Feed Consumption and Food Passage Time in Mink (*Mustela vison*) and European Ferrets (*Mustela putorius furo*)[1,2]

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Summary | The amount of feed consumed per day and the rate of food passage was measured in mink and European ferrets. Daily feed consumption averaged 40 and 42 g dry matter per kg body weight for male mink and ferrets and 53 and 49 g dry matter per kg body weight for female mink and ferrets, respectively. Using ferric oxide as a feed marker, no differences were observed in food passage time between mink and ferrets or between males and females within each species. The mean time of food passage was 187 minutes for mink and 182 minutes for European ferrets.

Key Words | Animal feeding — Food consumption — Mustelidae

Mink (*Mustela vison*) and European ferrets (*Mustela putorius furo*) are often preferred for research involving virology, nutrition, and reproductive physiology because of certain unique characteristics they possess. These animals are also becoming popular as representative carnivorous species for toxicology testing. In such studies, it is frequently advantageous to know feed consumption and the rate of food passage through the digestive tract. Often, direct comparisons between species would be desirable. However, published values for these parameters are lacking for ferrets and values for mink vary considerably depending upon the animals, diets, and experimental procedures employed. Therefore, during experiments involving mink and ferrets, feed consumption and rate of food passage were determined in situations where diet, age of animals, and management conditions were the same.

Materials and Methods

Feed consumption: The experiment was conducted during February, 1979. The temperature inside the test building ranged from 10-14°C. Twelve adult pastel ranch mink and 12 adult fitch-colored European ferrets were individually housed in cages (60 x 42 x 34 cm) with removable excreta pans. The animals were allowed to acclimate for 10 days prior to initiation of the feeding trial. Each animal received a weighed quantity (in excess of what it would consume) of a basal diet (Tables 1 and 2) daily. Drinking water was provided *ad libitum*. The weight of the uneaten feed was subtracted from the original feed weight. Feed consumption for each mink and ferret was measured during four consecutive days and an average value calculated. Individual body weights were recorded on the initial and final day of the experiment.

Food passage time: This experiment was also conducted during February, 1979, under similar conditions as the feed consumption trial. After a 3-day acclimation period, nine male and nine female mink and ferrets were provided, *ad libitum*, the basal diet to which a dye (ferric oxide) was added at a concentration of 1 g/kg of diet. The time at which each animal first ate the dyed feed was recorded. All animals were observed at approximately 1-minute intervals for the first appearance of dye in the feces. Passage time was calculated as the interval between ingestion of dyed feed and the presence of dye in the feces.

Table 1

Composition of basal diet

Ingredient	Weight (kg)	Percentage
Whole chicken	109	20.0
Commercial mink cereal[a]	91	16.7
Ocean fish scrap[b]	68	12.5
Beef tripe	18	3.3
Cooked eggs	16	2.9
Beef liver	36	6.7
Beef trimmings	18	3.3
Beef lungs	36	6.7
Powdered milk	6	1.1
Added water	146	26.8
Total	544	100.0

[a]XK-40 Grower, XK Mink Foods, Thiensville, WI
[b]Cod, haddock, and flounder

Table 2

Proximate analysis of basal diet

	As fed (%)	Dry wt. basis (%)
Moisture	66.2	—
Crude protein	15.3	45.3
Crude fat	7.5	22.2
Carbohydrate	7.2	21.1
Crude fiber	0.7	2.2
Ash	3.1	9.2

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[2]Approved by the Director of the Michigan Agricultural Experiment Station as journal article number 9751.

Table 3

Body weights and daily food consumption of mink and ferrets

		Body weights (g)		Food consumption			
				per animal (g)		per unit of body wt (g/kg)	
	Number	initial	final	as fed	dry wt	as fed	dry wt
Males							
Mink	6	1822 ± 95.2[a,b]	1823 ± 100.0	217.2 ± 10.14	73.4 ± 3.43	119.4 ± 4.76	40.3 ± 1.61
Ferret	6	1923 ± 95.2	1940 ± 100.0	236.2 ± 10.14	79.9 ± 3.43	123.6 ± 4.76	41.8 ± 1.61
Females							
Mink	6	873 ± 35.5	861 ± 37.6	134.5 ± 9.19	45.5 ± 3.11	155.3 ± 7.47	52.5 ± 2.52
Ferret	6	791 ± 35.5	786 ± 37.6	115.4 ± 9.19	39.0 ± 3.11	145.5 ± 7.47	49.2 ± 2.52

[a]Mean ± standard error
[b]Difference between means within species and sex were not significantly different ($p>0.05$)

The data were subjected to a one-way analysis of variance. Differences between means was determined by the Student's *t* test.

Results

Feed Consumption: No significant difference was found between the amount of feed consumed per day by mink and ferrets of the same sex (Table 3). Although consuming a greater quantity of feed per day, male mink and ferrets ate less per unit body weight than female animals.

Both species were observed to eat small quantities of feed several times per day rather than a large meal all at once. The animals wasted considerable amounts of feed by carrying the feed around in their mouths and then dropping it through the wire bottoms of the cages. This trait was most pronounced in mink.

Food passage time: No significant difference in food passage time was found between mink and ferrets or between male and female animals (Table 4). The ferric oxide did not appear to adversely affect the palatability of the diet, as both species readily consumed the dyed feed. The time necessary for the food to pass through the digestive tract of both species averaged just over 3 hours. Food passage time for mink ranged from 138 to 235 minutes and for ferrets from 148 to 219 minutes.

Table 4

Food passage time of mink and ferrets

	Food passage time (min)			
	Number	Mink	Number	Ferret
Males	9	186.2 ± 8.68[a,b]	9	180.7 ± 6.53
Females	9	187.4 ± 11.19	9	183.0 ± 7.24
Overall mean	18	186.8 ± 9.72	18	181.8 ± 6.70

[a]Mean ± standard error
[b]Difference between means within species and sex were not significantly different ($p>0.05$)

Discussion

Mink and ferrets were found to consume comparable quantities of feed. Both species were of nearly equivalent size and so would appear to require similar amounts of food per day. These carnivores have a relatively short digestive tract (1) of small capacity. The intestinal tract of the mink is only four times the body length (2). This is in agreement with the animals' behavioral characteristic of numerous small meals throughout the day. Ferrets given free access to feed eat 9-10 meals per day (3); a similar pattern was observed in mink.

The rate of food passage (3 hours) for mink and ferrets is considerably shorter than that of most other monogastric species (2). This rapid passage of food through the digestive tract suggests less time for digestion and absorption of dietary constituents, as well as decreased microbial digestion and synthesis in the gut. Thus, these animals are well adapted to utilize diets high in protein and low in fiber (4,2). Since complete removal of food remnants from the digestive tract of mink occurs within 15-20 hours after ingestion (2), frequent meals help to keep food in the alimentary tract much of the time.

The values reported in this paper for food passage times are in general agreement with the 2-4 hours reported for diets labeled with fusin-stained straw (5) and the 142 minutes for carmine-died diets (6) for mink, but are somewhat greater than the food passage times for mink of 106 minutes, 123 minutes, and 109 minutes for Sudan III, charcoal, and chromium oxide-labeled diets, respectively (1).

Although such factors as animal age, physical condition of the animal, environment, diet composition, physical form of the feed, and management procedures may all affect feed consumption and food passage times, under the same experimental conditions these parameters were found to be comparable in mink and European ferrets.

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