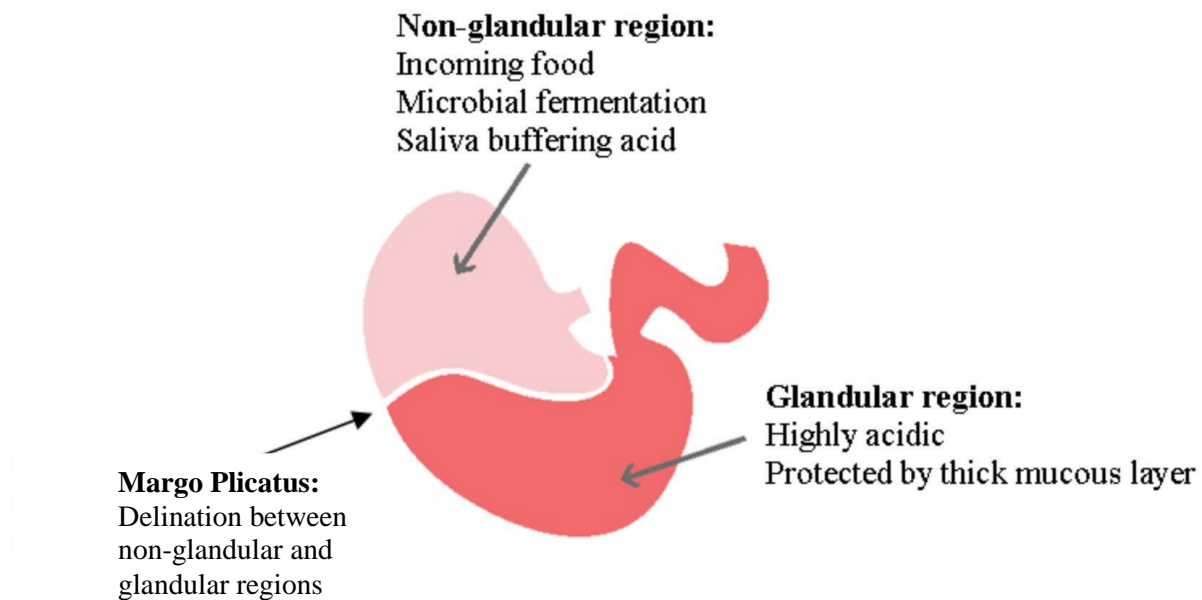


Equine Gastric Ulcer Factsheet

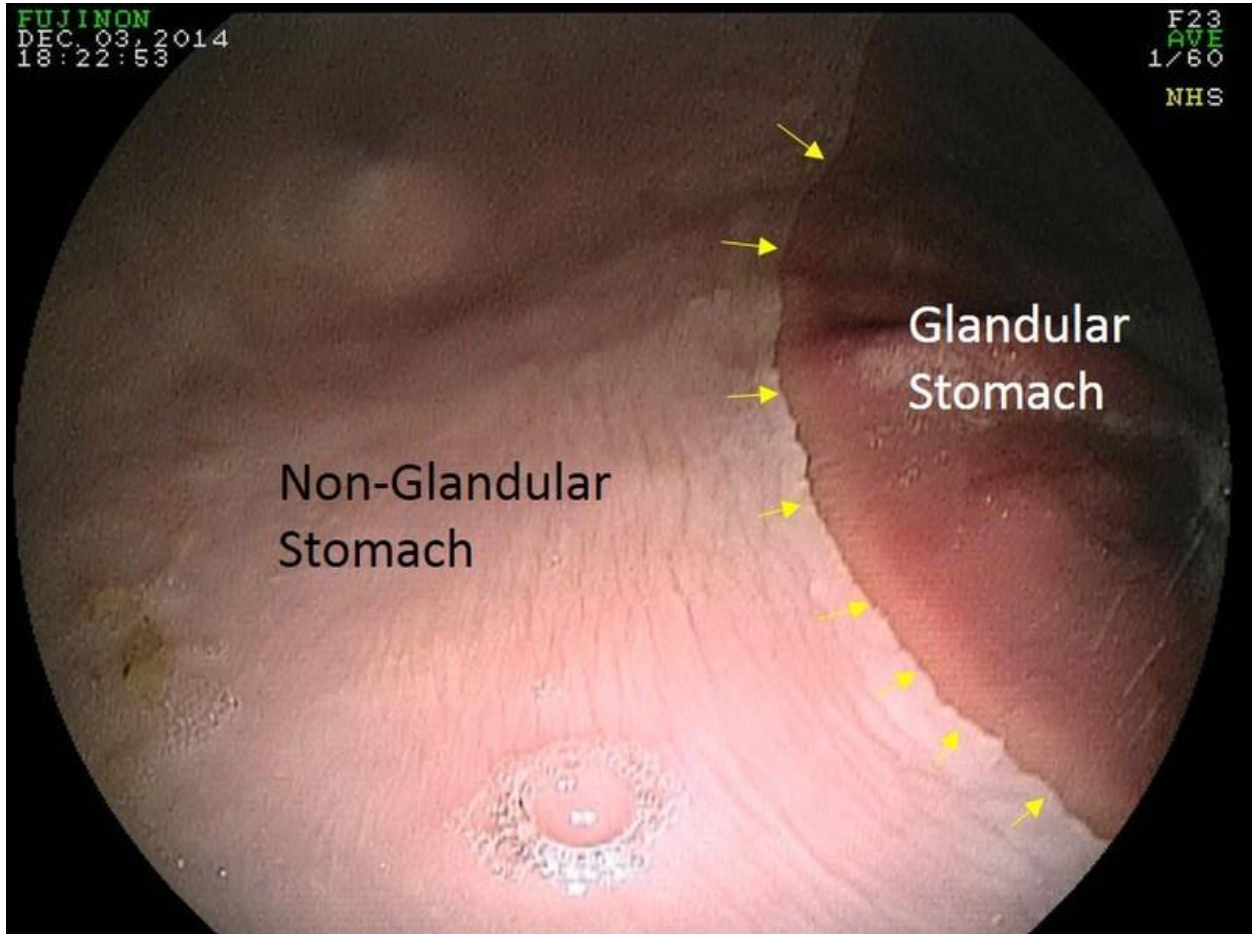
Equine Stomach Anatomy

The equine stomach is a single large compartment that can be divided into two main regions.

- Top 1/3 is the non-glandular portion which is covered in squamous epithelium, and produces no glandular secretions.
- The margo plicatus is the line of demarcation between the non-glandular and glandular regions.
- The bottom 2/3 is the glandular portion that secretes stomach acid, and is lined with a protective layer of mucus.
- Ulcers can be present in both areas of the stomach, although they occur through different pathologies.
- Ulcers in the non-glandular portion are more common and better understood.



View of the Equine Stomach through an Endoscope



**Etiology (the cause, set of causes, or manner of causation of a disease or condition)
of Equine Gastric Ulceration Syndrome:**

- Horses secrete gastric acid continuously, unlike humans, who secrete in response to eating. Under normal conditions, food in the stomach acts to buffer the acidity. Squamous ulceration occurs when the largely defenseless tissue is exposed to acidic gastric contents.
- Exercise results in acid splash of the low pH contents of the glandular region into the unprotected squamous portion
- Risk factors include exercise, high concentrate/low roughage diets, transport, stall confinement, and intermittent access to water.
- Highest prevalence is found in horses that are intensively managed and performing high intensity exercise. One study found a prevalence of 70% in Thoroughbred racehorses; another found the prevalence to be 93% in competitive endurance horses. That does not mean it is never found in horses on pasture, however. Rates as high as 53% have been found in pleasure horses, and even donkeys have been found with gastric ulcers.
- Glandular ulcers are thought to be associated with a breakdown in the mucosal defence mechanisms such occurs when on long term treatment with NSAIDs such as phenylbutazone. The mechanism that produces glandular ulcers is not as well understood.
- Gastric ulceration can occur as a primary disease or as a secondary disease related to delayed gastric outflow.

Clinical signs

- Clinical signs are extremely varied but can include reduced feed intake, recurrent mild colics, weight loss, poor hair coat, poor performance, and girthiness.
- The severity of clinical signs does not correlate well with ulcer severity. Some horses may not show any clinical signs at all, but their behavior does change after ulcers are treated, indicating that subclinical disease also occurs.

