

PERFORMANCE OF RABBIT FED HAUSA POTATO TUBER (*Solenostemon rotundifolium*) MEAL (HPTM) AT GRADED LEVELS AS SUBSTITUTE TO MAIZE

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ABSTRACT

Twenty-four (24) crossbred (New Zealand Red X Chinchilla) rabbit aged 4 – 6 weeks made up of mixed sexes with average initial body weight of (1.82kg and 1.83kg) were used to evaluate the effect of different levels of Hausa potato tuber meal (HPTM) inclusion on their feed intake and growth performance. The rabbits were randomly allotted to four groups of six rabbits per group. Each group was replicated three times in a completely randomized design with each replicate having two (2) rabbits. The groups were fed diets containing 0%, 10%, 20% and 30% HPTM respectively and designated treatment I, II, III and IV respectively. The chemical composition of the test ingredient was determined prior to its inclusion in the diets. Data were collected on final body weight, average daily weight gain and feed conversion ratio. All data were subjected to one way analysis of variance. There were no significant ($P>0.05$) difference in the above listed parameters. Rabbits fed diets III and IV is significantly ($P<0.05$) higher than rabbits fed diets II in average daily feed intake, while rabbits fed diets I were statistically similar to those fed diets III and IV. The results suggest that 30% replacement of maize with Hausa potato tuber meal (HPTM) did not have any deleterious effects on the growth performance of rabbits and that the general trend showed that there was increase in growth of the experimental animal with increase in the level of Hausa potato tubers meal (HPTM).

Keywords: *Solenostemon rotundifolium* meal, growth performance, crossbred rabbit.

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INTRODUCTION

Protein consumption in Nigeria is below 67g recommended by the World Health Organization (Akintola *et al.*, 1999). There is therefore the need to increase the protein intake to a level which compares to that of the developed nations (Okereke *et al.*, 2005). Rabbit production is being encouraged in Nigeria as a means of improving the daily protein intake of individuals (Ekpenyong and Biobaku, 1986). Exotic rabbits are assuming greater importance in an effort to bridge the supply-demand gap of animal protein in Nigeria. The extent to which such efforts succeed will depend on how well local resources can be utilized to ensure optimum performances (Ukachukwu, 1997).

Hausa potato is one of the “minor” or “lesser” known root and tuber crops whose economic usage has been overtaken by the exotic or improved ones (Olojede *et al.*, 2005). It is popular in a few places such as the Jos Plateau in Nigeria, where it is called *Tumuku*. It is also popular

in Burkinafaso, Western Sudan and Northern Ghana where it is known by different names in local languages. In South Africa, it is cultivated as a dry land crop where it is known as the Zulu round potato. Other names include Sudan potato, Kaffin potato, Coleus potato, Frafra potato and Fabourama. It is a crop rich in carbohydrates. Hence, exploitation of this energy rich crop in rabbit nutrition as a way of reducing the production cost of rabbits in Nigeria becomes imperative.

The objective of this study therefore was to evaluate growth performance of rabbit at different levels of replacement of maize with Hausa potato tuber meal in the diet of rabbits.

MATERIALS AND METHODS

The experiment was carried out at the Rabbitary Unit of National Root Crops Research Institute (NRCRI), Umudike, Abia state, Nigeria. Umudike is located on Latitude 5⁰29' North and Longitude 7⁰32' East in the rainforest zone of Nigeria. The climate of the region is characterized by a daily temperature range of 27⁰C and 35⁰C throughout the year and on average rainfall of 2000mm per annum. The relative humidity during rainy season is well above 72%.

The Hausa potato tubers used for this study were harvested from the Experimental Farm of NRCRI, Umudike. The Hausa potatoes were washed, chipped and sun-dried for 5 days to constant moisture content. The dry chips were milled and bagged for the experiment.

The diets were formulated using the Hausa potato tubers meal (HPTM) to replace maize at 0%, 10%, 20% and 30% and designated as diets I, II, III and IV respectively. Twenty four (24) weaner rabbits, 4-6 weeks old of mixed sexes (New Zealand Red X Chinchilla Cross Breed) were divided into four groups of six rabbits on weight equalization basis and assigned to each experimental diet. Rabbits were housed in pairs in wood/wire mesh hutches partitioned into individual cages, measuring 60x60x65cm and raised 50cm from the ground. They were given vitamins, coccidiostat and later dewormed before the commencement of the experiment. The experimental diets were allocated in completely randomized design (CRD). The experiment lasted for 56 days with feed and water served *ad libitum*. Rabbits were weighed with scale at the beginning of the experiment, and thereafter on weekly basis while feed offered and left over were kept daily to estimate feed consumption.

