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RESEARCH  
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## Purina® Systemiq™ Probiotic Supplement Helps Support Optimal Gastrointestinal Health as Measured through Fecal Consistency

A SUMMARY OF RESEARCH CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER EVALUATING THE EFFECTS OF FEEDING SYSTEMIQ™ PROBIOTIC SUPPLEMENT TO HORSES UNDERGOING A GASTROINTESTINAL STRESS CHALLENGE.<sup>1</sup>

< BACKGROUND >

Optimal gastrointestinal health in horses is a function of a variety of factors including management, nutrition, and veterinary care. Horse owners are often aware of changes in their horse's overall behavior, demeanor, and performance, and utilize these observations as markers of overall health. A commonly observed, though sometimes misunderstood indicator of health, is the consistency of the feces produced by their horse. While fecal consistency may differ between horses, it typically remains consistent within an individual horse unless there is a major diet change or health event. Purina® Systemiq™ Probiotic Supplement is formulated with a unique live and active strain of *Bacillus coagulans* (GBI-30, 6086) that supports overall gut health, modulates inflammation, and imparts a beneficial systemic effect on the health of the horse. The objective of this trial was to observe the changes in fecal consistency in horses undergoing a forced gastrointestinal stress challenge. It was hypothesized that horses consuming Purina® Systemiq™ would have improved fecal consistency compared to those in the negative control group.

< MATERIALS AND METHODS >

A group of nineteen (n = 19; average age = 6.3 years; average BCS = 6.25) horses of mixed breed (Quarter Horse = 12; Thoroughbred = 7) and gender (gelding = 11; mare = 8) were split into two groups (Treatment = 10; Control = 9) so that each group contained similar numbers of horses of different breeds, ages, and genders. Before the trial, all horses were maintained on the same concentrate (Purina® Strategy GX®; CP = 14.7%, Fat = 7.2%, ADF = 14.2%, NDF = 31.5%) and grass hay (CP = 9.5%, Fat = 2.9%, ADF = 39.0%, NDF = 61.7%) fed to maintain a BCS of at least 5/9. On day 0 of the trial, all horses were housed in stalls overnight and fasted for 12 hours to allow for gastric endoscopy on the following day.

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<sup>1</sup>HR 374. The effects of feeding a specific probiotic strain to horses undergoing a gastric ulcer induction challenge. Jacobs, R.D. et al. 2023. Internal research, PANC.

<sup>2</sup>Sykes BW, Hewetson M, Hepburn RJ, Luthersson N, Tamzali Y. European College of Equine Internal Medicine Consensus Statement-Equine Gastric Ulcer Syndrome in Adult Horses. *J Vet Intern Med.* 2015;29:1288-99.

At the onset of the trial, all horses underwent a gastric endoscopy to visualize their stomachs. A scoring system was used by a veterinarian blinded to treatment to assess the health of each horse's gastric environment.<sup>2</sup> This score considered the number and severity of ulcers in both the glandular and non-glandular regions of the stomach as well as the presence and severity of ulcers on the pylorus. Severity of ulcers was scored on a scale of 0-5 and an overall Equine Gastric Ulcer Score was scored on a scale of 0-4 with a score of 0 indicating no ulceration and a score of 4 indicative of extensive lesions with areas of deep ulceration.

Following the endoscopy, all horses were enrolled into an IACUC approved gastric ulcer induction (GUI) protocol. During the GUI phase of the trial, horses were housed in individual stalls (12' x 12') for 24 hours daily with free-choice access to clean water and a plain white salt block. The GUI phase of the trial lasted for 17 days during which horses were exercised for 46 min for 5 days/week (M-F) in an equine exerciser. During this phase, horses received no long-stem forage and dietary needs were met by a complete feed (CP = 12.2%, Fat = 6.3%, ADF = 23/6%, NDF = 38.9%) offered at 2.0% BW split into three meals (AM = Approx. 15 min post exercise, Lunch = 1500, and PM = 2000). Horses in the treatment group received one quarter of the daily recommended feeding of Purina® Systemiq™ Probiotic Supplement at four feedings (PreEx, AM, Lunch, and PM). The total amount of probiotic was split into four equal feedings for research consistency. Stalls were cleaned and bedded twice daily to remove manure, urine, and dirty shavings.