Diagnosis of Gastric Ulcers in Horses

- Gastroscopy is the examination of the stomach through a 3m -long endoscope. This is the way we can definitively diagnose gastric ulcers. It allows us to confirm the presence of ulcers and to evaluate their severity and location. It also allows us to rule out other diseases that can have similar presenting complaints, such as gastric impaction.
- Fecal occult blood tests were not found to be accurate when compared to gastroscopy results, because unlike in humans, bleeding ulcers are rare in horses.
- Therapeutic trials (treating suspected gastric ulcer cases instead of diagnosing by gastroscopy) can be misleading. A positive response to treatment increases the index of suspicion, but does not confirm gastric ulceration. Other things may have changed over a four week course of treatment and altered the various clinical signs thought to have been caused by ulcers. A positive response to treatment also does not differentiate between squamous and glandular disease. Glandular disease takes significantly longer to heal than squamous disease.

Management and Treatment of Gastric Ulcers

- Omeprazole is the most effective drug for acid suppression in horses.
- It does not directly contribute to healing, but instead removes the constant insult of acidity on the squamous epithelium, which is then able to heal on its own.
- A treatment course of 28 days with Gastrogard has reported healing rates of 70-77% in squamous ulceration.
- This means 20% of animals will not heal in the prescribed treatment course. Discontinuation of the treatment at this time renders previous treatment useless. This is why we might suggest performing another gastroscopy at the end of a treatment regime.
- Compounded omeprazole products are documented to be less efficacious than Gastroguard, likely due to differences in bioavailability and stability of the product. Omeprazole will be broken down in the presence of acid, so it needs to be formulated in a way that it can pass through the stomach intact to be absorbed in the small intestine.
- Supplements and antacid treatments are very popular among owners. While antacids can reduce gastric acidity, their effect is very short lived (approximately 2 hours) and makes their use impractical.
- Many of the risk factors for gastric ulceration are management issues. To manage a horse with gastric ulcers, provide access to hay in multiple locations to increase time spent grazing. Decrease the soluble carbohydrate (grain) portion of the ration, and add vegetable oils to balance caloric intake. Increase the availability of turnout; provide constant access to water, and feed a small roughage based meal 30-60 min prior to turnout.
- Removal of risk factors and a decrease in the intensity of exercise is often not enough to heal gastric ulcers; in these cases, acid suppression therapy is required. This is particularly true for horses with weight loss and decreased appetite.
- Spontaneous healing occurs at rates of 9-33% under field conditions.
- A recent study has shown that some supplements may be beneficial in the treatment and prevention of gastric ulcers, but more study is required. Consistency and quality control of nutritional supplements is not regulated in Canada, so results can be highly variable.

Feeding to Prevent Gastric Ulcers

- One study showed that pH in stomach was higher (i. e. less acidic) when alfalfa hay was fed vs grass hay
- Conversely, another study showed a higher incidence of stomach ulcers when horses were fed alfalfa chaff. This may have been an effect of fine particles rather than the type of hay.
- High forage, low concentrate (<0.5% of body weight as concentrate) diets are beneficial.
- Feed smaller, more frequent meals. Grain should ideally be split into 3 meals, not to exceed 0.5 kg/100 kg body weight per day.
- Antibiotics and probiotics have been shown to have a beneficial effect in treatment of chronic non-healing ulcers. These should only be used when acid suppression and dietary management are insufficient. Antibiotics should only be used under the direction of your veterinarian, who will carefully assess the need.
- Sea Buckthorn berries have been suggested as a treatment. Two studies showed no effect, and one later study on a different product showed significantly lower gastric ulceration scores
- Calcium carbonate, an antacid, has a short duration effect of approximately 2 hours.
- Pronutrin : Two studies showed this pectin/lethicin supplement to have positive effects in horses with clinical disease. Studies on two other pectin/lethicin products showed no clinical effect.
- Zinc and other complexed minerals in one study showed lower ulcer scores after omeprazole treatment
- Corn oil has been shown to decrease gastric acid output; however, in another study, it did not appear to improve ulcer scores.
- When feed is withheld from horses prior to exercise or due to management (horses being fed hay twice daily) it has been found that the gastric acidity rises rapidly. In fact, feeding forage in any manner other than free choice increases the likelihood of squamous ulcers fourfold. Horses fed hay once daily were at higher risk than horses fed hay twice daily.
- Stall confinement alone does not seem to cause ulcer formation, unless confinement contributes to stress.
- Diets containing 2.5 kg (5.5 lbs) and 0.5 kg (1.1 lb) starch per meal increased the risk of gastric ulcers.
- Grain meals stimulate more gastric acid production, and as this production is slightly delayed, gastric acid production is increased when the stomach is likely to be already emptied.