# Food selection in young naive impala *Aepyceros melampus*

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Many studies have been carried out on the feeding behaviour of adult antelope, but few on the development of feeding habits in lambs. In the present study an attempt is made to determine some of the mechanisms by which young naive animals select food plants. The findings are discussed in the light of similar work done by Leuthold (1971).

During December 1979 eight impala *Aepyceros melampus* lambs were caught on the Nylsvley Provincial Nature Reserve by the Transvaal Nature Conservation Division game capture team. When caught, the lambs were 2 – 5 days old. They were subsequently housed in a 10 × 12 m pen at the Nature Reserve and hand-fed on powdered milk enriched with vitamins. The walls of the pen were covered with hessian to prevent the lambs from injuring themselves on the wire fencing, but at the same time the hessian also prevented the impala from seeing or coming into contact with the outside vegetation. The pen itself contained little accessible vegetation.

During January 1980, when the lambs were approximately 2 – 3 weeks old, they were presented daily with three new species of indigenous vegetation. Each morning, usually between 07h00 and 08h00, large branches bearing fresh green foliage were cut and hung on the walls of the pen. The lambs were observed for 15 – 20 min (starting from the time the branches were hung), during which their response to each species was recorded and categorised into (i) accept; (ii) smell and reject; and (iii) taste and reject. The branches were left in the pen for the remainder of the day, and the lambs were supplied with additional preferred branches. Only three plant species were presented to the impala at a time because for any number greater than three it became difficult for a single observer to record the behaviour of all eight lambs. Later in the month however, to eliminate the possibility that some plants may have been rejected simply because they were offered together with more preferred species, thirteen species were presented to the animals a second time in combination with different plant species.

The vegetation already in the pen included *Vitex rehmannii, Combretum molle* and *Combretum apiculatum*. The two *Combretum* species were tall inaccessible trees, while the lambs were observed to reject both the *V. rehmannii* growing in the pen and branches brought in from outside bushes. Over a period of 25 days, a total of 45 woody plant species and three common herbs were presented to the impala. Ten (21%) species were accepted immediately, 21 (44%) were smelt and rejected, and 17 (35%) were tasted and rejected (Table 1). In the latter category the branches were sampled by 1 – 3 individuals only; these lambs either ran their lips lightly over the leaves or else chewed 1 – 2 leaves. The remaining lambs rejected the plants on smell alone. In the case of *Pavetta zeyheri*, one lamb having pulled off part of a leaf, immediately spat it out and began to lick its lips as if to get rid of a bad taste. Thirteen species, all of which had originally been rejected by most of the impala on smell and presented to them a second time, were rejected by all the impala (Table 2).

**Table 1** The response of eight young naive impala lambs to 45 woody plant species and three common herbs (*) presented to them in January 1980

| Accept | Smell and reject | Taste and reject |
|---|---|---|
| *Acacia nilotica* | *Croton gratissimus* | *Acacia mellifera* |
| *Acacia tortilis* | *Diospyros lycioides* | *Barleria bremekampii* |
| *Asparagus saundersiae* | *Diplorhynchus condylocarpon* | *Burkea africana* |
| *Bridelia mollis* | *Euclea natalensis* | *Carissa bispinosa* |
| *Combretum apiculatum* | *Fadogia monticola* | *Combretum zeyheri* |
| *Combretum molle* | *Gardenia spatulifolia* | *Dombeya rotundifolia* |
| *Commelina* spp.* | *Grewia flava* | *Euclea natalensis* |
| *Dichrostachys cinerea* | *Grewia monticola* | *Grewia flavescens* |
| *Rhus leptodictya* | *Lannea discolor* | *Helichrysum* spp.* |
| *Rhus pyroides* | *Lippia javanica* | *Indigofera* spp.* |
| | *Maytenus heterophylla* | *Pavetta zeyheri* |
| | *Mundulea sericea* | *Peltophorum africanum* |
| | *Ochna pulchra* | *Securinega virosa* |
| | *Ozoroa paniculosa* | *Strychnos cocculoides* |
| | *Pappea capensis* | *Vitex mombassae* |
| | *Pavetta assimilis* | *Vitex rehmannii* |
| | *Strychnos pungens* | *Ziziphus mucronata* |
| | *Terminalia sericea* | |
| | *Triumfetta sonderi* | |
| | *Vangueria infausta* | |
| | *Ximenia caffra* | |
| Total = 10 (21%) | Total = 21 (44%) | Total = 17 (35%) |

The impala used in this study were removed from their natural environment at a very early age and were not exposed to the indigenous vegetation until presented with the branches. They were, therefore, totally naive as to whether the plants presented to them were palatable or not. Although their behaviour may have been influenced by the fact that they were hand-fed, they nevertheless still showed some ability to recognise and reject certain plants ignored by wild impala (*eg. Burkea africana, Peltophorum africanum*).

