

IMPACT OF DIETARY PHYTATE SUPPLEMENTATION ON IRON AND PHOSPHORUS UTILIZATION IN HORSES (*EQUUS CABALLUS*)

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Abstract

The form of phytic acid also known as inositol hexaphosphate (IP6) has been extensively demonstrated to serve as a powerful iron chelator, anti-oxidant, anti-inflammatory, and a potential source of additional dietary phosphorus (Grafs *et al.*, 1987; Grases *et al.*, 2001; Schlemmer *et al.*, 2009; Warren *et al.*, 2013; Zajdel *et al.*, 2013; Bhowmik *et al.*, 2017). In an effort to begin to elucidate the link between phosphorus, iron availability, and inflammation in black rhinoceros, horses were used as a digestive model in a feeding trial utilizing a flavorless and safe powder form of IP6. We hypothesize that diet supplementation with IP6 would be safe in this large hindgut fermenting herbivore at a dose of 50 mg/kg DM. A crossover design was used with seven gelding Quarter horses receiving either IP6 or control equivalent quantity of minerals (composed of calcium carbonate, sodium phosphate, and magnesium glycinate) for two weeks at a time, with a washout period of one week. Blood collection occurred before and after each treatment period, and a digestibility collection was performed using collection harnesses during the last 3 days of each period. All horses maintained their health throughout the study, as assessed from a husbandry perspective and through measured serum and digestibility parameters. While horses do not commonly have iron overload issues, changes in potential bioavailability of dietary minerals with the addition of IP6, especially iron, have encouraging possibilities for application with black rhinoceroses.

Literature Cited

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