

# WHAT'S NEW IN THE PREVENTION OF GASTRIC ULCERS ?

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the middle of a competition when the pain became too acute.

## Are ulcers a frequent problem in horses ?

Several studies carried out in different populations of horses agreed in demonstrating that the presence of ulcers in horses is far more frequent than one could imagine and that it is intimately linked to their way of living and their level of work. Horses that live out in pasture are at the lower end of the ulcer scale: less than 5% of grazing horses do suffer from ulcers. However the more intense their work becomes, the higher their chances are of having gastric ulcers (Figure 1). In endurance horses, for which feeding management is a key to ensuring competitiveness, the proportion of horses suffering from ulcers exceeds 65%. A study carried out in a population of young thoroughbreds in training revealed that the incidence of gastric ulcers could reach as high as 99% when they entered racing competition!

## Can horses suffer from gastric ulcers ?

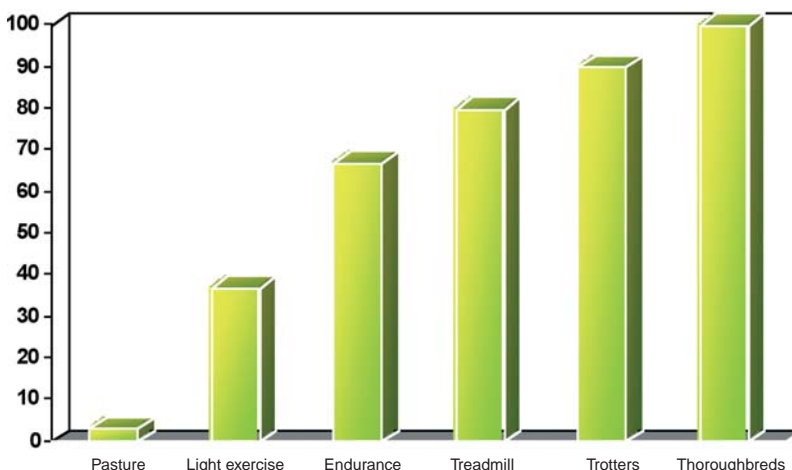
With the development of gastric endoscopy in the equine species, veterinarians have discovered that many horses suffered from gastric ulcers. In some cases, the presence of ulcers could not have been initially suspected, as some horses hardly expressed signs of discomfort or pain. The nature of clinical symptoms in a horse suffering from ulcers can be very variable and sometimes subtle, ranging from yawning during meals to clear colic in the most sensitive horse. Horses with ulcers can also grind their teeth or crib bite, others will frequently interrupt eating, leave grain in their manger or drink more than they used to.

Obviously gastric ulcers can have a detrimental impact on the performances of sport horses, mainly because of the pain they are likely to trigger during work but also during meals. The horses suffering from ulcers can loose state, they can show dull hair, weight loss, and lack in

muscular development although their work load is sustained. They can also come short of energy during work or even intolerant to exercise. Some horses have been known to stop in



Figure 1: Prevalence of gastric ulcers in horses



### Why do horses develop gastric ulcers ?

Despite their size, horses have a proportionally small stomach. In their natural environment, horses spend their time eating grass, which transits rapidly through the stomach. Unlike other species whose stomach produces acid only during meal times, the equine stomach produces acid continuously. If a horse is fed only twice a day, and moreover if its diet is mainly composed of concentrates, food will be quickly digested and the horse will go on an empty, acid-producing stomach. Without food to digest, the acid can

irritate or even attack the walls of the stomach, eventually resulting in the occurrence of ulcers. Providing sufficient fibre source is an essential element in a horse's diet, the more so if the animal is kept in a box on a non-edible bedding (wood shavings or cardboard for instance). As fibres are digested more slowly, the stomach stays fuller for a longer period of time.

