

NUTRITIONAL POTENTIALS OF *IPOMEA*, *CENTROSEMA*, *PUERARIA*, *EMILIA* AND *TRIDAX* FORAGES IN MIXED FEEDS FOR WEANER RABBITS

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ABSTRACT

Five forage species *Ipomea batata*, *Centrosema pubescens*, *Pueraria phaseoloide*, *Emilia sonchifolia* and *Tridax procumbens* were evaluated for growth promotion in a mixed feeding regime comprising 50g of rabbit pellet plus forage (*ad libitum*). Thirty weaner rabbits (6 weeks old) were randomly assigned in a completely randomised design in equal groups of six rabbits (2 bucks and 4 does) to the forages during a 12-week feeding trial at the University of Calabar Livestock Research Farm. Results showed significant ($P < 0.05$) differences in mean daily forage consumption among the species with the values 247.92g (*I.batata*), 161.95 (*C. pubescens*), 167.28g (*P. phaseoloide*) 274.14g (*E.sonchifolia*), and 291.93g (*T. procumbens*). No significant ($P > 0.05$) differences were observed in the mean daily dry matter intake, the values of which ranged between 75.26 and 81.30g. While the initial body weights were not significantly different, the forages had significant effect on the final bodyweights of the rabbits with the values of 2365.20g (*Ipoemea*), 2179.74g (*Centrosema*), 1662.45g (*Pueraria*), 1862.02g (*Emilia*) and 2352.72g (*Tridax*).

Key words:- Forages, pellet, mixed feeding, growth, rabbit weaners.

INTRODUCTION

The production of rabbits as a livestock species is gaining importance in the Nigerian sub-humid zone. Ability of rabbits to thrive on forages which are abundant and available all year round in high rainfall areas, make rabbit production cheap (Aduku and Olukosi, 1990). This ability is, however, limited since fibre digestion in this monogastric herbivore is post-gastric in the caecum (Davidson and Spreadbury, 1975). Consequently, rabbits are less than one-half as efficient as cattle in

digesting dietary fibre (Slade and Hints, 1969) and the requirement for crude fibre in their diet is 14-25% (Adegbola *et al.*, 1985). Butcher *et al.* (1981) reported that consumption and digestion of crude fibre were higher in rabbits fed pelleted diet with green forage than sole green feed.

Much work has been done on feeding forage to rabbit in a mixed feeding regime (Pote *et al.*, 1980; Cheeke, 1984; Harris *et al.*, 1984; Aduku *et al.*, 1986; Dematerova, *et al.*, 1991). Harris *et al.* (1984) obtained higher body weight gain and food conversion efficiency in a mixed feeding regime of free choice hay and pellets than on sole pellet. Cheeke (1984) obtained average daily weight gain of 35.40g when green forage was fed with an average of 79.90g pellet/day. Free choice forage feeding was also found to reduce pellet intake by 50% with no adverse effect on body weight.

Generally, information on the nutritional potential of forages within the Nigerian humid environment as feedstuffs for rabbits is scanty. Such information, however, is necessary for a well planned balanced and cost effective feeding programme (Yano *et al.*, 1986). Ekpenyong (1986) identified some forages which could be fed to rabbits. Because nutrient contents of forages vary greatly by location, forage species, varieties within species and growth stages within a variety, this study was carried out to evaluate the potentials of five forage species common in the sub-humid zone.

MATERIALS AND METHOD

Five forage species, *Ipomea batata*, *Cetrosema pubescens*, *Pueraria phaseoloide*; *Emilia sonchifolia* and *Tridax procumbens*, were evaluated for growth promotion in a mixed feeding regime of forage and rabbit pellets. Thirty weaner Newzealand White

rabbits (age, 6 weeks; average weight, 622.03 ± 3.47) were allotted in equal number (2 bucks and 4 does) at random to the forages using Completely Randomized Design (CRD). There were six replicates per forage. Rabbits were first generation (F₁) offsprings of foundation stock parents obtained from National Root Crop Research Institute (NRCRI) Umudike. The rabbits were housed individually in cages 0.75m long, 0.60m wide and 0.60m high.

