Impacts of DigestaWell® NRG supplementation on post exercise muscle soreness

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Exercise induced muscle soreness (MS) and fatigue reduces the usability of horses, and may be due to lactic acid accumulation and increased inflammation. Fenugreek and *yucca schidigera* may increase exercise recovery and reduce inflammatory responses in humans. Recently, horses consuming a dietary supplement of *yucca schidigera* and fenugreek, DigestaWell NRG (NRG), for 7d had less lactic acid accumulation post exercise. The objective of this study was to evaluate post exercise MS and pro-inflammatory cytokines in horses consuming NRG for 4wk. Twenty horses were assigned to either treatment (TRT; n=10) receiving NRG (100g/d) for 4 wk or unsupplemented controls (CON). All horses participated in a standard exercise test (SET) prior to the study (period 1) and again after 4wk (period 2). The SET consisted of 50min of exercise under saddle: 2.5min walk, 15min trot, 5min canter, and 2.5min walk, both directions while carrying 20% BWT. MS was evaluated 24hr before and after each SET by a blinded massage therapist on 20 sites per side using a subjective scoring system: 0 (no pain) to 2.5 (severe pain elicited), and the percent change from pre-SET was calculated for each SET. Blood was collected and plasma analyzed for lactate, interleukin 1b (IL1), and tumor necrosis factor-α (TNF) pre-SET, 10 and 30min, and 2, 6, and 24hr after the SET. Statistical analysis was performed in SAS using MIXED ANOVA with fixed effects of hr and treatment with repeated measures on hr within horse. Lactate and TNF were log transformed and reported as geometric mean with a 95% CI. The percent increase in MS following exercise was not different for CON horses when comparing periods (P=0.9), whereas TRT horses had a lower percent increase in MS in period 2 (P=0.013). During period 1, TRT and CON horses had similar post exercise lactate (P>0.9), and IL1 (P>0.2). NRG reduced post exercise lactate (0.71[0.67-0.75] vs 0.60[0.57-0.63]mmol/L; P=0.029) in TRT horses, when compared to CON. During period 2, IL1 was elevated post exercise at 30min, 2 and 6hr (P<0.05) and tended to be higher at 24hr post exercise (P=0.059), but was not different between TRT and CON horses (P>0.5). Period 1 TNF for TRT and CON horses tended to differ (P=0.055), and therefore, period 2 was compared to period 1 within TRT horses to test the effect of NRG. There was no response of TNF to exercise (P>0.5), but period 1 was greater than period 2 (P=0.012; 184[179-189]) vs 173[168-178]pg/mL). These varying effects on post-exercise systemic inflammation should be explored further. The reduction in post-exercise lactic acid accumulation and TNF by NRG may explain the decrease in muscle soreness following supplementation.

Key words: muscle soreness, exercise