


# Omeprazole for Horses with Ulcers: the Good, the Bad, and the Questionable

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Omeprazole is a medicine classified as a *proton pump inhibitor* (PPI), and its purpose is to block stomach acid production. Omeprazole is also known in the equine industry by its trade names: *GastroGard* and *UlcerGard*.

We may think of these products for horses interchangeably, yet the FDA has given approval for GastroGard as a **treatment** for gastric ulcers, and UlcerGard as a **preventative** drug for gastric ulcers.

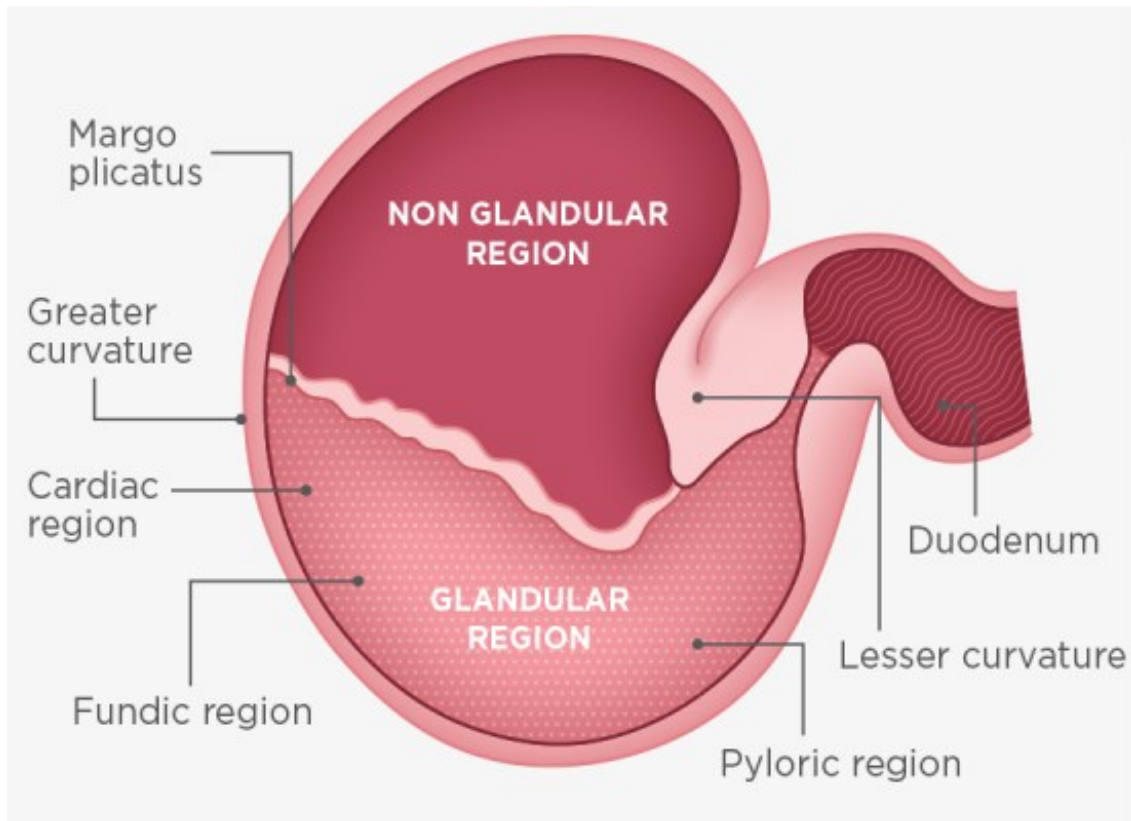
The difference between the two drugs is not simply price: GastroGard provides 4mg/kg of omeprazole while UlcerGard contains 1mg/kg of omeprazole.

## Effectiveness of omeprazole

Omeprazole has proven to be extremely effective in treating **squamous** ulcers, which are ulcers occurring in the upper one-third region of the stomach.

However, omeprazole has *not* been effective in treating ulcers in the **glandular** portion of the stomach. The glandular region comprises two-thirds of the stomach area.

According to an omeprazole study from 2015, "as many as 36% of the glandular ulcers actually worsened over the 28 days of the study, without any association to the dose level."



## The effects of omeprazole in the body

Omeprazole is capable of reducing hydrochloric acid in the stomach by up to 99%. While this action is beneficial for healing ulcers in the squamous portion, there are ramifications.

