

# FOOD OF THE SILVER FOX *VULPES CHAMA*

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## INTRODUCTION

The silver fox *Vulpes chama* (H. Smith) is restricted to southern Africa, where it occurs in parts of the Cape Province, the Orange Free State, Transvaal, western Rhodesia and northern South West Africa (Meester, Davis and Coetzee 1964). Shortridge (1934 p. 179) describes its habits as follows: "The South African Silver Fox is nocturnal, occasionally crepuscular, and goes about singly or in pairs. It prefers the more open sand-plains or scrub-dotted Karrooveld, and concentrates about the bases of kopjes or stony ridges provided that the surroundings afford suitable bush or rock cover under which to lie up by day."

The silver fox lives mainly on small mammals, birds and insects and seldom attacks domestic stock (Sclater 1900, Shortridge 1934, Roberts 1951), but suffers severely from the stigma attached to virtually any "fox" or "jackal" in southern Africa as killers of farm animals. Thus many farmers destroy the silver fox whenever they encounter it.

Examination of the stomach contents of the silver fox was undertaken to determine its normal diet under modern conditions. Although the number of specimens is small, the paucity of data for the species justifies publication of the results, while further work continues.

## MATERIAL AND METHODS

Forty stomachs were collected between 1961 and 1964, mostly from the Transvaal: Belfast 6, Bloemhof 13, Delmas 1, Dullstroom 2, Heidelberg 1, Machadodorp 3, Middelburg 1, Schweizer Reineke 2, Standerton 3, Warmbaths 1 and Wolmaransstad 4. Two stomachs were obtained from Robertson, Cape Province and one from Frankfort in the Orange Free State. Eleven stomachs came from nature reserves and twenty-nine from agricultural areas with a sheep population exceeding 50 per square mile (Bureau of Census and Statistics 1953-54).

Too little material was available for analysis of seasonal influence on food habits or food preferences of sexes. Ten stomachs were collected in summer, eighteen in autumn, five in winter and five in spring. The dates of the remaining two were unknown, and information on foods (other than sheep) available in the collecting areas was wanting.

Stomach contents were analysed volumetrically and by frequency of occurrence (Tables 1 and 2), following Grafton's (1965) method, except that his "non-food" (grass, stones, grit and sand) were included when measuring volumes. Some foods could not be identified further than major taxa (e.g. mammal, insect) and using Grafton's (1965) definition of carrion, any putrid item or one accompanied by maggots was so regarded.

Three of the 40 stomachs were empty. The figures for percentage by volume were thus calculated from 37 stomachs with a total content of 2,359 cc (av. 59 cc, max. 170 cc).

An "index number" was assigned to food items in the diet according to their importance by volume (Table 1) and by frequency (Table 2). By adding these indices (Table 3), it is considered that one obtains a figure that more accurately reflects the relative importance of various food items than is given by either volumetric or frequency measurements stated separately.

#### FINDINGS AND DISCUSSION

Rodents constituted the major single food source for the silver fox, followed by carrion, insects, grass and hares (Table 3).

##### MAMMALS

The rodents included rats and mice (13 stomachs), the mole rat *Cryptomys hottentottus* (5 stomachs) and one springhare *Pedetes capensis*. The murids were identified as *Aethomys namaquensis*, *Dendromus sp.*, *Praomys natalensis*, *Mus minutoides*, *Mystromus albicaudatus* and *Tatera brantsi*. The only other mammals recorded were unidentifiable hares (3 stomachs) and (as carrion) a single steenbok *Raphicerus campestris*, the latter identified by examination of the hair structure.

*Carrion* was exceeded only by rodents in relative order of importance in this study and it would seem to form an important item in the diet of the silver fox.

##### OTHER ANIMAL FOOD

Bird remains usually consisted of feathers only and no evidence of poultry was found. One stomach contained lizard scales.

The insects included flies (probably from carrion), grasshoppers, flying termites, beetles and weevils. Three arachnids were found: a trap-door spider, a solifugid and a scorpion.

##### DOMESTIC STOCK

No evidence of domestic stock was found in this study. Both Sclater (1900) and Shortridge (1934) state that the silver fox does not interfere with domestic stock and Roberts (1951) doubts reports that it attacks young lambs. I have received a reliable report of three lambs having been killed by silver foxes in the Christiana district. Because the silver fox is unable to kill adult sheep and goats flocks would be in danger only during the lambing season.

##### PLANT FOOD

Grass, usually in small amounts, occurred in 51 percent of the stomachs. In one stomach grasses amounted to 18.0 cc (23 per cent of the contents) and in another to 16.0 cc (53 per cent). The grasses found were identified as *Panicum coloratum*, *Eragrostis atherstonei* and a species of *Brachiaria*. Two sedges *Scirpus sp.* and *Bulbostylis sp.* were also found. Grafton (1965) regards

TABLE 1  
 VOLUMETRIC ANALYSIS (PERCENTAGE BY VOLUME) OF STOMACH CONTENTS OF THE SILVER FOX,  
 BASED ON THE CONTENTS OF 37 STOMACHS WITH A TOTAL VOLUME OF 2359 CC