Several studies have shown that the incidence of ulcers is proportional to the level of work. Stress clearly can be a major promoting factor as it interferes with physiological mechanisms of mucosal protec-

tion and acid regulation. But stress is not the only likely cause. Physical activity brings the most acid-sensitive portion of the stomach's mucosa into prolonged contact with the gastric acid content. In a scientific study, horses were intubated with a catheter placed inside the stomach while exercising on a treadmill. The study showed that the acidity (determined by the measurement of intra-gastric pH) in the most sensitive portion of the stomach increased with increasing pace.

In humans, gastric ulcers are mainly caused by an infection with a bacteria named "Helicobacter pylori". Thus patients can be efficiently treated simply by taking antibiotics. These particular bacteria have rarely been isolated in horses, at least not in their active, pathogenic form.

### What are the solutions?

Gastric ulcers seldom heal spontaneously in horses. To initiate a healing process, the horse's living and working conditions have to be completely reassessed. The most efficient measures are also the most radical: a prolonged stay out at pasture can allow an ulcer-affected horse to fully recover, as well as reducing significantly its workload, the frequency of competitions and transportations. Other simple measures can also contribute to relieve the horse and avoid a worsening of the ulcers like, for instance, dividing the horse's daily ration into smaller but more frequent meals and to ensure a permanent availability of forages. But how can owners or trainers apply such measures to their sport horses when the competition season is in full course?

There are some efficient medical solutions represented by anti-acid substances. These substances block totally or partially the acid production inside the stomach. Amongst these are found the H2-receptor inhibitors, like ranitidine or cimetidine, or the proton pump inhibitors like omeprazole. Omeprazole has become a standard treatment of gastric ulcers in foals and in horses suffering from extensive and/or deep mucosal ulcerations. The price of these substances can be a limiting factor in their use, as well as the fact that they cannot avoid the recurrence of ulcers, which are unfortunately quite fre-



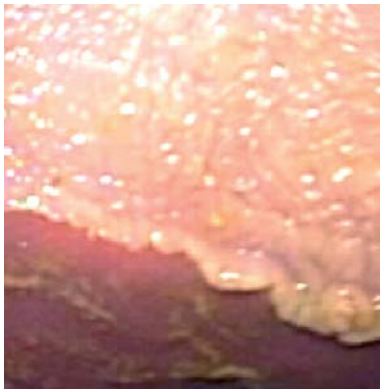


Photo 1 : Gastrosopic image at the level of the stomach margin (*margo plicatus*) in a healthy horse. The non glandular mucosa is located in the upper part of the picture (light pink), and the glandular portion in the lower part (dark red).



Photo 2 : Grade 2 ulcers (on a scale of 4) at the level of the stomach margin in a horse.

quent. The use of these substances is also under strict regulation for most competitions.

TWYDIL® has recently developed and tested two products to provide relief against low grade to moderate gastric ulcers in horses. The originality of these products is to provide a feed supplement to help solve the problem of ulcers in horses, thereby allowing them to continue competition. To validate the efficiency of these products, the study was undertaken in a population of horses at a high risk – working sport horses. Supplementa-

tion 1 contained fatty acids specifically formulated and supplementation 2\* long chain fatty acids coupled with phospholipids on a soluble fibre base type chitosan glucosamine.

Thirty horses were selected for this study; these horses were either sport horses in training referred because they manifested one or several clinical signs suggestive of gastric ulcers, or race horses undergoing routine endoscopic examination (with or without clinical signs suggestive of gastric ulcers). In all horses, the diagnosis of ulcers was

confirmed by a thorough endoscopic exploration of the entire stomach (i.e. gastroscopy), from its entrance represented by the cardia, to the pylorus, which is the stomach's exit. A score was attributed to the severity of the lesions, according to a standardised international scoring system, with a scale ranging from 1 to 4. The TWYDIL® STOMACARE was only tested in horses suffering from ulcers with scores of 1 to 3. Score 4 ulcers being the most severe, a medical treatment was a prerequisite.