- Stomach acid is needed by horses to digest proteins.
- Stomach acid helps create a hostile environment so certain pathogenic bacteria cannot flourish.
- Stomach acid activates *pepsin*, an enzyme that breaks protein into amino acids.
- The suppression of digestive acids by omeprazole affects key mineral absorption of *calcium* and *magnesium*.
- A small digestibility trial by Kentucky Equine Research showed that two weeks of omeprazole administration decreased calcium digestibility by 20% for calcium carbonate, and 15% for marine-derived (seaweed) calcium.
- Blocking stomach acid for a period of time can cause the body to increase production of stomach acid after omeprazole treatment. This can lead to heartburn and dyspepsia which help to form new ulcers.
- A study on omeprazole published in the Journal of Equine Veterinary Science concluded: *"Oral administration of omeprazole in healthy equines interfered with the metabolism of digestive biomarkers of lipid, mineral and protein metabolism, although the animals were treated for a maximum of 11 days. Horses treated with a proton-pump inhibitor need to be evaluated regularly to avoid significant modification in their metabolic parameters."*

## Short term use of omeprazole

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Remember that short term use of omeprazole (30-60 days) is less likely to be problematic than long term use. Even with short term omeprazole administration, ample amounts of calcium and magnesium must be supplied by either legume hay, alfalfa pellets/cubes, or a bioavailable mineral supplement. Ideally, an omeprazole dose should be given between feedings in order to maximize calcium and magnesium digestibility.



## Long term use of omeprazole

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Many competition horses are given omeprazole every day in the management and prevention of ulcers. This is where omeprazole can become more problematic. Unfortunately, no long term studies on omeprazole in horses have been published.

## Studies on humans in long term use of omeprazole

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Studies conducted on the long term consequences of omeprazole use and other proton pump inhibitors in humans have shown:

- Malabsorption consequences in regards to *calcium* and *magnesium*
- Increased infections such as *clostridium difficile* and *pneumonia*

Long term proton pump inhibitor use in humans is associated with an increased risk of osteoporosis and decreased bone mineral density with a 35% increased risk of fractures.

A meta-analysis study from Washington University, St. Louis, 2017, found an increased risk of death among proton pump inhibitor users.

*"People have the idea that PPIs are very safe because they are readily available, but there are real risks to taking these drugs, particularly for long periods of time." Ziyad Al-Aly, MD, associate professor of medicine.*

The researchers also found that the risk increases with the duration of PPI use, even when the drug is taken at low doses (Sauerwein 2019).

## **Horses and humans require stomach acid**

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Some might brush the human studies aside as not relevant to horses; the GI tracts of both species, while similar, are also very different. Horses are hindgut fermenters, humans are not.

However, humans and horses need stomach acid as part of the digestion process. Horses produce stomach acid all the time, not just when they eat. The act of chewing forage or hay increases the production of bicarbonate in the saliva, thus providing a natural buffering of the stomach acid.

## **Bone remodeling**

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While research is ongoing, several studies indicate that omeprazole decreased the activation of both the osteoclasts (cells that breakdown bone) and osteoblasts (cells responsible for bone formation).

Horses with navicular changes (the result of increased osteoclasts and decreased osteoblasts) could be affected by prolonged use of omeprazole.





## Fatal injuries in thoroughbred racing

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The thoroughbred industry is beginning to take a hard look at the long term use of omeprazole, particularly as the drug can affect bone remodeling and bone density. The result of calcium loss from omeprazole combined with administration of Lasix may be large contributing factors to increased fracture rates in thoroughbred racehorses ([Casner 2019](#)).

## The importance of calcium and magnesium

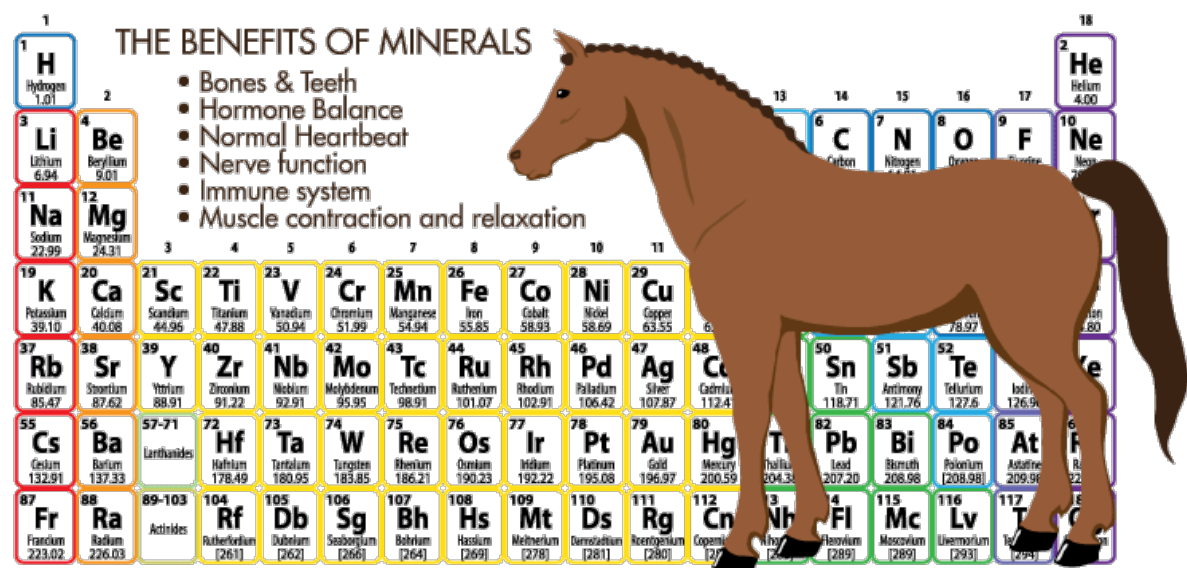
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Thirty-five percent of the horse's body contains calcium. This important mineral is needed not only for bones and teeth but also for muscle contraction, blood clotting, enzymatic functions, and cell membrane functions.

