VARIATION IN RELATIVE PALATABILITY OF DIFFERENT FORAGES FED TO RABBITS

OSAKWE, Isaac Ikechukwu and EKWE, Okechukwu Okorie
Department of Animal Production and Fisheries Management, Ebonyi State University, PMB 053, Abakaliki, Nigeria

Corresponding Author: Osakwe, I. I. Department of Animal Production and Fisheries Management, Ebonyi State University, PMB 053, Abakaliki, Nigeria. Email: osakwe_i@yahoo.com Phone: +3443300448; +348034910687

ABSTRACT

Twenty four 10-week old crosses of (New Zealand White X Chinchila) rabbits was used to determine relative palatability differences in leaves of Calopogonium mucunoides (Calopo), Elaeis guineensi (Oil palm), Musa sapientum (Banana) and Andropogon gayanus (Gamba). Centrosema pubescens (Centro) was included as control. Significant differences (P < 0.01) in relative palatability index (RPI) were detected among the different forages offered. Based on their RPI, rabbits preferred in descending order of magnitude Centrosema pubescens, Calopogonium mucunoides and Elaeis guineensi (RPI > 95 %) to Musa sapientum (RPI > 70 %) and Andropogon gayanus (RPI > 40 %). The preference of Oil palm leaves to Banana leaves according to the RPI ranking in this study is an interesting observation from the study.

Keywords: Forage plants, Relative palatability, Rabbit

INTRODUCTION

Rabbits have potential as meat-producing animals in the tropics, particularly on subsistence-type farms. Characteristics such as small body size (thus low daily feed requirements), short generation interval, high reproductive potential, rapid growth rate and the ability to utilize forages and fibrous agricultural by-products are attributes in favour of rabbit production (Cheeke, 1986; Cheeke *et al.,* 1987). Rabbit is also a good source of meat, which is of high quality with low cholesterol and therefore suitable for special diets (Owen, 1981). It has an advantage over poultry and pigs because it can convert locally available plant products and by-products such as *Leuceana leucocephala* (Raharjo and Cheeke, 1985) and by-product feeds (Raharjo *et al.,* 1986) into animal protein for human consumption.

It is heart warming however, to note that the ability of rabbits to subsist on forages derived from leguminous browse plants and multi-purpose trees (MPTs) has brought tremendous relief to rabbit producers. In spite of these apparent advantages, rabbit production has not yet achieved its optimum potential in the tropics.

In selecting herbage for rabbits the most important factors for consideration are: Availability of the browse, the crude protein level, the digestibility factors and toxic constituents.

The major classes of browse plants are grasses and legumes. Based on the crude protein, crude fibre and digestibility, legumes are more superior to grasses but their utilisation is seriously limited by their levels of toxic constituents. The grasses on the other hand will dry up during the dry season and thus unavailable. Within the rabbitary unit, Ebonyi State University, perennial plants such as banana and oil palm trees abound in addition to herbaceous legumes and grasses. However, during the late dry season, most of the herbaceous legumes and grasses dry up leaving the oil palm and banana leaves.

This trend has necessitated the need for a study to determine the relative palatability of *Andropogon gayanus* (gamba grass), *Musa sapientum* (banana leaves), *Calopogonium mucunoides* (calopo), and *Elaeis guineensis* (Oil palm leaves), using *Centrosema pubescens* (centro) as control fed to rabbit.

MATERIALS AND METHODS

Study Area: The study was carried out at the Rabbitary Unit, Teaching and Research Farm, Department of Animal Production and Fisheries Management, Ebonyi State University, Abakaliki. The station is located between latitude 06o 21N and longitude 08o 51E. The annual rainfall ranges from 1500 to 1800 mm with a temperature range from 21^{o} to 30^{o} C (Ofomata, 1975).

Rabbit: Twenty four ten-week old crosses of (New Zealand White X Chinchila) rabbits were introduced into the pen for five hours each day. The rabbits had been accustomed to feeding on Centrosema pubescens since weaning.

Palatability: A palatabilty study using the cafeteria method was conducted. Fresh leaves from 8-weeks early dry season regrowth of Andropogon gayanus, Calopogonium mucunoides, and leaves from matured Musa sapientum, and Elaeis guineensi were harvested and fed to rabbits. Centrosema pubescens was included as control. Leaves were harvested during the morning (08.00 - 11.00) of each collection day. Equal amounts were offered separetely in plastic feeding troughs randomly placed around the

perimeter of an 8 x 6 m roofed pen. Weights of residual material were recorded and consumption of each forage calculated. The procedure was repeated for 10 days following a five-day adjustment period. Feeding throughs were re-randomised each day. A daily relative palatability index (RPI) was calculated for each forage by dividing all consumption values by that of the highest value, and multiplying the result by 100.

Statistical Analysis: The experimental design was a split-plot with two pen replications. Analysis of Variance (ANOVA) was used to analyse the data according to the procedure outlined by Steel and Torrie (1980). Detection of differences among treatment means were carried out using the least significant difference (LSD) procedure.