Horses underwent a first endoscopic examination and were then re-examined after 15 days and 1 month of supplementation. The horses were divided into 2 groups in a double-blind study : group A received 15 days of supplementation 1 then 15 days of supplementation 2\*; group B received 15 days of supplementation 2\* then 15 days of supplementation 1. The gastroscopy videos were subsequently and independently examined by two veterinarians unaware of either horses or supplementation.

Out of the 30 horses examined, 74% presented ulcerative lesions in the stomach; amongst those 57% had clinical signs suggestive of gastric ulcers (erratic appetite, lack of energy during work, dull coat, teeth grinding, etc...). On the other hand, 43% of these horses did not manifest any evident clinical signs, even though some had relatively high ulcer scores.

The stomach is composed of two parts: a non-glandular part that serves as a stocking area, and a glandular part that produces acid. In agreement with previous publications, it was noted that the most vulnerable area of the stomach was the non-glandular mucosa lining the glandular region. This danger zone, called the stomach's margin (*margo plicatus*), is the area the most likely to be exposed to the acid content of the stomach. All the horses examined in this study had lesions in that border area, sometimes associated with lesions in other portions of the stomach.

After 15 days of supplementation, a significant reduction of the severity of the lesions was observed. A decrease of 54 and 76% in ulcer scores was noted depending on the supplementation used (Figure 2).

TABLE 1. STUDY LAYOUT

Day 0 (J)	<i>Clinical exam Initial gastroscopy</i>	
	<b>Group A</b>	<b>Group B</b>
	Supplementation 1	Supplementation 2*
Day J+ 15 days (J15)	<i>2<sup>nd</sup> Gastroscopy</i>	
	Supplementation 2*	Supplementation 1
Day J + 30 days (J30)	<i>3<sup>rd</sup> Gastroscopy</i>	

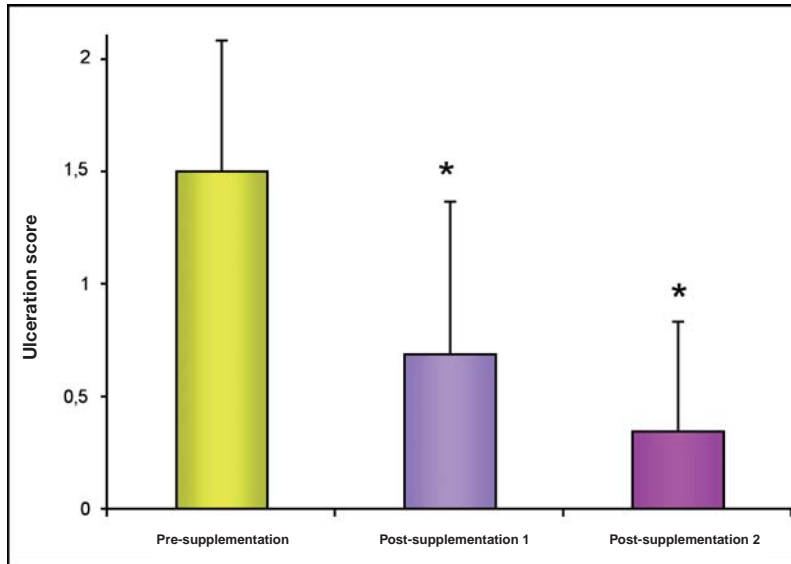


Figure 2 : Global effects of supplementaton 1 and 2\* on ulceration scores (presented as mean values and standard deviations). \* signs indicate a statistical difference compared to pre-supplementation scores (p<0,001).



Photo 3 : Pathological hyperplasic reaction of the non glandular mucosa : the wall is thick and sloughs.

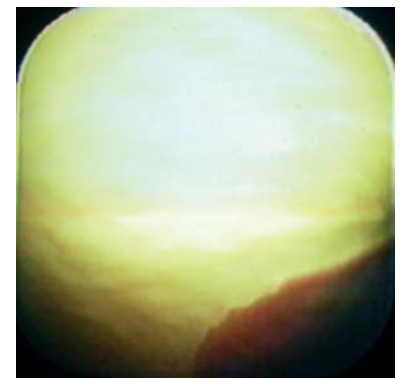


Photo 4 : Healing of the non glandular mucosa after a supplementation with TWYDIL® STOMACARE : the mucosa is uniformly regenerated.