The fresh green forages were weighed and given to rabbits from 11.a.m. after an initial diet of 50g pellet daily. Quantities of forage consumed were obtained as differences between feed supplied and theorts. Proximate analyses of the forages and pellets were done in four replicates to determine the average nutrient composition (Table 1). Calculated energy content of the pellet was 3185 kcal Metabolizable energy/kg. Dry matter (DM) intake was obtained from the DM contents of forages and pellet (Table 2). Water was supplied *ad libitum* with salt lick placed within each cage. Body weight measurements were taken on all animals at 2 weeks interval. The study was conducted at the University of Calabar Livestock Reseach Farm (August-November, 1993).

Data collected were analysed by Analysis of Variance to test for significance of forage effects followed by Duncan's Multiple Range Test (Steel and Torrie, (1960).

RESULTS AND DISCUSSION

The chemical composition of forages and pellet are presented in Table 1. Generally, the nutrient values of the forage especially crude fibre (CF) and dry matter, varied significantly but were consistent with the observations of Aduku and Olukosi (1990). The CF content of *Centrosema* and *Pueraria* were higher than the suggested crude fibre range of 14-25% for rabbits (Adegbola *et al.*, 1985). Crude protein contents of all forages were higher than the value, 15%, required for rabbits' growth. However, the limitation of rabbits in digesting dietary fibre affects nutrient availability and subsequent utilization (Slade and Hintz, 1969).

The pellet had significantly lower crude fibre and higher dry matter contents than the forages. Forage type significantly affected live body weight at 8 weeks (Table 2). Rabbits fed *Ipomea*, *Centrosema* and *Tridax* consistently had significantly higher body weights than those fed *Pueraria* and *Emilia* (Table 3). A similar trend was observed with mean body weight gain. Average daily body weight gain ranged between 12.47g (*Pueraria*) and 20.84g (*Ipomea*). Mean daily gains on *I. batata*, *C. pubescens*, *T. procumbens* and *E. sonchifolia* fall within the range of 15-20g reported for growing rabbits within the tropics (Aduku and Olukosi, 1990). Differences in body weight and rate of gain could be attributed to difference in forage nutrient composition. Final body weights of rabbits on *Ipomea*, *Centrosema* and *Tridax* were statistically similar though numerically different. Similarly the difference between the final body weight of rabbits on *Pueraria* and *Emilia* was not significant ($P > 0.05$). *Pueraria* gave the lowest body weight at 18 weeks. Cheeke (1984) reported higher daily weight gain, 31.40g, on a mixed feeding regime of 50g pellet + green forage fed *ad libitum* than for this study. The difference could be due to differences in forage and pellet composition, among other factors. The poor performance of rabbits on *Pueraria* could be as per the forage's high content of crude fibre (Adegbola *et al.*, 1985). Result generally showed no consistent depressive effect of crude fibre on body weight. Butcher *et al.* (1981) noted increased digestion of crude fibre in rabbits fed pelleted diet.

Table 3 summarises forage and dry matter intake. Daily forage intake differed significantly; lower amount of *C. pubescens* and *P. phaseoloide* were consumed compared with *E. sonchifolia* and *T. procumbens*. The latter was the forage consumed most and was consistent with the observation of Aduku *et al.* (1986). Preference of rabbits for forage species could be attributed to the succulent nature and palatability of the forage. The high crude fibre contents of *Centrosema* and *Pueraria* appeared to depress intake of these

FORAGES IN RABBIT FEEDING

TABLE 1: PROXIMATE COMPOSITION (%) OF THE FORAGES AND PELLET FED TO WEANER RABBITS.

