Assessment of Complete Blood Count and Biochemistry Parameters in Adult Dogs fed a Grain-Free Diet with up to Forty-Five Percent Pulse Inclusion.

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Abstract: With interest in grain-free diets (GFD) and plant-based diets, understanding the use of pulse ingredients is warranted. Recently our laboratory found that high pulse inclusive diets did not cause echocardiographic changes in healthy adult dogs after 20 weeks of feeding. Thus, the objective of this study was to assess the safety of pulse ingredient inclusion up to 45% in canine diets using gross physiological, hematological and biochemical measurements. Twenty-eight healthy adult Siberian huskies were fed one of four experimental diets formulated to achieve the same macronutrient targets and the same micronutrient supplementation for 20 weeks: 1) grain-inclusive diet, with 45% corn, 0% pulses (Control); 2) GFD, 15% pulses (Pulse15); 3) GFD, 30% pulses (Pulse30) 4) GFD, 45% pulses (Pulse45). All diets included chicken meal and the same combination of pulse ingredients; green and yellow peas, pinto beans, chickpeas, and lentils. Dogs were fed once daily. Body weight was measured weekly, feed intake measured daily, and body composition was measured using DEXA at baseline and week 20. Fasted blood samples were collected at weeks -3, 3, 6, 10, 14 and 18. Data were analyzed as repeated measures in SAS using PROC GLIMMIX. Body weight, body composition, and feed intake were similar among treatments and over time (P >0.05). Several blood parameters were different among treatments but remained within defined reference ranges for healthy dogs. Red blood cells, hemoglobin and corpuscular cal volume were greater, while lymphocytes were reduced in Pulse45 than Pulse15 (P< 0.05), but similar to Control and Pulse30. Mean corpuscular hemoglobin concentration was decreased in Control and Pulse15 compared with Pulse30 and Pulse45 (P< 0.05). Gamma-glutamyl transferase was less in Control and Pulse15 than Pulse45 (P< 0.05), but similar to Pulse30. These data suggest that feeding diets with up to 45% pulse inclusion for 20 weeks does not impact gross health parameters of healthy adult dogs.

Keywords: dog, pulse, safety


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Abstract: The gut bacterial population has been demonstrated to influence the physiologic and metabolic functions of the host by modulating energy expenditure and immune response, therefore contributing to the health of the host. However, there is little information regarding the effects of probiotics and postbiotics on canine nutrition. The objective of this study was to evaluate the longitudinal effects of daily supplementation of Bifidobacterium animalis subsp. lactis CECT 8145 and the same strain in a heat-killed presentation (postbiotic) on weight management, fecal fermentative end-product concentration, gut hormones, postprandial glycemic and insulimemetic response in overweight dogs. Thirty-six adult dogs were used in a completely randomized, double-blinded, placebo-controlled study, with 12 animals per treatment. Dogs were fed a commercial dry extruded complete and balanced diet twice daily to maintain body weight. Following a 60 d adaptation to the control diet, dogs were fed their respective treatment diets for 90 d. Treatments were provided by ADM Biopolis (Valencia, Spain) and given via gelatin capsules before morning feeding to ensure consumption of the total dose of their placebo, probiotic, or heat-killed probiotic. The treatments supplementation had no detrimental effect on the overall dog’s health. Throughout the experimental period, fecal scores did not differ among dogs fed different dietary treatments (P > 0.05). However, fecal pH was significantly lower (P = 0.0049) in the dogs fed the postbiotic (5.8) compared with the group control (6.1). Greater fecal concentration of propionate (P=0.0427) was observed on dogs fed the probiotic and the dogs fed the postbiotic compared with the group control. Pancreatic polypeptide plasma concentration was less (P < 0.05) in the dogs fed the probiotic compared with treatment control. These data suggest that the longitudinal supplementation of this specific strain in the live and heat-killed presentation may interact with gut microbial fermentation and gut hormonal regulation.

Keywords: canine, probiotics, postbiotics