On day 18 all horses underwent a second gastric endoscopy, during which the same veterinarian assessed gastric health. Following the second endoscopy, horses entered into the recovery (REC) phase of the trial. During this phase, the horses were transitioned to a diet of Purina® Strategy GX® (2.72 kg) and grass hay (1.5% BW) split into two meals daily. Horses in the treatment group were offered one half of the daily recommended feeding rate of Purina® Systemiq™ Probiotic with their concentrate at AM (0700) and PM (1500) feedings. During the REC phase, horses were allowed access to drylots by treatment group from approximately 0800 to 1300 daily.

Horses remained in the REC phase for 56 days and on day 57 all horses underwent a final gastric endoscopy to assess gastric health. On each day of the trial, horses were assigned a fecal score to characterize their individual fecal quality and consistency. A 9-point ranking system<sup>3</sup> was used with a score of 1 being described as “pure liquid” and a score of 9 described as “dry with mucous.” An optimal score is considered between 6-7 and described as “normal” or “soft formed.” Horses were evaluated and observed constantly through the course of the trial for any signs or symptoms requiring veterinary care. Fecal scores and gastric ulcer data were collected, and analyzed via SAS 9.4 (Cary, NC) utilizing a MIXED procedure ANOVA.

## < RESULTS >

The objective of this trial was to evaluate the effects of a live and active probiotic strain on fecal consistency following a gastrointestinal stress challenge. While all horses experienced increased gastric ulcer scores and a reduction in fecal consistency over the course of the experimental period, no horses required veterinary care or displayed significant pain. All horses, regardless of treatment group had an increase in the number and severity of gastric ulcers (**Figures 1 and 2**) as well as an increase in EGUS (Equine Gastric Ulcer Syndrome) score (**Figure 3**) at the second endoscopy timepoint as compared to the initial endoscopy. Additionally, these same markers of gastric health returned to baseline following the 57-day recovery period.

One of the gastrointestinal health markers utilized in this trial was fecal consistency scoring. A decrease in fecal consistency is commonly associated with gastrointestinal inflammation and/or impaired hindgut function. In this trial, all horses experienced a decrease in fecal consistency at the onset and over the course of the GUI phase. However, horses receiving daily supplementation with Purina® Systemiq™ Probiotic Supplement experienced a significantly less pronounced decrease in fecal consistency (**Figure 4**). Data are displayed only until day 33. All scores between treatment groups were identical after this timepoint.

## < CONCLUSIONS AND IMPLICATIONS >

Gastrointestinal health is of great importance to horse owners and veterinarians. Compromised gastrointestinal function can lead to decreases in overall performance and systemic health. Purina® Systemiq™ Probiotic Supplement contains a unique *Bacillus coagulans* (GBI-30, 6086) strain of bacteria that remains live and active through the manufacturing process and as it passes through the gastrointestinal tract of the horse. It functions to promote an optimal gut microflora, modulate inflammation, and improve enterocyte health and function.<sup>4</sup> The data gathered in this trial demonstrate that horses consuming Purina® Systemiq™ Probiotic Supplement are better prepared to manage a stressful or otherwise gastrointestinal compromising event that may negatively affect horse health and performance.

<sup>3</sup>Association of Zoos and Aquariums. Fecal score chart for equids.

<sup>4</sup>HR367. The effects of feeding probiotics on exercise-induced inflammation. Jacobs, R.D. et al., 2023. Internal research, PANAC.

