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Effect of Sweet Potato (*Pomoea batatas* Lam.) Peel Meal as Replacement of Maize on Growth Performance and Cost of Feeding Weaner Rabbits

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ABSTRACT
The experiment was carried out to determine the effect of replacing maize with sweet potatopeel meal (SPPM) on growth performance and cost of feeding weaner rabbits. A total number of thirty six (36) weaned rabbit of mixed sexes were used for the experiment. The rabbits were allotted randomly into four dietary treatments and replicated thrice and were designated: control (T_1): normal compounded diet without SPPM, (T_2) contain 5% SPPM, (T_3) contain10% SPPM(T_4) contains 15% SPPM. The experiment lasted for eight weeks and data were obtained on growth performance and cost feeding. The results obtained on growth performance showed that there were no significant difference ($p>0.05$) in the values of growth performance obtained. Result obtained on cost of feeding were not significantly different ($p>0.05$) in values, however, higher profit index was recorded ion T_4 and lowest in T_1. This indicates that SPPM can be used up to 15% in the diet of rabbit as a good replacement for maize in rabbit production without any adverse effect on the performance of rabbit.

Keywords: Growing rabbit, economic efficiency, performance, sweet potato

Introduction

The expanding interest in livestock products due to quick development in the world economics and stinking area, subsequent hope for protecting their security will rely upon the better usage of non-conventional feed resources that does not compete with human food (Ayoola and Akinban, 2011). In many nations, replacing of conventional feed which appears to be expensive with the non- conventional ones seems to occupy the interest of animal nutritionist. The main reason for finding an alternative to the conventional feeding stuffs is to reduce the cost of production thereby leading to a reduction in price of animal protein making it affordable by most people (Ojebiye *et al., l*2006). Yam, sweet potato, and Irish potato peel have been distinguished as a good alternative energy source feedstuffs that can be utilized in both poultry and livestock feed (Adeyemo and Borries, 2002). These alternative feeding stuffs described as non-conventional feeds are essential to farming systems that produces both livestock and crops (Henning *et al.,* 2006). Crop by-product are abundant in Nigeria but are not yet to be effectively utilized by livestock producers as a potential feeding stuffs (Ayuk *et al.,* 2011).

The experiment was carried out to determine the effect of replacing maize with sweet potatopeel meal on growth performance and cost of feeding weaner rabbits.

MATERIAL AND METHODS

The research work was carried out at the Rabbit Section of the Teaching and Research Farm of Ibrahim Badamasi Babangida, Lapai, Niger state. Lapai is very close to Minna which is the state capital and lies between latitude Lapai lie between latitude, east of the equator (Usman, 2011).The thirty six weaned rabbits of mixed sexes and breeds were obtained from Sultan Veterinary Consult farm Samaru Zaria, Kaduna state. The sweet potatoes peel were collected from the surrounding environment in Lapai metropolis in Lapai Local Government Area of Niger state, Nigeria, groundnut cake (GNC), bone meal (BM), limestone, premix, methionine and lysine, maize, maize offal, rice offal, soybean meal, fish meal, and salt were procured Thirty six weaned mixed breeds and sexes rabbits, age between 5-6weeks were randomly allotted to four treatment groups with nine rabbits per treatment. Each treatment had three replicates of three rabbits per replicate.

Four experimental diets (Table 1) were formulated with crude protein set at 18% for each diet designated as T2, T3, and T4 respectively with sweet potato peel meal inclusion at 5, 10 and 15% respectively. The rabbits were giving Ivomecatin injection against parasites. Vitacox-plus and Neo-furaseryl-plus were adequately given as well. The cages were well clean, disinfected with Dettol and equipped with drinkers and feeders. Prior to the experiment, the animals were feed the control diet and allowed the adjustment period of one week to enable the animals get used to their various cages and diets. The fresh clean waterwas provided ad-libitum. The experiment lasted for 8 weeks.The following parameters were measured on the feeding trial: Daily feed intake, Feed conversion ratio. The prevailing market prices of ingredients used during the period of the experiment were used for the economics appraised of the feed. Economics production was based on the feed cost per kg diet, to confirm if the use of the test ingredient (sweet potato peel meal) has any economics benefit to the end users.

The data generated were subjected to Analysis of Variance (ANOVA) using statistical package (SAS, 1998). The mean were separated using Duncan Multiple Range Test (DMRT) as described by Duncan (1955).

