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RESEARCH

Purina® Systemiq™ Probiotic Supplement Promotes Optimal Exercise Recovery in Horses

A SUMMARY OF RESEARCH CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER EVALUATING THE EFFECTS OF FEEDING SYSTEMIQ™ PROBIOTIC SUPPLEMENT TO HORSES UNDERGOING AN EXERCISE CHALLENGE.^{1, 2}

< BACKGROUND >

Horses in training, performing, or otherwise working are subject to varying levels of stress. This stress often manifests as increased inflammation coupled with a reduction in overall athletic performance and delayed recovery. The microbiome of the horse is intricately coupled to the immune system and the inflammatory pathways associated with exercise response. Previous *in vitro* research identified a series of *Bacillus* probiotics with potent anti-inflammatory properties.³ To that end, the objective of this trial was to evaluate these unique *Bacilli* in horses using an exercise-induced model of inflammation. It was hypothesized that one or more of the probiotics would reduce inflammation, supporting an optimal response to exercise.

< MATERIALS AND METHODS >

Eighteen horses were utilized in a randomized cross-over trial. Horses were randomly assigned to one of five starting treatments including a negative control, and groups that received one of four probiotics (*Bacillus coagulans* (GBI-30, 6086): active ingredient in Purina® Systemiq™, *Bacillus subtilis* (1), *Bacillus subtilis* (2), or *Bacillus amyloliquefaciens*) top-dressed to their daily ration at a rate of 8 billion CFU/day mixed into dried whey powder. All horses received a similar base diet of grass hay (CP = 9.5%, Fat = 2.9%, ADF = 39.0%, NDF = 61.7%) offered at 2.0% of bodyweight daily along with 4.54 kg of Purina® Omolene 500® horse feed (CP = 12.6%, Fat = 8.6%, ADF = 13.4%, NDF = 29.5%). Each 3-week phase of the trial consisted of a 2-week dietary acclimation followed by a 1-week exercise challenge and sample collection. Between phases, horses were offered only their base diet. On the day of exercise, horses were offered their AM ration and then subjected to a 2-hour standardized exercise test on an equine exerciser. Blood samples were obtained prior to starting exercise and then again at 0, 2, 4, 6, 8, 24, 48, and 72 hours post exercise. Blood samples were analyzed for serum amyloid A (SAA), interleukin-6 (IL-6), and prostaglandin E₂ (PGE₂), and data were analyzed via SAS 9.4 (Cary, NC) utilizing a MIXED procedure ANOVA.

¹HR367. The effects of feeding probiotics on exercise-induced inflammation. Jacobs, R.D. et al., 2023. Internal research, PANC.

²Oral probiotic administration attenuates post-exercise inflammation in horses. Jacobs R.D. et al. Translational Animal Science. In preparation.

³Evaluation of *Bacillus* for anti-inflammatory, anti-oxidant, and other properties. Ayala, D. et al., 2023. Internal Research, PANC.

< RESULTS >

The objective of this trial was to evaluate the effects of a selection of *Bacillus* probiotics on the inflammatory response to exercise in horses. Horses consuming *Bacillus coagulans* (GBI-30, 6086) had reduced production of SAA, IL-6, and PGE₂ compared to all other probiotic-fed groups and the negative control (Figures 1-3; $P < 0.001$).

< CONCLUSIONS AND IMPLICATIONS >

Supporting the needs of equine athletes during the post-exercise recovery period allows for a more appropriate response to exercise, and an overall increased athletic performance. The data collected in this trial support the incorporation of *Bacillus coagulans* (GBI-30, 6086) into Purina® Systemiq™ Probiotic Supplement. The reduced inflammation observed post exercise in horses supplemented with this unique probiotic represents a novel utilization of probiotics for horses.

