

# THE DIET SELECTION OF THE ELAND (TAUROTRAGUS ORYX) IN NORTH-EASTERN NAMIBIA

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## ABSTRACT

In a series of trials the feed intake of free-ranging eland was estimated directly by means of the esophageal fistula technique at Sonop Research Station in the north-east of Namibia. The feed intake was estimated over a period of three years. An evaluation of the percentage bush, grass, and weeds in the diet was also assessed.

## INTRODUCTION:

The diet selection in wildlife species throughout Southern Africa, has not been estimated in many cases. There exists a rough division of the types of feeders, i.e. bulk grazers, selective grazers and browsers. Specific diet selection data on many wildlife species, making use of esophageally fistulated animals in a free-ranging environment, are however unknown. With the pending bush encroachment problem in central-north and north-eastern Namibia, research into an animal which could use this excess browse was initiated.

## STUDY AREA:

The Sonop Research Station of the Ministry of Agriculture, Water and Rural Development is located at approximately 18°55' S and 19°25' E, 120 kilometres north-east of Grootfontein in Namibia. It covers an area of 5457 ha and is enclosed by a 3,0 m high game-proof fence. The farm is divided into two halves by a District Road. The Research Station is part of the Kalahari sand-savannah vegetation area of northern Namibia. The topography are dunes, separated by interdune valleys.

The most prominent woody vegetation present on the dunes is, *Bauhinia petersiana*; *Baphia massaiensis*, *Grewia flavescens*, *Commiphora glandulosa*, *Croton griseus*, *Ochna pulchra*, *Combretum collinum*, *Lonchocarpus nelsii*, and *Terminalia sericea*.

The interdune valleys are open and the more prominent shrubs are *Acacia mellifera*, *Rhigosum brevispinosum*, *Bauhinia petersiana*, *Combretum engleri*, *Ozoroa paniculosa*, *Baphia massaiensis* and *Acacia erioloba*.

## MATERIALS AND METHODS:

The main aim of the project concerning the eland was the determination of the diet selection of the eland. The data that would emanate from this study would determine if the eland were grazing/browsing complementary or in competition to cattle in the same area.

Three eland, two 18-month old heifers and one 12-month old bull were esophageally fistulated and given two months to recuperate from the operation. From May 1991 until May 1994 the animals were subjected to diet sampling. This was performed by placing the animals into prescribed camps

once a month for one hour during the early morning and one hour during the afternoon. The diet was then sampled using the method described by Bredon *et al.* The animals were not subjected to starvation before samples were taken. The animals were kept in a kraal at night and the next morning they were put into a camp to feed. After an hour they were translocated to the camp in which the samples were to be taken.

A key of all the woody plant species was set up and used in identifying the samples. Thirty-six months of data was processed, i.e. 36 X 400 pieces identified X 3 animals = 43,200 samples. These samples were identified macroscopically and if they were too minute a stereoscopic microscope was used.

Samples were then chemically analysed and microscopically identified using the 400X400 grid method (Campbell *et al.*). After this the samples were divided macroscopically into three different categories, i.e. woody plants, grasses and weeds. The samples (woody, grasses and weeds) were then dried and weighed on a dry basis to determine the percentage browse, grass and weeds on a dry basis present in the diet of the eland.

## RESULTS AND DISCUSSION:

In this paper we shall only deal with the diet selection of the eland, i.e. the identification of the diet that was selected by the animals. The diet selection of the eland during each month for the years 1991 to 1994 is given in Table 1. The percentages of the 7 most-utilised woody plant species as well as the grasses, pods and weeds for the 1991/1992 season are given in Graph 1. The selection by the animals during the following two years is given in Graphs 2 and 3. Analyzing these graphs it can be observed that *Baphia massaiensis* was well utilized in the drier season. Other woody plants that were also utilized quite frequently, include *Bauhinia petersiana*, *Combretum collinum*, *Croton griseus*, *Lonchocarpus nelsii*, *Mundulea sericea*, and *Terminalia sericea*. The percentages shown in these graphs depict the percentage of the particular species in the 400 point analysis. This does not show the percentages of the different woody plants in the diet, but only the species that are utilised. It can be observed from the graphs that grass species, pods and weeds are well utilized during the rainy season, but after the rainy season their utilization diminishes. The percentages of the woody plants, grass, pods and weeds differ from year to year and this seems to be correlated to the rainfall figures of the corresponding months of the years. Months in which rainfall figures were relatively high were also marked by a higher intake of grasses, weeds and pods.

Table 2 indicates the percentage woody plants, grasses, pods and weeds in the samples on a dry-matter basis. From the table it can be observed that the eland is a browser during most of the year.

