

55 Impacts of dietary Protandim Nrf2 Synergizer on antioxidant status of mature, sedentary horses

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Reactive oxygen species are normal by-products of cellular metabolism but may have detrimental effects on cellular matrices when overproduced. Dietary antioxidants may neutralize excess free radicals and prevent the imbalance of oxidants to antioxidants, referred to as oxidative stress. To test the hypothesis that supplementation of an herbal extract combination (Protandim Nrf2 Synergizer, LifeVantage Corporation) would improve the body's enzymatic defense system, 40 mature, sedentary horses (32 mares, 8 geldings, mean \pm SD; 15.7 \pm 4.9 y, 519 \pm 46 kg) were stratified by age, sex, and body weight (BW) and randomly assigned to one of 4 dietary treatment groups for 56 d: 1) 0 mg (CON); 2) 675 mg (Pro1); 3) 2,025 mg (Pro3); or 4) 4,050 mg (Pro6) Protandim Nrf2 Synergizer per day (n = 10 per group). Horses were group housed and received a basal diet of coastal bermudagrass hay ad libitum and a custom-formulated concentrate grain fed individually at 0.5% BW/d (dry matter basis) split evenly between 2 meals per d. The supplement was top-dressed on the morning grain meal. Blood samples were collected at d 0, 28, and 56 of supplementation before the morning feeding and analyzed for hydrogen peroxide (H₂O₂) production and concentration, superoxide dismutase (SOD) and glutathione peroxidase (GPx) activities, and malondialdehyde (MDA) concentration. Data were analyzed using linear models in SAS v9.4; sex, treatment, time, time \times treatment were fixed effects and time was a repeated effect with horse(treatment) as the subject. Day 0 was included in all models as a covariate. No measure was impacted by dietary treatment. Regardless of treatment, whole blood SOD activity, plasma MDA, and serum H₂O₂ concentration decreased from d 0 to 28 ($P \leq 0.0001$) and remained suppressed at d 56 ($P \leq 0.0007$). Conversely, whole blood GPx activity increased from d 0 to 28 ($P = 0.01$) and decreased from d 28 to 56 ($P = 0.02$) to be similar to d 0 at d 56. Serum H₂O₂ production was greater in geldings than mares ($P = 0.04$) but no other variable was impacted by sex. Dietary supplementation of up to 4,050 mg/d Protandim Nrf2 Synergizer did not impact antioxidant status in mature, sedentary horses. **Effects of supplementation on antioxidant status should be investigated in horses subjected to elevated oxidative insult, such as exercise.**

