



## RESEARCH >

# RESEARCH >

### Alterations in Equine Gastric pH by Purina® Outlast™ Gastric Supplement

A SUMMARY OF RESEARCH CONDUCTED BY PURINA ANIMAL NUTRITION IN CONJUNCTION WITH LOUISIANA STATE UNIVERSITY, EVALUATING THE EFFECTS OF FEEDING A PROPRIETARY MINERAL COMPLEX ON GASTRIC pH IN THOROUGHBRED HORSES.<sup>1,2</sup>

#### < INTRODUCTION >

Horses evolved as grazing animals and as such, are meant to devote much of their day to trickle feeding or chewing feedstuffs in small amounts over long periods of time. To that end, horses constantly secrete stomach acid to assist with the digestion of their feed and forage, which is naturally buffered by bicarbonates secreted in saliva as horses chew. In modern management practices, however, horses spend more time confined and eating distinct meals of feed, which can lead to less chewing and higher levels of acid in the stomach. In addition, exercising horses during periods of high stomach acidity has been attributed to increased gastric discomfort. Therefore, a series of research trials were conducted at Louisiana State University, in which horses were fed meals with and without Purina® Outlast™ Gastric Supplement to test the hypothesis that this proprietary mineral complex would support optimal stomach acid more than a control feed. Successfully buffering stomach acid for horses could be an important factor in managing horses' gastric comfort.

#### < MATERIALS AND METHODS >

In trial 1, twenty mature, healthy TB geldings were housed in stalls and on testing day were fasted for 16 hours prior to gastric endoscopy. Gastroscopy was performed using a 3-meter endoscope for collection of gastric juice for pH measurement. After collection, horses immediately received either 0.5 lb/500 kg BW of a control pellet or 0.5 lb/500 kg BW of a treatment pellet containing Outlast™ gastric supplement. Two hours later, horses received a second endoscopy for collection of gastric juice and pH measurement. In a second trial, nine TB geldings were housed in stalls and on testing days 0, 7 and 14, the horses received 1 of 3 dietary treatments (CON, Outlast1x, Outlast2x) in a randomized, crossover design at a rate of 45.4 g/100 kg BW along with 0.55 kg Purina® Omolene 100® horse feed. CON contained no added minerals, Outlast1x contained minerals at a lower concentration, and Outlast2x contained minerals at 2x the concentration of Outlast1x. The final on-market formulation of Outlast™ gastric supplement is formulated at the 2x concentration. All horses underwent gastroscopy prior to feeding the treatments, and at 2 and 4 hours post-feeding. For both trials, gastric juice (60 ml) was aspirated from the biopsy channel and pH measured in duplicate using a benchtop pH meter. Analysis of variance was done with mixed models using GLIMMIX procedure in SAS, and least squares means were compared using Fisher's least significant difference ( $P < 0.05$ ).

<sup>1</sup>Gordon, ME, Vineyard, KR, Andrews, F. HR 198. 2015. LSU gastric pH study

<sup>2</sup>Gordon, ME, Vineyard, KR, Andrews, F. HR 212. 2016. LSU titration study (Published in abstract form in the 2017 Equine Science Society Proceedings as: *The effect of a natural-source mineral supplement on gastric juice pH in horses.*)

## < RESULTS >

For trial 1, at 2 hours post-feeding, gastric pH was higher in the treatment group receiving Outlast™ supplement than the control group (Figure 1). For trial 2, there was a significant time effect ( $P < 0.0001$ ) with an increase in gastric juice pH from time 0 ( $2.31 \pm 0.48$ ) to 2 hours ( $5.52 \pm 0.48$ ) and 4 hours ( $3.59 \pm 0.48$ ). Gastric juice pH at 2 hours was higher ( $P = 0.0122$ ) in Outlast1x ( $5.78 \pm 0.58$ ) and Outlast2x ( $5.92 \pm 0.57$ ) than CON ( $4.88 \pm 0.58$ , Figure 2).

## < IMPLICATIONS >

In conclusion, providing horses at risk for gastric ulcers a feed or supplement containing Purina Outlast™ Gastric Supplement may help to achieve optimal gastric pH. The increase in pH lasted for at least two hours under these described feeding and management conditions. For horses at risk for gastric ulcers or gastric discomfort, Purina Outlast™ Gastric Supplement may help support proper gastric pH.

FIGURE 1

Gastric pH 2 hours after a meal for control and Outlast™ supplemented horses. Differing letters denote treatment effect at ( $P < 0.05$ ).

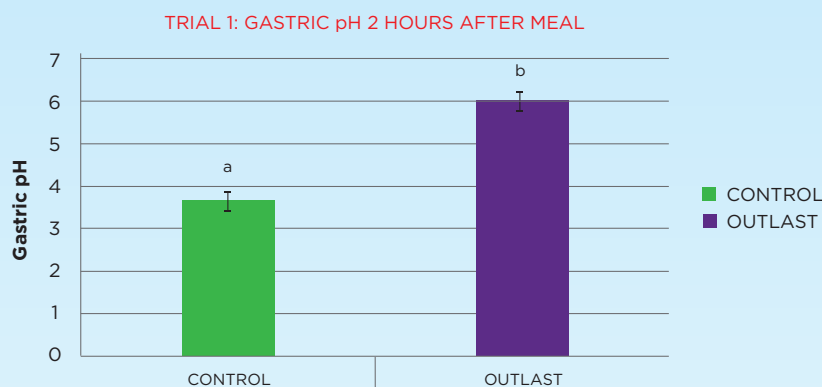
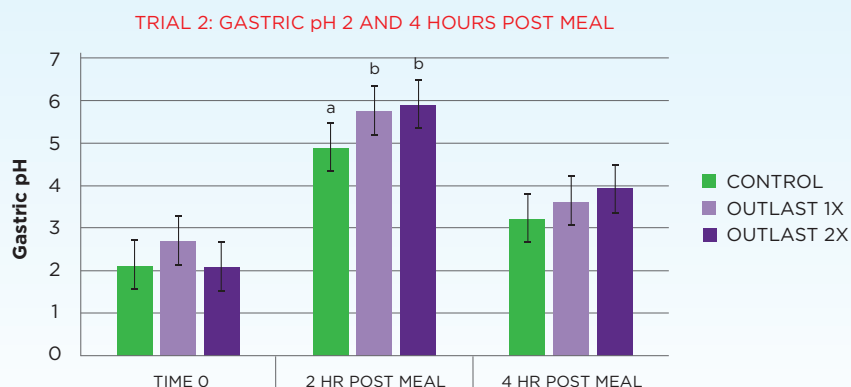


FIGURE 2

Gastric pH at time 0 (pre-feeding) and 2 and 4 hours post-feeding for control and Outlast™ supplemented horses. Differing letters denote treatment effect at 2 hours ( $P < 0.05$ ).



< AVAILABLE UPON REQUEST > Contact your local Purina representative if you would like more information about this study.