FIGURE 1 Serum amyloid A levels in horses following an exercise challenge.
Treatment: $P < 0.0001$
Time x Treatment: $P < 0.0001$

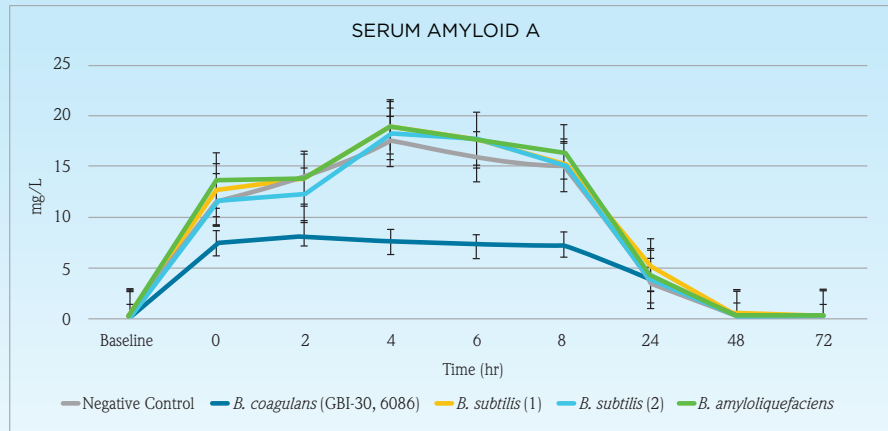


FIGURE 2 Interleukin-6 levels in horses following an exercise challenge.
Treatment: $P < 0.0001$
Time x Treatment: $P < 0.0001$

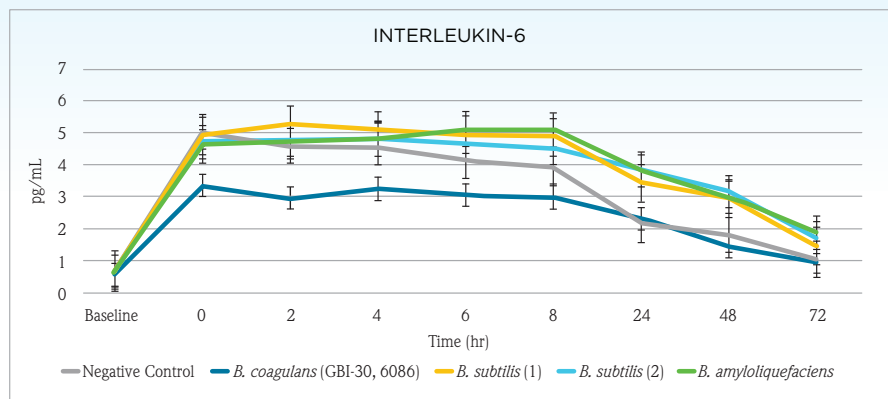
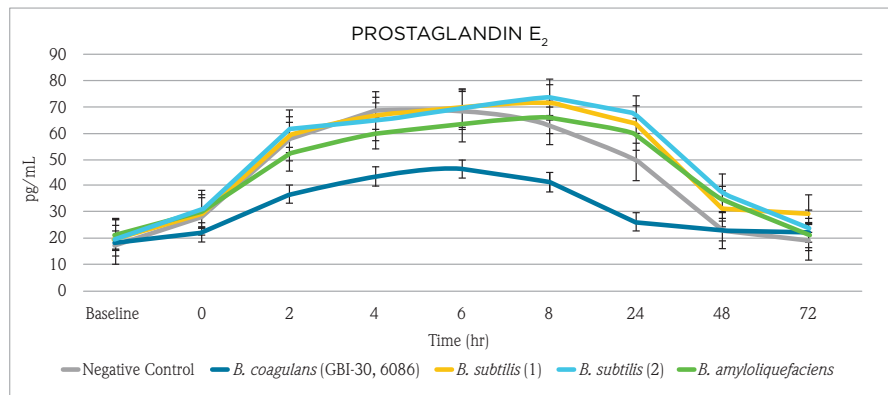


FIGURE 3 Prostaglandin E₂ levels in horses following an exercise challenge.
Treatment: $P < 0.0001$
Time x Treatment: $P < 0.0001$



< FOR MORE INFORMATION > Contact your local Purina representative if you would like more information about this study or product.