

UTILIZATION OF PORK AND PORK BY-PRODUCTS FOR NUTRITIONAL MANAGEMENT OF CAPTIVE EXOTIC FELIDS

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Abstract

Currently beef and horse comprise the majority of raw meat diet formulations marketed by US companies manufacturing and supplying carnivore diets to zoological institutions. Pork-based diets have traditionally not been fed to managed exotic carnivores, primarily because of microbial and pathogenic concerns, and nutrient digestibility of pork has not been evaluated in captive exotic felids. Additionally, the pork industry currently sends many by-products to rendering that have potential use in raw carnivore diets. The overall objectives of this research were to evaluate a raw, pork-based diet for small and large captive exotic felids, including diet compositional analyses, digestibility, fecal scores, palatability, and microbial loads.

In our first aim, we demonstrated that a raw pork-based diet was highly digestible in large exotic felids by using four raw meat dietary treatments: one horse-based (Horse), two beef-based (B1, B2), and one pork-based diet (Pork). DM and CP apparent digestibilities were higher ($P < 0.05$) in cats fed Pork (87.97 and 95.74%) compared with cats fed Horse (83.59 and 92.71%) and B2 (85.60 and 93.14%). Apparent OM digestibility was higher ($P < 0.05$) in cats fed Pork (90.76%) than cats fed Horse (88.53%). Apparent fat digestibility values were high across all treatments but were higher ($P < 0.05$) in cats fed Pork (98.51%) compared with cats fed B1 (95.51%) or B2 (96.45%). Gross energy (GE) digestibility values were higher in cats fed Pork (92.38%) compared with B1 (90.21%). Average fecal scores were 2.30, 2.94, 3.42, and 3.54 (on a scale of 1 to 5) for Horse, Pork, B1 and B2, respectively; and were different between every treatment with the exception of B1 and B2 which were not statistically different. The pork-based diet was palatable and was selected by captive large exotic felids in 24 of 37 total (64.86%) observations of first approached and 23 out of 33 total (69.70%) observations for first tasted, compared to a raw beef-based diet.

In our second aim, we showed that a raw pork-based diet was highly digestible in small exotic felids by using raw horse (Horse), beef (Beef), beef/horse blend (Blend), and pork-based (Pork) dietary treatments. All diets were highly digestible, especially fat digestibility (98.58 to 99.73%) in which there were no statistical differences between diets. Digestibility of OM was higher ($P < 0.05$) when cats consumed the Blend diet (97.15%) compared to the Pork diet (93.10%). Fecal scores ranged from 1.55 to 2.63, with Beef (2.63) being statistically higher ($P < 0.05$) than Horse (1.55) and Pork (1.91). Additionally, microbial counts were shown to be highly variable in dietary treatments (E. Coli: 110 to 10,000 cfu/g; total coliforms: 150 to 28,000 cfu/g; yeast: 20 to 4,000 cfu/g; mold count: not detectable to 10 cfu/g; aerobic plate count: 23,000 to 26,000,000 cfu/g). Staphylococcus aureus was not detected in any of the diets. Salmonella was presumptive positive in the Pork and Blend diet, and was negative in the other three diets, but no signs of clinical illness were observed in cats fed any of the evaluated diets. Additionally, salmonella was not serotyped or quantified.

In conclusion, a pork-based raw meat diet is highly digestible and palatable to captive exotic felids and may be a valuable addition among dietary options for zoo managed carnivores. Additionally, microbial populations (aerobic plate counts) in commercial zoo raw meat diets are extremely variable. Therefore, reasonable standardized guidelines may need further consideration for these diets including the evaluation of pathogens not typically analyzed in quality control measurements such as Toxoplasma and Listeria. If large variations in aerobic plate counts do not change clinical outcomes, more specific and meaningful food safety analyses for zoo-managed carnivores may be warranted.