Table 1: Composition of experimental diets

	T_1	T_2	T_3	T_4
Ingredients	0%	5%	10%	15%
Maize	42.00	38.00	36.00	34.00
Sweet potatoes peel	0.00	4.00	6.00	8.00
Maize offal	25.00	25.00	25.00	25.00
Soybeans meal	2.00	2.00	2.00	2.00
Fish meal	1.20	1.20	1.20	1.20
Groundnut cake	10.00	10.00	10.00	10.00
Limestone	1.00	1.00	1.00	1.00
Bone meal	2.00	2.00	2.00	2.00
Salt	0.20	0.20	0.20	0.20
Premix	0.30	0.30	0.30	0.30
Methionine	0.20	0.20	0.20	0.20
Lysine	0.10	0.10	0.10	0.10
Total	100	100	100	100

Results and Discussion

The result of proximate composition of the experimental diet as presented in table 2 showed highest crude protein (29.75 %) on T4treatment4and loweston T1 treatment (21.87%). Fat content was higher on T2 treatment than other treatments and the least percentage fat is obtained in T4 (12.64 %). Highest percentage crude fiber was obtained on T4 (4.05 %) and the least on T1 (3.20). The results of this study were in line with the works of Oyenuga (1968).Growth performance results (Table 3) shows that there were no significant differences ($p>0.05$) across the treatment groups. This is in contrast with the findings of Taiwo *et al.* (2005) and Akinmutimi *et al*. (2008) where significant difference were observed in the initial weight, total weight, final weight, daily feed intake, weekly feed intake, daily weight gain, total feed intake and feed conversion ratio of weaner rabbits when were fed with sweet potato and yam peel meal.

The costs of feeding of feeding rabbit with graded level of sweet potato peel meal are presented in table 4. Treatment one had the highest cost of feed per kg(16.01%) while treatment three had the lowest value (15.03). The total cost of feed intake / rabbit tent tobe lower in treatment three while treatment one had the highest cost of feed per rabbit. Cost of feed per gram tend to be lower in treatment four (51.00) and higher in treatment one, two and three.

Table 2: Proximate composition of experimental diets.

Parameter	T1	T2	T3	T4
Dry matter	93.12	93.70	93.36	93.19
Ether extract	12.90	13.68	13.40	12.64
Ash	11.91	14.50	14.75	14.87
Crude fiber	3.20	3.86	3.94	4.05
Crude Protein	21.87	23.62	26.25	29.75
Nitrogen Free extract	43.24	38.04	35.02	31.02

Table3: Growth performance of rabbit fed with graded level of sweet potato peel meal

Parameters	T1	T2	T3	T4	LSD	LS
Initial weight	667.78	744.44	700.00	761.11	127.16	NS
Final weight	877.20	965.60	902.80	1085.60	311.08	NS
Total weight	209.45	221.11	202.78	324.45	208.14	NS
Daily weight gain	98.12	3.95	3.62	5.79	153.22	NS
Weekly weight gain	29.94	31.60	28.96	46.35	29.72	NS
Daily feed intake	194.76	196.00	196.13	195.94	5.16	NS
Total feed intake	10906.40	10808.00	10983.10	10972.50	305.54	NS
Feed conversion ratio	12.62	11.33	12.53	10.35	3.96	NS

T1= treatment one, T2= treatment two, T3= treatment three, T4=treatment four, NS= not significant, LSD= least significant difference, LS Level of significant,

Table 4: Cost of feeding rabbit with graded levels of sweet potato peel meal

Parameter	T1	T2	T3	T4
Cost of feed/kg 16.01	15.86	15.03	15.21	
Total feed intake/rabbit	10906.40	10808.00	10983.10	10972.50
Total cost of feed intake/rabbit	174.61	171.41	165.02	166.88
Total weight gain	209.45	221.11	202.78	166.88
Cost of feed per (kg)	83.00	77.00	81.00	51.00

T1= treatment one, T2= treatment two, T3= treatment three, T4=treatment four.

Conclusion

The results of these studies show that 15 % inclusion level of sweet potato peel meal in the rabbit's diet gave better performance without any harmful effects.The use of sweet potato peel meal in the diet of rabbit is recommended at 15 % inclusion level

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