

# Influence of dietary protein content and source on fecal quality, electrolyte concentrations, and osmolarity, and digestibility in dogs differing in body size

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### Abstract :

When fed the same diet, large-breed dogs tend to produce feces of poorer quality compared with small-breed dogs. Moreover, German shepherds, although having a BW similar to Giant Schnauzers, are particularly prone to digestive intolerance, producing feces of poor consistency and increased moisture. Digestive tolerance reflects the reaction of the animal to the diet, and it can be assessed by determining fecal quality (consistency, moisture, volume, odor, and color). This study was conducted to assess the effect of protein source and content on fecal quality, and to determine whether greater digestibility and lesser fecal osmolarity and electrolyte concentrations are associated with improved fecal quality in dogs differing in body size and digestive tolerance. Twenty-seven healthy female dogs were divided into 4 groups according to BW and digestive tolerance: small, medium, large tolerant, and large sensitive. Five diets, varying in protein source (wheat gluten, poultry meal, and a 50:50 mixture of both sources) and concentration (22, 29, and 39% CP on a DM basis for low, medium, and high, respectively) were tested. The present study was divided in 2 phases: 2 diets were studied in a crossover design in phase I, and 3 diets were studied in a Latin square design in phase II. Diets were fed for 14 d, followed by a 12-d transition period. Fecal score (1 = dry and hard feces, to 5 = liquid diarrhea), moisture, electrolytes (Na and K), and osmolarity, and digestibility of DM, energy, fat, CP, and ash were determined. Fecal score and moisture ( $P < 0.001$ ) were less and overall digestibility ( $P < 0.001$  for DM, CP, fat, ash, and energy) was greater for wheat gluten than for poultry meal diets. Large dogs had the greatest fecal score and moisture ( $P < 0.001$ ), together with the greatest overall digestibility ( $P < 0.001$  for DM,  $P = 0.054$  for CP,  $P = 0.005$  for ash, and  $P = 0.003$  for energy). Osmolarity was less for wheat gluten-based diets ( $P < 0.001$ ), and was not affected by dog size. Fecal electrolyte concentration varied mainly with dog group ( $P = 0.005$  for Na, and  $P < 0.001$  for K), being greater in large sensitive dogs compared with small dogs. Wheat gluten was proved to be a suitable protein source for modulating fecal quality in dogs, particularly in sensitive breeds. Poorer fecal quality in large sensitive dogs can be related to greater digestibility and greater fecal electrolyte concentrations, but not to fecal osmolarity.

### Key Word :

diarrhea, dog, fecal quality, feces, potassium, sodium

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