Item	Total volume in cc	Percentage by volume	Relative importance
Animal food .. .. .	2254.6	95.6	—
Vertebrata .. .. .	1712.1	72.6	—
Mammalia .. .. .	1682.2	71.3	—
Rodentia .. .. .	1323.8	56.1	1
Lagomorpha .. .. .	150.7	6.4	3
Artiodactyla .. .. .	109.0	4.6	4
Unidentified .. .. .	98.7	4.2	—
Aves .. .. .	29.4	1.2	—
Wild birds .. .. .	28.9	1.2	7
Wild bird's egg .. .. .	0.5	Trace	12
Reptilia (lizard) .. .. .	0.5	Trace	12
Invertebrata .. .. .	177.5	7.5	—
Insecta .. .. .	107.4	4.5	5
Arachnida .. .. .	23.0	0.9	9
Unidentified .. .. .	47.0	2.0	—
Carrion .. .. .	344.0	14.6	2
Plant food .. .. .	83.9	3.5	—
Wild fruit, berries and seeds .. .. .	27.0	1.1	8
Cultivated crops .. .. .	5.0	Trace	10
Grass .. .. .	45.5	1.9	6
Unidentified .. .. .	6.4	Trace	—
Stones, grit and sand .. .. .	4.8	Trace	11
Internal parasites .. .. .	6.2	Trace	—

grass as “non-food” in the diet of the black-backed jackal, because its high fibre content renders it indigestible to a true carnivore. I believe that the silver fox *does* eat grass intentionally, and that during prolonged starvation grass may provide the coarse material necessary to keep the digestive system functional.

Other types of vegetation, especially wild fruits, berries and seeds, are certainly eaten intentionally by both the black-backed jackal (Grafton 1965) and the silver fox. The most frequent wild fruit was the “jakkalsbessie” *Diospyros lycioides*. Other plants identified were *Acacia mearnsii*, *Kohautia virgata*, a species of *Thesium* (Santalaceae) and a composite *Geigeria*. One stomach contained ground-nuts. Because numerous pieces of dried nut-shells were found with the nuts, the indications were that the fox had eaten the ground-nuts after they had been stacked to dry.

Thus although the silver fox primarily eats animal food, it also resorts to vegetable matter.

TABLE 2  
PERCENTAGE OCCURRENCE OF ITEMS IN DIET OF THE SILVER FOX, DETERMINED FROM THE CONTENTS  
OF 37 STOMACHS

<i>Item</i>	<i>Number of stomachs</i>	<i>Percentage occurrence</i>	<i>Relative importance</i>
Animal food .. .. .	37	100.0	—
Vertebrata .. .. .	29	78.4	—
Mammalia .. .. .	28	75.7	—
Rodentia .. .. .	20	54.0	1
Lagomorpha .. .. .	3	8.1	8
Artiodactyla .. .. .	1	2.7	10
Unidentified .. .. .	4	10.8	—
Aves .. .. .	7	18.9	—
Wild birds .. .. .	6	16.2	6
Wild bird's egg .. .. .	1	2.7	10
Reptilia .. .. .	1	2.7	10
Invertebrata .. .. .	14	37.8	—
Insecta .. .. .	13	35.1	3
Arachnida .. .. .	3	8.1	8
Unidentified .. .. .	5	13.5	—
Carrion .. .. .	7	18.9	5
Plant food .. .. .	21	56.7	—
Wild fruit, berries and seeds .. .. .	5	13.5	7
Cultivated crops .. .. .	1	2.7	10
Grass .. .. .	19	51.3	2
Unidentified .. .. .	2	5.4	—
Stones, grit and sand .. .. .	13	35.1	3
Internal parasites .. .. .	8	21.6	—

TABLE 3  
CUMULATIVE RELATIVE IMPORTANCE OF ITEMS IN THE DIET OF THE SILVER FOX, LISTED IN  
DESCENDING ORDER OF IMPORTANCE

<i>Item</i>	<i>Combined* value</i>	<i>Cumulative relative importance</i>
Rodentia .. .. .	2	1
Carrion .. .. .	7	2
Insecta .. .. .	8	3
Grass .. .. .	8	3
Lagomorpha .. .. .	11	5
Wild birds .. .. .	13	6
Artiodactyla .. .. .	14	7
Stones, grit and sand .. .. .	14	7
Wild fruit etc. .. .. .	15	9
Arachnida .. .. .	17	10
Cultivated crops .. .. .	20	11
Reptilia .. .. .	22	12
Wild bird's egg .. .. .	22	12

\*Added relative importance values of tables 2 and 3.

STONES, GRIT AND SAND were probably swallowed unintentionally. Sand was present as a trace in practically all stomachs.

#### PARASITES

The internal parasites found were almost exclusively nematodes. These were identified as one species each of the genera *Ascaris*, *Physaloptera* and *Ancylostoma*. A cestode *Diphylidium caninum* and an unidentified Acantocephala also occurred. Nematodes were present in all stomachs, except those collected in spring, and were particularly prevalent in those collected in summer. The only external parasite found in the stomach contents was *Sarcoptes scabiei*.

#### SUMMARY

The silver fox is not a harmful predator. Food studies indicate that it eats no food of agro-economic importance and that its control as practised in some parts of South Africa is not only economically unjustifiable but also ecologically undesirable.

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