This is graphically illustrated in Graph 4.

These results tend to bring us to the conclusion that the eland can be used in a complementary controlled beef production system, if the diet is taken as a parameter. Further studies into the utilization of the vegetation together with cattle, eland on their own, and cattle on their own, are to begin in the near future.

**REFERENCES:**

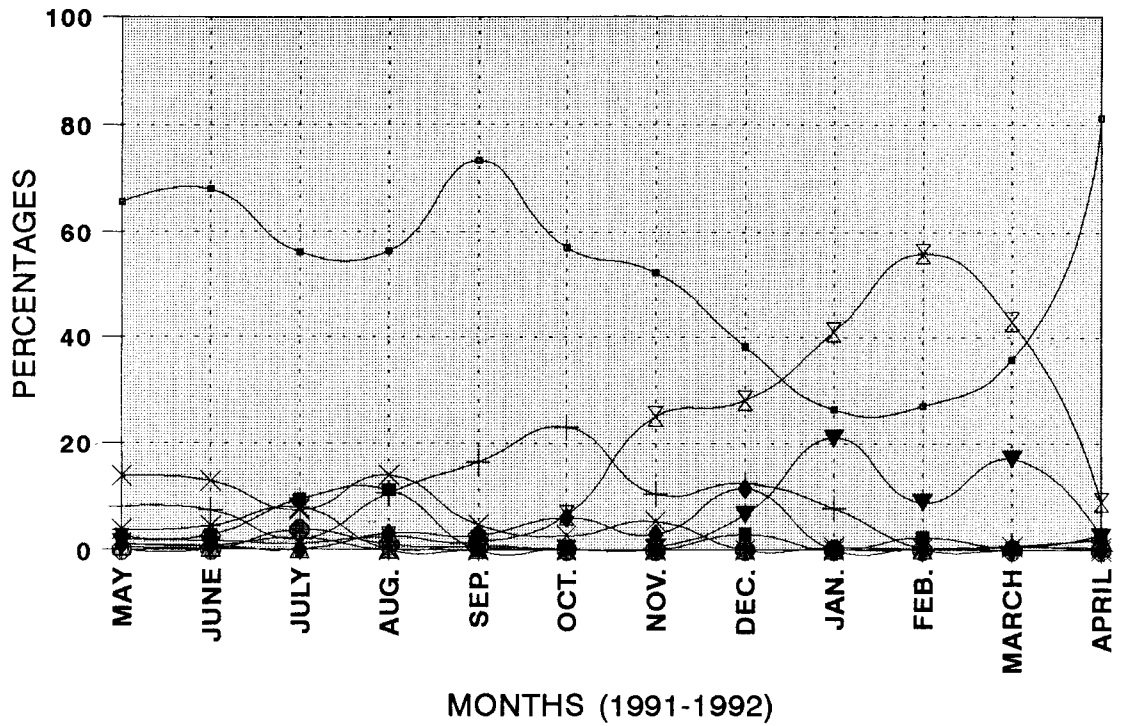
- BATH, D.L., W.C. WEIR, and D.T. TORELL. 1956. The use of the esophageal fistula for the determination of consumption and digestibility of pasture forage by sheep. *J. Anim. Sci.* 15:1166-1171.
- CAMPBELL, C.M., K.S. ENG Jr., A.B. NELSON, and L.S. POPE. 1968. Use of esophageal fistula in diet sampling with beef cattle. *J. Anim. Sci.* 30:231-234.
- CHAPMAN, H.W. and F.J. HAMILTON. 1962. Esophageal fistulation in calves. *Aust. Vet. Jour.* 38:400.
- COOK, C.W., J.L. THORNE, J.T. BLAKE, and J. EDLEFSEN. 1958. Use of an esophageal fistula cannula for collecting forage samples by grazing sheep. *J. Anim. Sci.* 22: 579-581.
- CROKER, B.H. 1959. A method of estimating the botanical composition of the diet of sheep. *N.Z.J. Agr. Res.* 2: 72-85.
- FREE, J.C., R.M. HANSEN, and P.L. SIMS. 1971. Methods of estimating dry-weight composition in diets of herbivores. *J. Anim. Sci.* 32: 1003-1008.
- GRIMES, R.C. and B.R. WATKINS 1965. The botanical and chemical analysis of herbage samples obtained from sheep fitted with esophageal fistulae. *J. Brit. Grasslands Soc.* 20:168-170.

