# Research Now

## Feeding Zinpro Performance Minerals® (ZPM) to Horses is Beneficial in Managing Gastric Ulcers

**Introduction:**

Non-glandular gastric ulcers have been identified in several classifications of horses. The objective of this study was to determine if feeding ZPM affected the healing and/or prevention of gastric ulcers.

**Experiment Design:**

- 36 Thoroughbred horses
  - Horses were stall-confined in ambient environmental conditions
- Two 56 d periods, non-cross over design, mineral treatments applied daily
- 1 to 14 d: Horses treated with omeprazole paste (GastroGard®) in order to heal ulcers present at initiation of the study
- 42 to 49 d: Subjected all horses to alternate feed-deprivation protocol
- Gastroscopy performed on d 0, 14, 42, 49 and 56 to determine ulcer scores

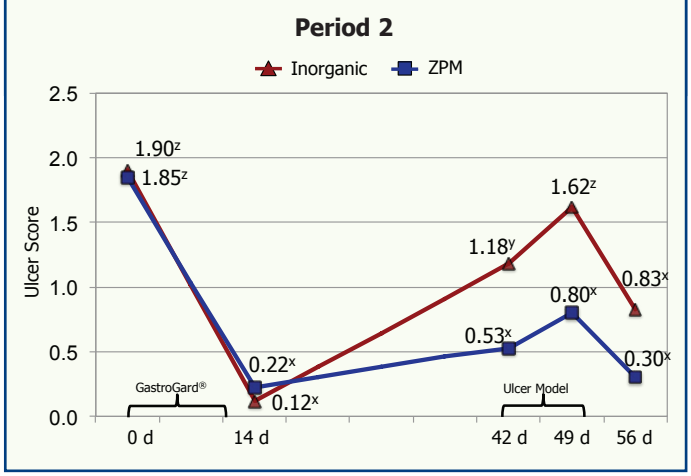
**Treatments:**

- Inorganic: Zinc Sulfate (40 ppm Zn); manganese sulfate (40 ppm Mn); copper sulfate (10 ppm Cu) and cobalt carbonate (5 ppm Co)
- ZPM: Iso-levels to Inorganic; ZINPRO® zinc methionine, MANPRO® manganese methionine, CuPLEX® copper lysine and COPRO® cobalt glucoheptonate

**Results:**

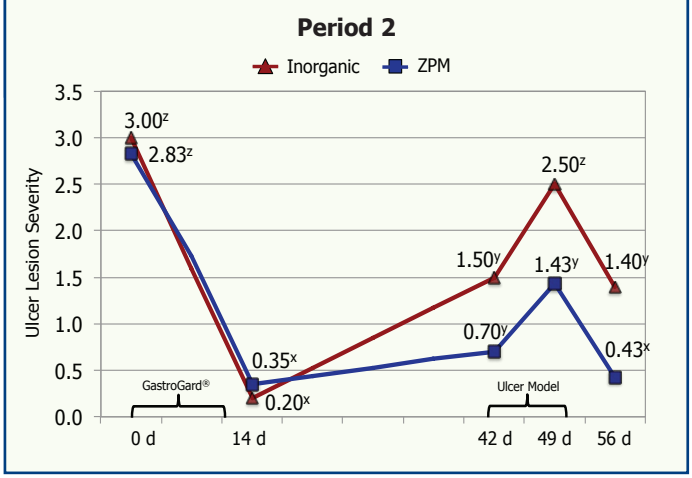
- Gastric ulcer severity scores on d 14 were improved in all horses with the omeprazole paste treatment as expected. The alternate feed-deprivation protocol increased scores by d 49. By d 56, severity scores were lower following the recovery period.
- A treatment effect was noted in Period 2 with horses fed ZPM showing lower severity scores during periods of the deprivation challenge and recovery. Higher temperatures and humidity during Period 2 may have contributed to the difference expressed between the two treatments.

### Non-Glandular Equine Gastric Ulcer Scores




xyz Experiment X Trt X Day, $P < 0.05$; LSMeans lacking common superscript letters differ, $P < 0.05$

### Non-Glandular Equine Gastric Ulcer Lesion Severity




xyz Experiment X Trt X Day, $P < 0.05$; Bars lacking common superscript letters differ, $P < 0.05$

# Abstract

**Evaluating replacement of supplemental inorganic minerals with Zinpro Performance Minerals on prevention of gastric ulcers in horses.** P. Loftin[1], M. Woodward[1], W. Bidot, J. Cartmill[1], S. Zoccarato, F. Garza, Jr.[1], M. Keowen[1], C. Larson[2] and F. M. Andrews[1]. 1. Louisiana State University, Baton Rouge, LA, 2. Zinpro Corporation, Eden Prairie, MN.

Non-glandular (NG) gastric ulcers are common in the horse. Zinc is an essential co-enzyme involved in healing of mucosal surfaces and has been used to treat and prevent gastric ulcers in other species. The purpose of this study was to test the efficacy of a feed supplement containing zinc methionine and other organic minerals (ZPM) to a supplement containing inorganic zinc, as zinc sulfate (ZS), for prevention of gastric ulcers in horses.

The study was a blinded 2-period non-crossover using adult Thoroughbred horses (n=36). ZPM (400 mg) or ZS (400 mg) milled into pellets was mixed with crimped oats and fed to the horses twice daily for 56 d. Horses were stratified by NG ulcer score, then by sex and assigned to two treatment groups (n=18). There were two 56 d periods, where horses were stall-confined in ambient environmental conditions. Horses received omeprazole paste (GastroGard®, 4 mg/kg, PO, Q24h) from d 1 to 14, were subjected to alternating feed-deprivation from d 42 to 49 and allowed to recover for 7 d. Gastroscopy was performed on d 0, 14, 42, 49 and 56. Gastric juice pH was measured and gastric ulcer number and severity scores were assigned by a mask clinician (FMA). Weather data were collected for the two periods. Gastric ulcer scores were expressed as mean (SD) and an ANOVA for repeated measures was used to compare ulcer scores between groups and over time. A post-hoc Tukey's test was used to determine differences ($P < 0.05$).

Horses (n=34) were treated for all 56 d. There was no treatment effect in the study; however, there was a period effect. Mean NG number and severity scores were significantly lower in the ZPM-treated horses, compared to ZS-treated horses, on d 42, 49 and 56, during period 2. Overall, for both periods, mean NG gastric ulcer scores significantly decreased in both treatment groups by d 14, after omeprazole treatment, compared to d -1, 42, 49 and 56. Mean NG gastric ulcer scores significantly increased on d 42, compared to d 14, but were still lower than on d -1. Mean NG gastric ulcer scores increased significantly by d 49, due to alternating feed-deprivation, then decreased to below pretreatment values by d 56. No significant differences were seen in glandular ulcer scores between groups. Means environmental temperature (68ºF vs. 84ºF), heat index (82 vs. 90) and relative humidity (74% vs. 79%) were higher during Period 2 of the study and may have contributed to the effectiveness of the ZPM.

ZPM treatment resulted in lower gastric ulcer scores in horses participating in Period 2 of this study, but when data were pooled there was no treatment effect. ZPM at levels fed in this study may be beneficial in preventing gastric ulcers after omeprazole treatment in horses housed in stalls and fed intermittently, especially in hot and humid environmental conditions.

**Key words:** Equine, Gastric Ulcers, Zinc, Manganese, Copper

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