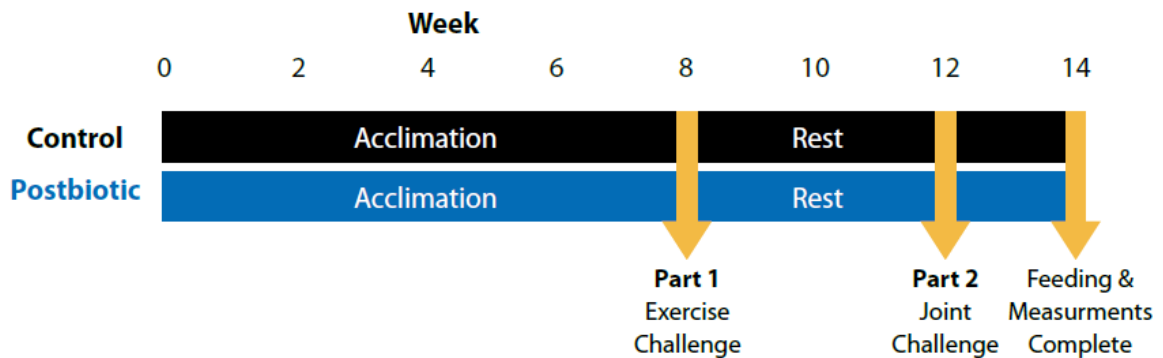


Effects of Postbiotic in Young Horses: Part 2 – LPS Joint Challenge

This study is part two of a two-part study with the same set of horses.

Figure 1: Timeline of experimental conditions



- 19 yearling Quarter Horses (9 ± 1 months; 266 ± 32 kg; 11 fillies, 8 colts) were included in this study. One colt was removed from Part 1 of the study (Exercise Challenge), but recovered and was included in Part 2.
- Yearlings were balanced by age, sex, body weight (BW), and farm of origin and randomly assigned to 1 of 2 treatment groups:
 - Control – pelleted grain with no supplementation (CON; n=9)
 - Treatment – pelleted grain plus *Saccharomyces cerevisiae* fermentation product
 - 21 g/hd/d [(10.5 g/feeding (n=10))³
- Horses were individually fed a basal diet (1.25% BW/d; DM basis) of custom-formulated pelleted grain + Coastal bermudagrass hay (fed ad libitum).
- Horses received diets for 14 weeks.
- At 12 weeks, one radiocarpal joint from each horse was randomly selected to receive an injection of 0.5 ng lipopolysaccharide solution (LPS) obtained from E.

coli 055:B5; the remaining carpal joint from each horse was simultaneously injected with sterile lactated Ringer's solution (LRS) and served as a contralateral control.

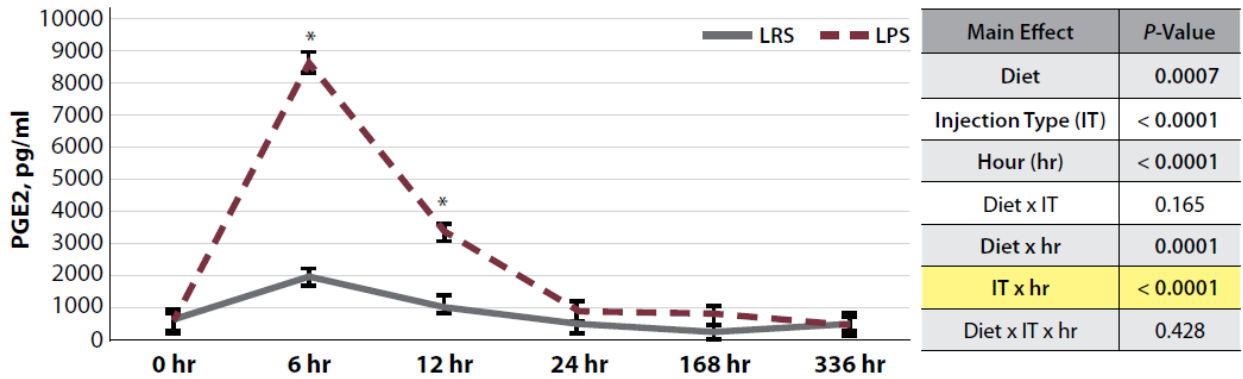
- Synovial fluid was obtained at hour 0 (pre-injection) and 6, 12, 24, 168, and 336 hours post-injection. Samples were tested for
 - Prostaglandin E2 (PGE2; inflammatory biomarker), carboxypeptide of type II collagen (CPII; cartilage synthesis), and collagenase cleavage neopeptide (C2C ; cartilage degradation) by commercial ELISA.