Table 2: Utilization of forages as percentage of intake

MONTH	% GRASS	% WEEDS	% BUSH
AUG '91	0.5	0.5	99
SEP '91	0.25	0.5	99.3
OCT '91	1.46	0.97	97.6
NOV '91	7.27	0.9	91.8
DEC '91	4.88	25.3	69.8
JAN '92	8	1.86	90.1
FEB '92	9.44	6.67	83.9
MAR '92	9.68	3.69	86.6
APR '92	0.71	0.24	99.1
MAY '92	0.52	0.17	99.3
JUN '92	0.15	0.15	99.7
JUL '92	0.52	0.13	99.4
AUG '92	1.71	0.31	98
SEP '92	0.7	0.23	99.1
OCT '92	0.35	0.53	99.1
NOV '92	0.5	0.5	99
DEC '92	0	0.5	99.5
JAN '93	0.37	0.37	99.3
FEB '93	4.31	23	72.7
MAR '93	0.83	11.7	87.5
APR '93	0.2	0.4	99.4
MAY '93	0.84	0.64	98.5
JUN '93	1.7	0.57	97.7
JUL '93	2.53	1.32	96.2
AUG '93	3.24	2.56	94.2
SEP '93	7.12	2.49	90.4
OCT '93	9.2	2.4	88.3
NOV '93	3.5	3.5	93
DEC '93	14.4	15.9	69.7
JAN '94	7.91	12	80.1
FEB '94	0	9.12	90.9
MAR '94	1	1.58	97.4
APR '94	0.35	0.47	99.2

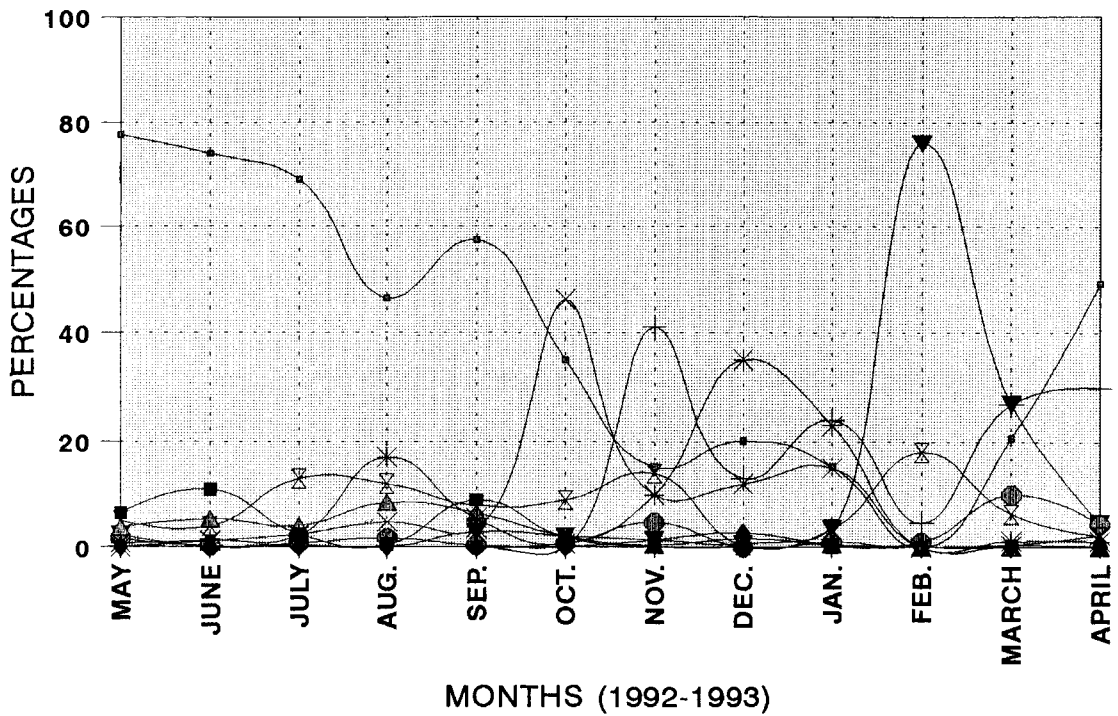
TABLE 1 : DIET SELECTION OF ELAND IN NORTH-EASTERN NAMIBIA