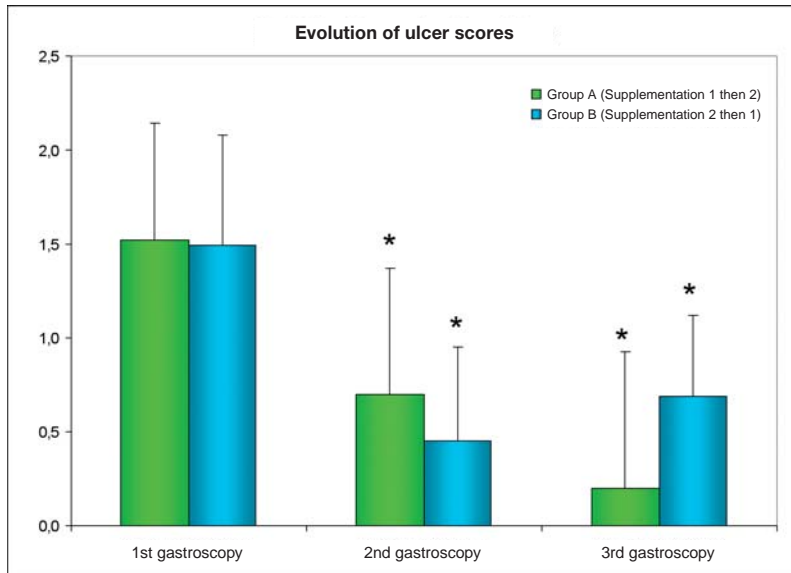


Figure 3 : Evolution of ulceration scores in groups A and B at each endoscopic examination. Group A received 15 days of supplementation 1 then 15 days of supplementation 2\* ; Group B had 15 days of supplementation 2\* then 15 days of supplementation 1. Data is expressed as means and standard deviations. \* signs indicate a statistical difference compared to pre-supplementation scores (p<0,001).

After a month of supplementation, improvement was confirmed in all horses without exception, with a complete healing of the ulcers in 43% of the cases. Both supplementations showed a statistically significant efficiency in improving moderate ulcerative lesions of the equine

stomach, with a more manifest effect with the supplementation 2\* in comparison to supplementation 1 (Figure 3). In two horses suffering from ulcers in the glandular portion of the stomach, a complete recovery was obtained as well.

When performing the gastroscopic

recordings, a complete and homogeneous regeneration of the non-glandular mucosa was observed, promoting ulcer healing (Photos 3 and 4). The renewal of the non-glandular mucosa helped to improve the lesions of the stomach margin, that area of the stomach most exposed to the occurrence of ulcers. This regeneration phenomenon could be due to the high content in fatty acids of both supplementations tested. Fatty acids are constituents of the cellular membranes as well as of factors that are involved in mucosal protection and regulation of gastric acidity, such as several prostaglandins.

A high degree of satisfaction was also obtained from questioning the owners after one month of supplementation: 80% declared themselves satisfied with the supplementations undertaken. In 50% of the cases, they noted a marked improvement of spe-



cific clinical complaints (disappearance of colic signs during meals, increase in appetite, weight gain, etc...).

**CONCLUSIONS**

This study allowed to demonstrate the efficiency of supplementations 1 and 2\* in the improvement, and in some cases the complete healing, of moderate gastric ulcer lesions in sport horses – a population particu-

larly at risk. The results obtained with supplementation 2\* were superior to those obtained with treatment supplementation 1.

This study opens the perspective of the use of an adapted\* food supplement in the management of stomach ulcers in horses, both for preventing their occurrence as well as for avoiding their recurrence.

Due to their controlled composition, these supplements can be given without risk up to the day of the competition.

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\* Supplementation 2 = TWYDIL® STOMACARE



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