

INFLUENCE OF DIET ON CHARACTERISTICS OF NUTRIENT DIGESTION IN FOSSA (*CRYPTOPROCTA FEROX*)

Nichole Johnson,^{1,2} Cheryl L. Dikeman, PhD,^{1*} Mandi Olsen,¹ Sarah L. Burke,¹ Lee G. Simmons, DVM¹

¹Omaha's Henry Doorly Zoo, Omaha, NE 68107 USA; ²Papillion-La Vista South High School, Papillion, NE 68046 USA

Extended Abstract

Few data are available regarding the nutrition of fossa (*Cryptoprocta ferox*) in captivity. *Cryptoprocta ferox* are one of few carnivore species endemic to the island of Madagascar, found in woodlands or savannas. Although considered opportunistic carnivores, lemur species constitute a significant portion of the fossa diet.¹ Average body lengths of fossa, range from 65-80 cm in addition to a 60-80 cm tail. Fossa are nocturnal, solitary animals with the exception of the mating season. In the wild fossa can live more than 20 years and primarily feed on lemurs, small mammals, birds, reptiles, and insects.¹⁻³ Similar to most captive species studied, a model species was used to establish nutrient requirements and formulation of diets. Due to similarities in carnivorous behavioral idiosyncrasies and gastrointestinal tract anatomies^{1,3,4} the domestic cat appeared to be the most logical nutrition model. Two experiments were conducted to investigate diet digestion characteristics of four captive fossa located in Kingdoms of the Night at Omaha's Henry Doorly Zoo, to compare those characteristics to those of the domestic cat. In experiment 1, four fossa, average weight and age of 8.5 kg and 6.5 years, respectively, and two domestic cats, average weight and age of 5.2 kg and 6.0 years, were fed the same raw beef diet, containing 3.38 kcal/gram dry matter (Table 1) for 14 days, followed by 4 d total fecal collections. Diets were fed to all subjects based on weight maintenance. Diet intake was monitored and recorded daily. In experiment 2, fossa (n=4) were fed their standard zoo diets consisting of beef or beef plus whole prey offered as a rat on alternating days. All diets in both experiments were offered at levels to maintain body condition. Results from experiment 1, indicated digestibility of the raw meat diet was higher (P<0.05) in fossa compared with domestic cats; however, the cats did consume less diet as a result of their smaller size, therefore likely impacting digestibility coefficients (Table 2). Although the domestic cat digested the diet less efficiently, digestibility coefficients for dry matter (DM), organic matter (OM) and crude protein (CP) followed similar patterns to those of fossa. In particular, CP digestibilities were high (83.8 and 90.6%, for cats and fossa, respectively). Caloric intake to maintain body weight was very different between the two species. Fossa consumed 104 kcal/kg BW^{0.67} and domestic cats consumed 54.6 kcal/kg BW^{0.67} kg during experiment 1, resulting in dry matter intakes of 1.50 and 0.93% of body weight for fossa and domestic cats, respectively. During experiment 2, dry matter intake was higher (P<0.05) on days when fossa were offered rats (Table 3). As a result of higher intakes, digestibility coefficients were also higher on days when the whole prey rodents were added to the fossa diets. While these studies described digestibility characteristics of captive fossa, further research is needed with this species to determine specific responses to diets. Energy requirements for fossa are likely higher than domestic cats due to increased activity. Omaha's Henry Doorly Zoo is planning to conduct further digestibility studies with fossa to compare diets containing either raw beef, horsemeat, a low-fat beef diet, or whole prey.

LITERATURE CITED

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Table 1. Dry matter, organic matter, and protein concentrations of diets fed in Experiments 1 and 2. ^{a,b,c}

Variable	Beef diet	Beef-rodent
DM, %	32.6	32.1
OM, %	95.0	93.9
CP, %	48.9	48.6

^a Abbreviations used: DM = dry matter, OM = organic matter, CP = crude protein.

^b Beef diet was Nebraska Brand Special Beef Feline diet (Central Nebraska Packing, North Platte, NE, USA), and Beef-rodent diet included beef diet plus one whole rat with an average as-fed weight of 102.1 g.

Table 2. Dry matter intake, digestibility coefficients for dry matter, organic matter, and protein between cats and fossa fed a raw beef-based diet. ^{a,b}

Variable	Fossa	Cat	P value
DM intake, g/d	129 ± 10.1	48.6 ± 8.01	0.016
DM digestibility, %	87.3 ± 0.96	76.2 ± 0.23	0.049
OM digestibility, %	90.5 ± 0.75	82.0 ± 0.69	0.066
CP digestibility, %	90.6 ± 1.53	83.8 ± 0.14	0.045

^a Least squares means ± SEM. Statistical significance accepted when $p < 0.05$.

^b Abbreviations used: DM = dry matter, OM = organic matter, CP = crude protein.

Table 3. Dry matter intake, digestibility coefficients for dry matter, organic matter, and protein of fossa fed either a raw beef-based diet or beef diet supplemented with whole prey. ^{a,b}

Variable	Beef diet	Beef-rodent diet	P value
DM intake, g/d	113.6 ± 12.1	144.5 ± 12.6	0.0001
DM digestibility, %	83.1 ± 3.94	90.8 ± 1.89	0.047
OM digestibility, %	88.3 ± 2.58	92.7 ± 1.29	0.058
CP digestibility, %	89.4 ± 2.98	94.1 ± 0.97	0.101

^a Least squares means ± SEM. Statistical significance accepted when $p < 0.05$.

^b Beef diet was Nebraska Brand Special Beef Feline diet (Central Nebraska Packing, North Platte, NE, USA), and Beef-rodent diet included beef diet plus one whole rat with an average as-fed weight of 102.1 g.

^c Abbreviations used: DM = dry matter, OM = organic matter, CP = crude protein.