PERCENTAGES	MAY '91	JUN '91	JUL '91	AUG '91	SEP '91	OCT '91	NOV '91	DEC '91	JAN '92	FEB '92	MAR '92	APR '92	MAY '92	JUN '92	JUL '92	AUG '92	SEP '92	OCT '92	NOV '92	DEC '92	JAN '93	FEB '93	MAR '93	APR '93	MAY '93	JUN '93	JUL '93	AUG '93	SEP '93	OCT '93	NOV '93	DEC '93	JAN '94	FEB '94	MAR '94	APR '94		
A. erioloba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
B. massaliensis	65.66	68.07	56.05	56.35	73.38	57.00	52.28	38.14	26.28	27.00	35.71	81.19	77.37	74.87	69.29	46.75	57.66	35.39	15.46	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88	15.15	20.88
B. petrosiana	8.02	7.43	1.98	10.66	16.42	22.95	10.46	12.47	7.79	0.23	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. collinum	1.00	0.74	0.25	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. timberbe	3.76	4.46	7.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. hereroense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. platodes	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. africana	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. agulensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. gratissimus	2.51	2.72	9.38	11.17	13.96	4.73	2.66	5.36	0.49	0.23	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
G. bicolor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. flava	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. flavescens	0.00	0.00	1.98	0.00	0.00	0.00	0.00	0.00	0.97	0.80	0.00	2.92	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
L. nelsii	13.78	12.87	7.41	13.96	7.41	13.96	4.73	2.66	5.36	0.49	0.23	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
M. senica	1.00	0.74	0.25	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. pulchra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P. africanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R. buergeri	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. senica	0.50	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z. mucronata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ximena	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grasses	2.01	1.73	1.23	2.54	1.49	6.52	24.93	27.63	41.36	56.34	43.10	9.02	5.11	4.06	13.02	12.75	8.03	9.03	14.21	0.49	3.54	18.18	6.45	2.23	20.85	15.75	31.29	27.82	16.92	36.18	32.56	44.11	31.92	40.4	9.32	2.49		
Pods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Weeds	1.25	0.74	2.22	0.00	0.75	0.24	0.54	6.60	21.17	8.92	16.90	2.58	2.43	0.00	0.49	0.00	2.92	2.14	1.50	0.74	3.79	76.01	27.54	4.70	10.70	2.00	6.82	6.02	3.23	28.89	11.79	33.33	53.12	43.94	17.63	1.49		



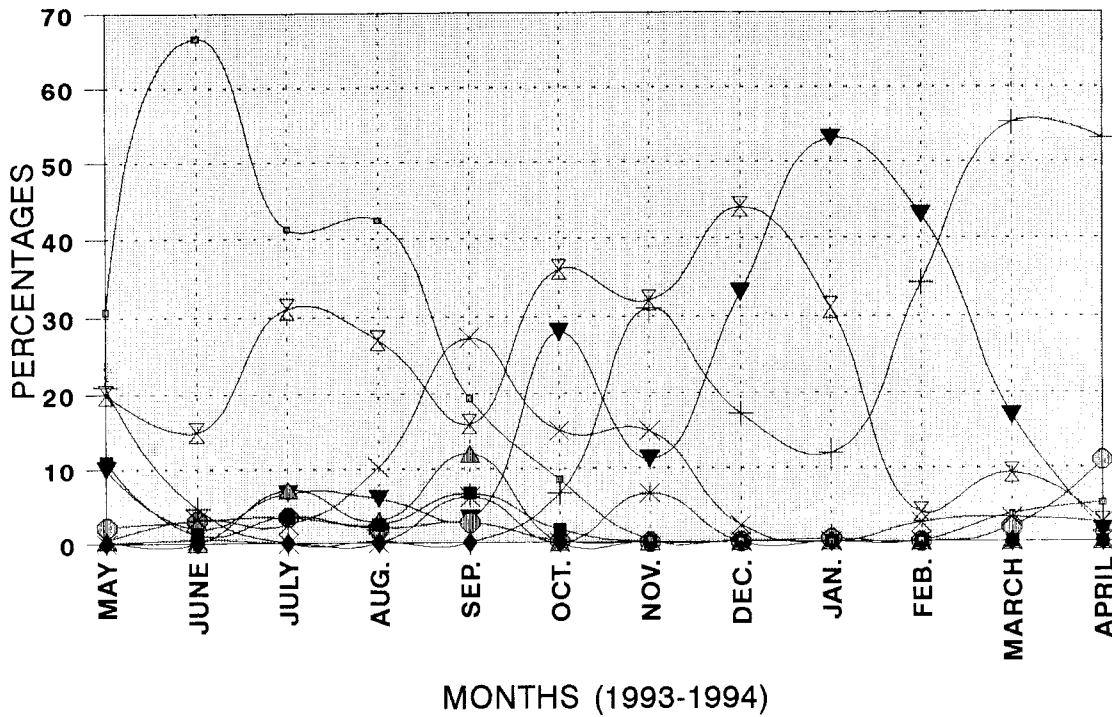
+ B. massaiensis    + B. petersiana    \* C. collinum    ■ C. gratissimus    × L. nelsii  
 ◆ M. sericia    ▲ T. sericia    ⊠ Grasses    ● Pods    ▼ Weeds