Magnesium plays important roles in nerve and muscle function. Along with calcium, it is one of the major minerals in bone.

While calcium is critical for muscle contraction, magnesium is critical for muscle relaxation.

Calcium is an important stomach acid buffer but unlike omeprazole, it does not stop the production of stomach acid. When calcium buffers stomach acid, the body is still able to digest proteins and absorb minerals.



## Stomach ulcer recurrence: the merry-go-round

Once a horse has been treated and healed with omeprazole for squamous ulcers, there is often a recurrence of ulcers. This is due to a phenomenon known as *Rebound Acid Hypersecretion* (RAHS). The body actually *increases* acid secretions after omeprazole treatment. The increase in acid can cause heartburn, acid regurgitation and dyspepsia, leading to formation of new ulcers.

Typically, the horse will resume treatment with omeprazole once again, restarting the cycle.

## Omeprazole and the hindgut

Some veterinarians have questioned whether omeprazole has contributed to the rise in hindgut ulcers; however, there are no published studies on this possible correlation. Omeprazole must survive the stomach's acidic environment to reach the small intestine, where it blocks the signal for acid production. The small intestine is where starches, sugars, proteins, and fats are absorbed.

When horses are fed high-grain meals, some of the starches are not digested in the small intestine and wind up in the hindgut. The hindgut digests fiber, not starches and sugars. This starch overload in the hindgut then leads to imbalances in the microflora, resulting in hindgut acidosis.

A published [study on dogs](#) showed that omeprazole *“leads to quantitative changes in GI microbiota of healthy dogs.”*

## Our reliance on omeprazole

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Omeprazole is the go-to drug for gastric ulcers, as it has helped thousands of horses heal squamous ulcers. But are we overusing it? Often we see signs of an ulcer in our horses and we start the GastroGard without question. However, if the ulcer symptoms are from the glandular portion of the stomach, GastroGard will be ineffective.

We give UlcerGard when our horses compete to prevent ulcers from forming. Horses that compete frequently may be getting UlcerGard for several weeks in a row.

When the UlcerGard is stopped for a few days between shows, or a few weeks, we may have raised the recurrence rate of ulcers because the omeprazole caused the body to hypersecrete more acid.

Do we really want a preventative that blocks the absorption of calcium and magnesium, and which affects digestion of proteins?

We need to start questioning our possible overuse of omeprazole, particularly as a preventative. We need to seek out alternatives.

## Prevention of ulcer recurrence

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[Ongoing research](#) is showing that pectin and lecithin combined with polysaccharides from [medicinal mushrooms](#) help stabilize and protect the intestinal mucosa, including the glandular region of the stomach. There are other alternatives to keep in mind as well:

- Bioavailable calcium from alfalfa, or algae, or eggshell matrix can buffer stomach acid and help reduce the recurrence of squamous ulcers without stopping the production of acid.
- Dietary concentrates such as feeds with high grain content and high [NSC](#) decrease the horse's production of saliva therefore reducing the natural bicarbonate function.
- Switching to low-NSC feeds can help reduce ulcer recurrence because sugars in high NSC feeds can be fermented into acid in the stomach. Thereby increasing acid content of the stomach.
- *Aloe vera*, particularly medical grade, can be a protective supplement for gastric ulcers. However, *aloe vera* has not been clinically shown to heal existing ulcers.



- Slippery elm bark contains polysaccharides, similar to medicinal mushrooms, and can be protective for the intestinal mucosa.
- Cabbage is a whole food source of the amino acid glutamine and may help promote intestinal mucosa healing. Dehydrated or freeze-dried cabbage is a better choice than fresh cabbage.
- Chia and flax are mucilaginous and high in omega 3's which may help to reduce inflammation.



## Gastrointestinal Support to Reduce the Recurrence of Gastric Ulcers

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Omeprazole is an important medication that needs to be used judiciously. *Once active gastric ulcers are healed* it's possible to reduce recurrence with management and science-based supportive foods and plants.

**Optimum GI™** from BioStar provides gastrointestinal support with vitamins, antioxidants, minerals, essential fatty acids, and highly digestible protein for whole horse health. This multivitamin & mineral supports a horse's sensitive mucosa without interfering with normal digestive activity.





**Tum Ease EQ™** from BioStar provides organic dried cabbage, one of the best sources of the amino acid Glutamine, long studied for its benefits to intestinal mucosa. The formula also provides micro-crystalized aloe vera, which provides a soothing action against excess acid. Tum-Ease also contains papaya, which supports membranes in the esophagus and stomach.



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