FIGURE 1 Number of non-glandular ulcers in all horses. (P < 0.05)

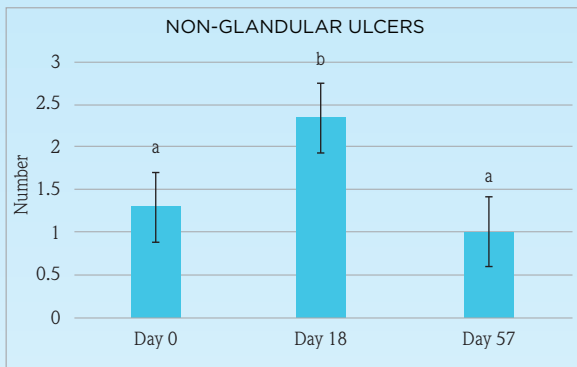


FIGURE 2 Number of glandular ulcers in all horses. (P < 0.05)

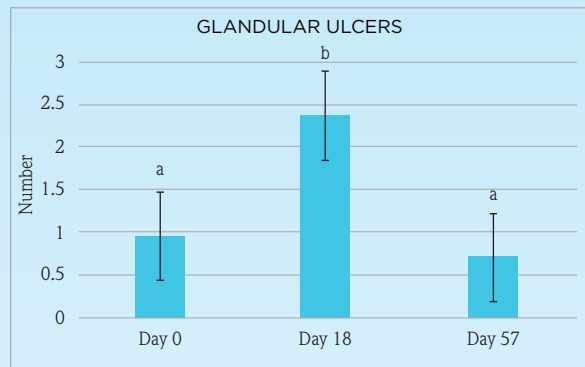


FIGURE 3 Equine Gastric Ulcer Syndrome (EGUS) Score in all horses. (P<0.05)

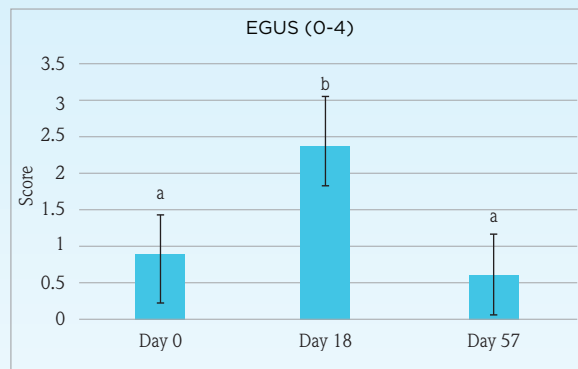
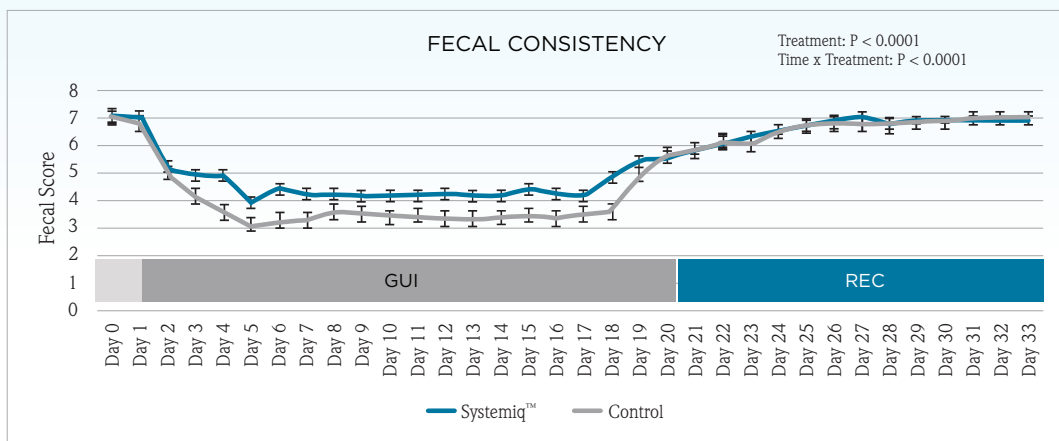


FIGURE 4 Fecal scores in horses.



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