GRAPH 1: DIET SELECTION OF ELAND  
SONOP RESEARCH STATION (1991-1992)



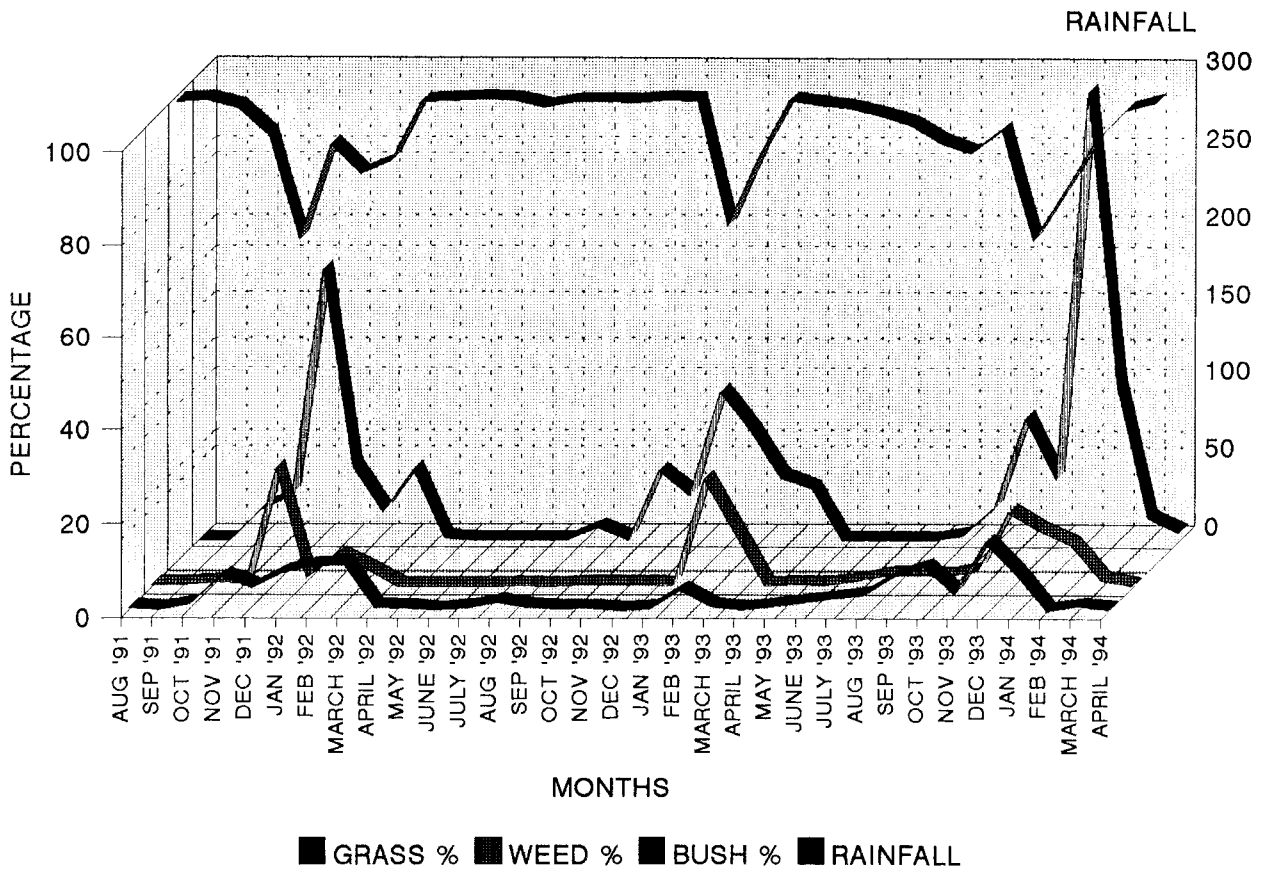
+ B. massaiensis    + B. petersiana    \* C. collinum    ■ C. gratissimus    × L. nelsii  
 ◆ M. sericia    ▲ T. sericia    ⊠ Grasses    ● Pods    ▼ Weeds

GRAPH 2: DIET SELECTION OF ELAND  
SONOP RESEARCH STATION (1992-1993)



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GRAPH 3: DIET SELECTION OF ELAND  
SONOP RESEARCH STATION (1993-1994)



GRAPH 4: UTILIZATION OF FORAGE BY ELAND  
AT SONOP RESEARCH STATION