PROXIMATE AND STATISTICAL ANALYSIS

The test ingredient was analyzed for proximate composition using AOAC (1990). All results were subjected to one-way analysis of variance (Steel and Torrie, 1980), while significant means were separated using Duncan's multiple range test (DMRT)

RESULTS AND DISCUSSION

The proximate composition of Hausa potato (*Solenostemon rotundifolium*) meal (Table 2) showed that moisture content (7.4%), crude protein (7.5%), crude fibre (10.50%), ether extract (0.20%), Ash (5.98%) and NFE (68.8%) are comparable to those of (Olojede *et al.*, *Journal of the Faculty of Agriculture and Veterinary Medicine, Imo State University Owerri* website: www.ajol.info)

2005). Rabbits fed diets III and IV were significantly ($P<0.05$) higher than rabbits fed diets II in average daily feed intake, while rabbits fed diets I are statistically similar to those fed diets III and IV. The general trend shows increasing intake as the Hausa potato tubers meal (HPTM) inclusion increases. This trend may not be unconnected with energy levels of the diets since feed consumption is a function of dietary energy content (National Research Council, 1984). It is apparent that rabbits fed diets III and IV ate more feed to cater for the lower dietary energy. Furthermore, Table 3 showed that as Hausa potato tuber meal increased in the diet, caloric value of the diet decreased. More so, the result also was in agreement with the findings of Stanford (1986) and Jenson (2001) that growing rabbits adjusted their feed consumption according to energy and crude fibre content of the feed provided. The overall performance of rabbits fed various levels of meals in which Hausa potato substituted maize at 10%, 20% and 30% showed that there were no significant differences ($P<0.05$) in final body weight, average daily weight gain and feed conversion ratio among the treatments. Although there were no significant differences in final weight, the general trend showed that there was increase in growth of the experimental animal with increase in the level of Hausa potato tubers meal (HPTM). This suggests that Hausa potato tubers meal (HPTM) can be included in the rabbit diet up to 30% without any adverse effect on performance, provided that the energy and protein component of the feed was properly balanced.

Decreasing feed production cost (₦/kg) (69.04, 66.31, 63.73 and 61.39 naira) was observed as inclusion level of Hausa potato tubers meal (HPTM) increased from 0 to 30%. In areas where the economics of production favours the production of Hausa potato tubers more than maize, Hausa potato tubers meal can be used to substitute maize for the carbohydrate (Energy) needs of rabbits.

CONCLUSION

The results suggest that 30% replacement of maize with Hausa potato meal did not have any deleterious effects on the growth performance of rabbits. In the next trial, higher levels of Hausa potato tubers meal (HPTM) will be included to determine the optimum substitution level. Feed production cost decreases with increase in level of Hausa potato tubers meal (HPTM) in the diet. Areas which have economic of production of Hausa potato tubers meal (HPTM) over maize should use up to 30% in rabbit diet.

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TABLE 1: Composition of Experimental Diets.

Ingredients	0%(Diet I)	10%(Diet II)	20%(Diet III)	30%(Diet IV)
Maize	49.60	38.82	28.03	17.25
Hausa potato tuber meal (HPTM)	-	10.00	20.00	30.00
Soybean meal	8.90	9.68	10.47	11.25
Groundnut care	6.00	6.00	6.00	6.00
Fish meal	2.00	2.00	2.00	2.00
Palm kernel meal	20.00	20.00	20.00	20.00
Bone meal	3.00	3.00	3.00	3.00
Common salt	0.25	0.25	0.25	0.25
Vitamin premix	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Calculated value				
ME Kcal/kg	2781.16	2755.49	2729.75	2704.08
CP%	18.00	18.00	18.00	18.00
CF%	5.32	6.18	7.03	7.90

Table 2: Proximate Composition of test ingredient

<u>Composition g/100/gdm</u>	<u>Hausa potato</u>
Moisture	7.40
Crude protein	7.50
Crude fibre	10.50
Lipids/fat	0.20
Total Ash	5.98
NFE	68.87
Ca	0.33
Ph	0.36

Table 3: Performance of rabbit fed Hausa potato based diet

Parameters	I	II	III	IV	SEM
Initial Body weight (kg)	1.83	1.83	1.82	1.82	0.05
Final Body weight kg	3.60	3.52	3.40	3.59	0.11
Average daily weight gain (kg)	0.03	0.03	0.03	0.03	0.002
Average Daily feed intake (g)	104.90 ^{ab}	102.83 ^b	106.94 ^a	107.57 ^a	3.48
Feed conversion ratio	0.30	0.28	0.27	0.30	0.02
Cost of feed production(N/kg)	69.04	66.31	63.73	61.39	-

SEM: Standard error of mean

^{ab} means on the same row not having the same superscript are statistically different from each other (P<0.05).