RESULTS

The chemical composition of the forages has been shown in Table 1. The crude protein contents of Centro, Calopo and Elaeis were 20.8, 18.4 and 12.5 % respectively while the Banana leaves and Gamba had Crude protein contents of 12.2 and 11.8 % respectively. The organic matter as well as the crude fibre contents of the forages were also shown (Table 1).

Table 1: Proximate composition of forages (% DM basis)

	Centro	Calopo	Oil palm	Banana leaves	Gamba grass
Ash	7.0	9.8	7.0	13.0	6.0
Organic matter	93.0	90.2	93.0	87.0	94.0
Crude fibre	30.7	21.6	29.8	23.1	29.3
Ether extract	2.9	3.1	6.5	5.6	2.5
Crude protein	20.8	18.4	12.5	12.2	11.8
Nitrogen free extract	38.4	47.1	44.2	46.1	50.4

The relative palatability index (RPI) and preference ranking (PR) of the forages are shown in Table 2. Analysis of RPI data showed no significant ($P > 0.05$) forages by collection day interaction. However, significant ($P < 0.01$) differences were detected among the different forages offered when data were accordingly analysed across days. Rabbits preferred in descending order of magnitude Centrosema pubescens, Calopogonium mucunoides and Elaeis guineensi (RPI > 95 %) to Banana leaves (RPI > 70 %) and Andropogon gayanus (RPI > 40 %).

Table 2: Relative palatability index (RPI), and preference ranking (PR) of the forages

Forages	Relative palatabilty index	Preference ranking
Centrosema pubescens	100	1
Calopogonium mucunoides	98.5	2
Elaeis guineensi	97.6	3
Musa sapientum	73.2	4
Andropogon gayanus	49.2	5

The results of forage comsumption by rabbits during the ten days cafeteria feeding is shown on Figure 1. The consumption of centro, calopo and oil palm leaves were significantly ($P < 0.01$) higher than those of banana leaves and gamba grass. Banana leaves was consumed more ($P < 0.01$) than gamba grass. There were no significant ($P > 0.05$) differences in the consumption of centro, calopo and oil palm leaves

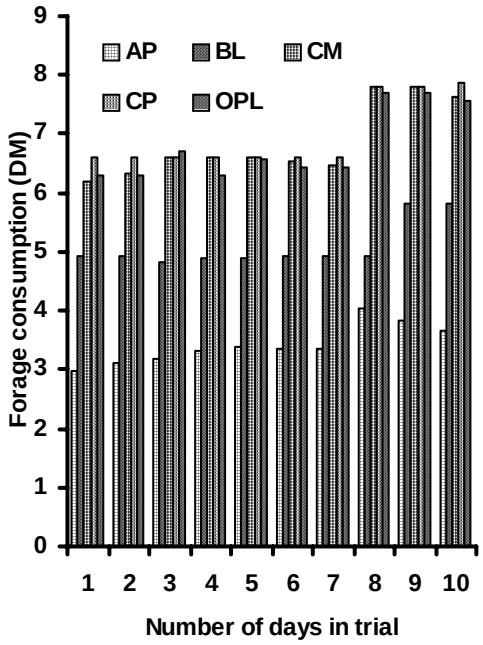

Figure 1: Forage consumption of rabbits during cafeteria feeding. Legend: AP = *Adropogon gayanus*; BL = Banana leaves; CM = *Calopogonium mucunoides*; CP = *Centrosema pubescens*; OPL = Oil palm leaves

DISCUSSION

The exact reasons for the differences in relative palatability of rabbits fed different forages is not known, and could not be explained by this study. This is because palatability is a complex phenomenon determined by dietary type and environmental variables (Marten, 1978; Molyneux and Ralph, 1992). However, it could be argued that rabbits preferred familiar and novel foods that complemented the flavours and macronutrient contents of their basal diet (Cheeke, 1986).

The relative palatability index (RPI > 95 %) observed in centro, calopo and oil palm leaves was corroborated by the high crude protein contents of 20.8, 18.4 and 12.5 % observed in this group. Differences in anti-nutritional factors (ANF) and astringent tastes in forage legumes may be partly accountable for the difference in observed RPI. A key concept in palatability explanation is aversion, the decrease in preference for food just eaten as a result of sensory input (taste, odor, texture, i.e. food's

flavour) and postingestive effects (of nutrients and toxins on chemo-, osmo-, and mechano-receptors) unique to each food (Provenza, 1995).

The crude fibre levels in the forages were in the range of 21.6 30.7 % (Table 1). According to Champe and Maurice (1983), rabbits require more than 9 % crude fibre in feed for normal growth.

The preference of oil palm leaves to banana leaves according to the RPI ranking in this study is an interesting observation. Banana plants are around the farm and its leaves usually given to rabbits as against oil palm leaves that is equally available. This observation is in agreement with the reports of Provenza (1996) who noted that aversion also occur even when nutritious food are eaten too frequently or in excess.

The decision to feed Banana leaves was made by owners of rabbits and it may interest them to try out oil palm leaves now. Further research is needed to establish anti-nutritional factors in forages using preference ranking.

Conclusion: Data from this study showed that there is a great potential for improvement in rabbit production. Our study indicated differences in relative palatability among selected forages. Identification of other palatable forages such as Musa sapientum and Oil palm leaves during dry season could stimulate interest in rabbit production.

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