Results

- Intra-articular injection of both LRS and LPS induced mild and moderate inflammatory responses, respectively, as measured by PGE2 in the synovial fluid.
- Overall, synovial PGE2 was lower in horses fed the diet with the Postbiotic versus horses fed the control diet.
- Regardless of injection type, horses fed the Postbiotic demonstrated significantly ($P=0.01$) lower PGE2 at 6 hours post-injection than horses fed the control diet.

Horses fed the diet with Postbiotic responded more rapidly and demonstrated a higher overall CPII (cartilage synthesis):C2C (cartilage degradation) ratio versus control horses. This suggests that they were able to balance the acute inflammatory insult to the joint with consistent, insult-appropriate levels of cartilage breakdown and synthesis until the response was no longer needed and these functions returned to baseline. In contrast, the responses of control horses appeared to be more erratic and less efficient.

Figure 2: Effects of Time on Synovial Fluid PGE2 Concentrations After Intra-Articular Injection of Lipopolysaccharide (LPS) or Lactated Ringer's Solution (LRS)



*Within time, LPS differs from LRS ($P < 0.05$)

Figure 3: Effects of Postbiotic on Synovial Fluid PGE2 Concentrations After Intra-Articular Injection of Lipopolysaccharide (LPS) or Lactated Ringer's Solution (LRS)

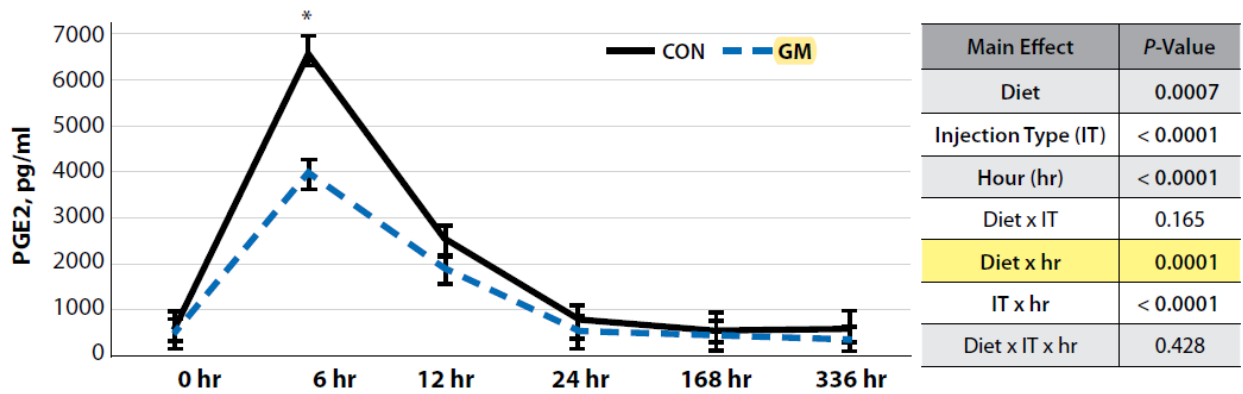
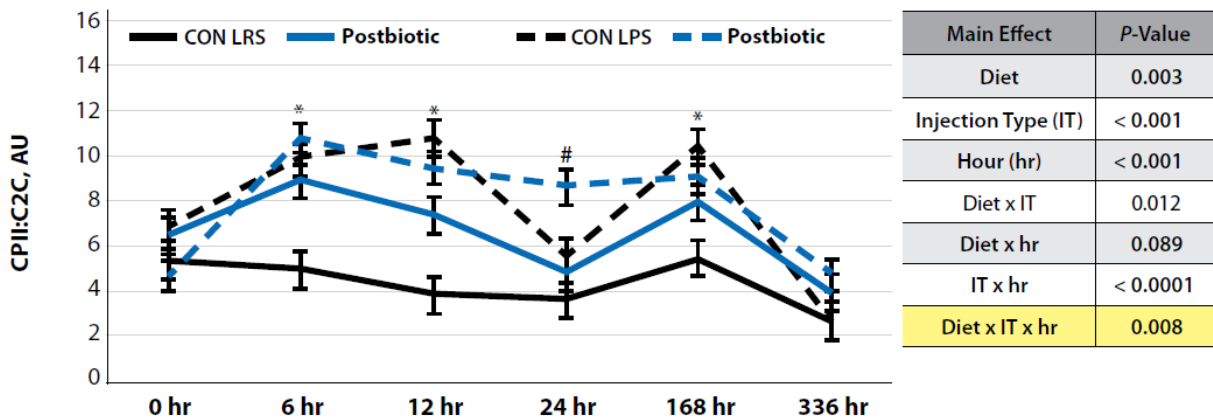


Figure 4: Effects of Postbiotic on Synovial Fluid CPII:C2C Ratio After Intra-Articular Injection of Lipopolysaccharide (LPS) or Lactated Ringer's Solution (LRS)



* Within time, CON LRS differs from all other treatments ($P < 0.05$)

Within time, the Postbiotic differs from all other treatments ($P < 0.05$)