**Table 2** Thirteen woody plant species which were presented to the impala lambs a second time and rejected on smell alone

| | |
|---|---|
| *Carissa bispinosa* | *Securinega virosa* |
| *Dombeya rotundifolia* | *Strychnos pungens* |
| *Grewia flavescens* | *Terminalia sericea* |
| *Lannea discolor* | *Vitex rehmannii* |
| *Mundulea sericea* | *Vitex mombassae* |
| *Pappea capensis* | *Ziziphus mucronata* |
| *Peltophorum africanum* | |

Out of 16 plant species both recorded as eaten by a tame adult impala (Monro 1979) and presented to the lambs in the present study, 10 species were rejected by the lambs (among them *Grewia flavescens*, an important food plant to Monro's impala). However, it should be borne in mind that the feeding habits of Monro's tame impala may not be the same as those of wild individuals. In a similar study on the feeding habits of a young tame lesser kudu *Tragelaphus imberbis* and a gerenuk *Litocranius walleri*, it was found that they rejected some plant species known to be eaten by wild kudu and gerenuk (Leuthold 1971). Of the 54 species offered to the tame lesser kudu, at least 45 were eaten by wild individuals. The tame kudu rejected two species known to be rejected by wild kudu, but also rejected 10 other species normally eaten (among them several important food plants). The situation was similar with the gerenuk which rejected several plants commonly eaten in the wild. Leuthold (1971) concludes from his observations that specific feeding habits are formed on the basis of both an innate selecting mechanism and learning. The data from the present study support these ideas.

Some plants may be preferred more than others because of their higher nutrient content. For example Monro (1979) found that his tame impala preferred the pods of *Acacia tortilis* to those of *Acacia nilotica*, *A. tortilis* pods having twice the protein concentration of those of *A. nilotica*. From the behaviour of the young impala it appears that the selection process includes not only looking at the plant, but also the senses of smell and taste. Several of the plants offered to the lambs had a definite odour, detectable even to the human nose and these plants were usually rejected (*eg. Pavetta assimilis, Vitex mombassae, Lippia javanica*). For example, those impala that tasted certain plants that were otherwise rejected on smell by the remainder of the group, apparently learnt from the experience and rejected the plants when they were presented a second time. Leuthold (1971) suggests that young antelope may also learn from watching the feeding habits of the older members of the herd.

The feeding habits of the young impala changed as they matured. At two months of age they were released into a 1-ha camp containing indigenous vegetation. Initially they ate only the plant species they had spontaneously accepted in the pen, but in a short time began to include *Vitex rehmannii*. By the time the impala were six months old however, the trees in the camp were losing their leaves at the onset of winter and the area was showing signs of over-utilization. At this stage the impala were observed eating small quantities of *Dombeya rotundifolia, Pappea capensis, Combretum zeyheri, Mundulea sericea* and even *Peltophorum africanum* (all previously ignored species). These observations suggest that changes in food availability and quality may force young antelope to try new plants and thus increase their knowledge of food items.

In conclusion this study supports the ideas of Leuthold (1971) that feeding habits in young antelope are formed on the basis of both innate behaviour and learning; and that lambs probably learn from older members in the herd. In addition, changes in food quality and quantity may force impala to try new plants previously ignored. However, it must be emphasized that the feeding habits of hand-reared impala may not be the same as those of wild impala, but may merely be a result of the diet imposed on them by their keeper. It would be extremely valuable for future food selection studies if the differences between hand-reared and wild impala could be determined.

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# Some blood parameters of the Chinese grasscarp *Ctenopharyngodon idella* (Valenciennes)

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*Ctenopharyngodon idella* was introduced from West Germany into South Africa in 1975 as an aquatic vegetation feeder to compliment *Tiliapia rendalli* (Boulenger) which is intolerant of winter water temperatures below 12–14 °C (Schoonbee, Brandt & Bekker 1978). The former species has been successfully spawned artificially for two seasons and preliminary studies indicate that these fish can control aquatic vegetation by daily ingesting up to five times their body weight of aquatic plants (Schoonbee *et al* 1978). It is hoped that the haematological profile provided in this study may contribute to the knowledge of the physiology of the grasscarp.