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Running Header: **Swift fox scat**

Introduction

In an attempt to increase the reliability of the identification of contents of Swift fox scat an experiment was conducted to trace the passage of food items in the scat of a single Swift fox that was in rehabilitation. Although several studies have been conducted on Swift fox diets (Hines, and Case, 1991, Rongstad, Laurion and Anderson, 1989, Uresk, Daniel W. and Jon C. Sharps, 1986, Zumbaugh and Choate, 1985), little information was found on the identification of the items found in Swift fox scat. During the course of the study hard material and hair was used in scat content identification. The analysis was also intended to identify problems with the use of hair and feathers for identification. The final purpose of the study was to examine the length of time it took for different food items to pass through the alimentary tract of the Swift fox.

Methods

The Swift fox chosen for the pilot study was "Dakota", a one year old animal that had received a leg injury and had been placed in a 2.4 m X 1.2 m X 0.75 m high enclosure for rehabilitation from surgery. The pen had a plywood floor, wire mesh sides and top with a wood enclosed sleeping compartment at one end. The mesh size of the wire on the enclosure was 2.5 cm X 1.25 cm.

Before the experiment began the enclosure was cleaned thoroughly, and all scat and uneaten food items were removed. Beginning on 12 July, 1994 a weighed

amount of food was presented to “Dakota” each evening at approximately 8:00 PM. Scat and uneaten food were collected from the enclosure prior to feeding for each night of the experiment. Scat and uneaten food were weighed to the nearest gram (wet weight).

The food items feed over the 15 days were day old chick, horse meat, IAMS puppy chow, *Microtus pennsylvanicus* (Meadow vole), *Microtus longicaudus* (Long-tailed vole), *Spermophilus richardsonii* (Richardson’s ground squirrel), juvenile *Turdus migratorius* (American robin), juvenile *Junco hyemalis* (Dark-eyed Junco), and grasshoppers.

The scat collected were soaked in water for 30 minutes. After soaking but while still in the water the contents were pulled apart using two pairs of dissecting tweezers. The water was then sifted through a series of sieves down to a mesh size of 0.5 mm. The sifted contents were identified and stored in 70% alcohol or formaldehyde. Identification of hair and fine matter was done with a 10X hand lens and an American Optical dissecting scope (X10 ocular and X4, X10, X40 and X100 exocular). The species identification of the material whether mammalian or insect was done by comparison with the reference collection.

Results and Discussion

Table 1 summarises the food presented to “Dakota” and the food items found in the scat over the 15 days of the study. Table 2 summarises the wet weight of food items presented, and uneaten food for the study.

Dakota’s daily diet averaged 314 gm wet weight per day. The average uneaten food per day was 60 g. The total wet weight of scat collected during the study was 164 gm, giving an average of 11 gm per day.

The results provided insight into the preferences in food items by a captive Swift fox. Dakota ate high proportions of the Day-old chicks (94%), horse meat (62%), *Mictorus spp.* (70%), Richardson ground squirrels (74%) and grasshoppers (100%) presented. The most common diet for the captive breeding colony was day-old chicks and horse meat, so high consumption of these familiar food items was expected. The high consumption of *Mictorus spp.*, Richardson ground squirrels and grasshoppers suggested that these items were more palatable.

The preliminary study also provided useful information on the general composition of swift fox scat, and how this relates to the food eaten. Of the nine different food-types given to Dakota during the study, identifiable remains of all but two (horse meat and IAMS) were isolated from scat. The horse meat and IAMS yielded no recognisable, undigested remains after sifting and washing of scat contents. It was observed however, that many scats which contained little evidence of consumption of the other food-types, were made up to a large extent, of a red-brown, clay-like

substance, which disintegrated in water and was not retained by sifting. The red-brown, clay-like substance was assumed to be primarily the product of consumption of horse meat because it occurred most commonly after the feeding of that food item.

Observations on the individual food items were:

Day-old chicks: Day-old chicks appeared in the scat the day after consumption and continued to appear for two days. The types of remains produced were: feathers, skin from around the lower leg and foot (identifiable by its scaly structure), whole claws, claw-coverings, and limited amounts of bone.

Mocrotus spp: *Microtus* spp were found in scat one, two and three days after ingestion. They were identified by both hair and bone. The hard materials from these species were a single humerus bone from *M. longicaudus*, a molar tooth from *M. pennsylvanicus* and a mandibular ramus from *M. pennsylvanicus*.

Spermophilus richardsonii: Hair from Richardson's ground squirrel was found in scat one and two days after it was consumed. Fragments of bones were found both two and six days afterwards they were consumed. A single claw from *Spermophilus richardsonii* was also found seven days after the ground squirrel was consumed. This indicates a considerable period of retention in the gut for some hard materials.

Juvenile passerines: Feathers from these birds were found in scat one and two

days after consumption. The quantity of feathers found two days after consumption was significantly more than on the first day.

Grasshoppers: Grasshopper remains were found in scat one, two and three days after consumption. On the first day the remains included many very small shards of chitin, on day two they included one leg and one large, thoracic section of exoskeleton, day three included two legs and some more fragments of chitin.

Literature Cited:

Hines, Terrence D. and Ronald M. Case (1991) Diet, Home Range, Movements and Activity Periods of Swift Fox in Nebraska. *Prairie Nat.* 23(3):131-138

Rongstad, Orrin, J., Thomas R. Laurion and David E. Anderson (1989) Final Report, February 1989, Ecology of Swift Fox on the Pinon Canyon Manoeuvre Site, Colorado. Submitted by, Wisconsin Co-operative Wildlife Research Unit, University of Wisconsin to Directorate of Engineering and Housing, Fort Carson, Colorado.

Uresk, Daniel W. and Jon C. Sharps (1986) Denning Habitat and Diet of the Swift Fox in Western South Dakota. *Great Basin Naturalist* 46(2):249-253.

Zumbaugh, D.M. & Choate, J.R. (1985). Winter food habits of the swift fox on the

central high plains. Prairie Nat. 17(1): 41-47.

Table 2: Summary of the weight of food presented and uneaten by “Dakota” over the 15 days of the study.

| Food type | Food presented (g) | Uneaten food (g) | Percent Uneaten |
|------------------------------------|--------------------|------------------|-----------------|
| Day-old chicks | 2600 | 94 | 3% |
| Horse meat | 1008 | 380 | 37% |
| IAMS | 424 | 217 | 51% |
| <i>Microtus longicaudus</i> | 160 | 60 | 37% |
| <i>Microtus pennsylvanicus</i> | 39 | 0 | 0% |
| <i>Spermophilus richardsonii</i> | 710 | 186 | 26% |
| Juvenile <i>Turdus migratorius</i> | 40 | 20 | 50% |
| Juvenile <i>Junco hyemalis</i> | 15 | 10 | 67% |
| Grasshoppers | 33 | 0 | 0% |
| Total | 5029 | 968 | 30% |