Forage	DM	CP	CF	EE	NFE	ASH
<i>Ipomea batata</i>	13.54	24.50	14.80	3.58	56.40	11.24
<i>Tridax procumbens</i>	10.28	24.00	22.36	3.22	41.60	8.14
<i>Centrosema pubescens</i>	22.26	22.75	28.42	2.17	44.70	6.40
<i>Emilia sonchifolia</i>	11.95	22.49	16.35	2.71	45.20	7.90
<i>Pueraria phaseoloides</i>	21.15	17.63	31.73	2.51	52.19	6.31
Rabbit pellet	90.50	17.48	4.33	8.72	58.27	11.20

TABLE 2: COMPARISON OF NUTRIENT INTAKE AND WEIGHT GAIN OF RABBITS FED DIFFERENT FORAGES (G)

Forages	Initial Weight at 6 weeks (g)	Forage (g)	Forage Dry Matter(g)	Pellet (g)	Pellet Dry Matter (g)	Pellet + Forage Dry Matter (g)	Final Body Weight (at 18wks) (g)	Average Daily Body Gain (g)
<i>Ipomea batata</i>	615.01	247.92	33.50	50	45.25	78.75	2365.20 ^a	20.84 ^a
<i>Tridax procumbens</i>	617.28	291.93	30.01	50	45.25	75.26	2352.72 ^a	20.66 ^a
<i>Centrosema pubescens</i>	637.50	161.95	36.05	50	45.25	81.30	2179.74 ^b	18.36 ^a
<i>Emilia sonchifolia</i>	625.05	274.14	32.76	50	45.25	78.01	1862.02 ^b	14.73 ^b
<i>Pueraria phaseoloides</i>	615.29	167.28	35.38	50	45.25	80.63	1662.45 ^b	12.47 ^b

a,b. Column mean with same superscripts are not significantly different (P > 0.05).

TABLE 3: COMPARISON OF BODY WEIGHT AND GAINS (g) OF RABBITS FED DIFFERENT FORAGES.

Age (weeks)	Parameters	<i>Ipomoea batata</i>	<i>Tridax procumbens</i>	<i>Centrosema pubescens</i>	<i>Emilia sonchifolia</i>	<i>Eragrostis pluviale</i>
6	Body weight	615.01	617.28	637.50	625.05	615.29
8	Body weight	856.51	830.36	830.72	787.03	746.33
	Weight gain	241.50	213.08	193.22	164.98	131.04
10	Body weight	1137.21	1082.08	1058.49	965.95	901.06
	Weight gain	280.70	251.72	227.77	178.92	154.73
12	Body weight	1440.73	1377.90	1311.75	1185.19	1071.92
	Weight gain	303.52	295.82	253.26	219.24	170.91
14	Body weight	1770.43	1702.35	1588.39	1440.69	1272.45
	Weight gain	329.70	324.45	276.64	255.50	200.48
16	Body weight	2107.15	2042.27	1896.11	1713.83	1497.99
	Weight gain	336.72	339.92	307.72	273.14	225.54
18	Body weight	2365.20 ^a	2352.72 ^a	2179.74 ^a	1862.02 ^b	1662.45 ^b
	Weight gain	258.05	310.45	283.63	148.38	164.46
	Average daily					
	Body weight gain	20.84 ^a	20.66 ^a	18.36 ^a	14.73 ^b	12.47 ^b

a, b. Row means with different superscripts are significantly different ($P < 0.05$).

forages similar to the observation by Adegbola and Osuji (1985) but the trend was not consistent especially with *Tridax* which had the lowest dry matter content. No significant differences were detected in forage and average daily DM requirement which they eat to satisfy. Average daily dry matter intake for the period across all forages was 78.79g.

Results from this study indicate that *Ipomea*, *Tridax* and *Centrosema* were nutritionally adequate for growth of weaner rabbits under humid conditions. It could be concluded that these species have higher potentials for use as rabbit feeds than *Pueraria* and *Emilia*.

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