

REPLACEMENT VALUE OF GROUNDNUT HUSK FOR MAIZE IN RABBITS DIETS

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ABSTRACT

An experiment was conducted to evaluate the replacement value of groundnut husk for maize in rabbit diets. Groundnut husk was used at 0, 10, 15 and 20% levels to replace maize as diets 1, 2, 3 and 4 respectively. A total of sixteen rabbits of mixed breed and sex were obtained from Muda Lawan market Bauchi and allotted to four dietary treatments in a completely randomized design (CRD), and the feeding trail lasted for eight weeks. Daily feed intake ($P < 0.001$) 38.70-46.30g and daily weight gain 4.6-10.50g ($P < 0.05$) were affected significantly by the dietary treatments, however feed conversion ratio (4.01-3.15) was not affected significantly. The feed cost in naira per kilogram gain was relatively higher on maize (control diet) and lower on groundnut husk based diets. It can be concluded that groundnut husk can substitute maize up to 20% level of inclusion in the diets of rabbits without any adverse effect on performance.

Key words: Rabbits, Diets, Groundnut husk, Maize and Performance.

INTRODUCTION

The potential of rabbit meat as a quality or nutritious food resulted from its higher protein content, lower fat, lower sodium and cholesterol content compared to other meat sources such as beef, pork, mutton and chicken. Protein deficiency in some part of the world has reached an alarming state. It is a fact that there is an inadequate intake of animal protein in Nigeria (Ayayi *et al.*, 2007). To erase this problem of low animal protein intake, there should be an expansion in the production of small highly prolific livestock with rapid turnover rate at a very low cost. Rabbits are small mammals in the family leporidae of the order lagomorpha found in many different continent and climatic zones. The prolific nature of rabbits coupled with its short gestation period and generation interval makes it the animal of choice for multiplication and a short way of increasing animal protein intake (Akinmutimi *et al.*, 2008). Rabbit production in Nigeria is gaining much popularity but it is contravened by the high cost of conventional feed stuffs which producers cannot afford. Feed is one of the constraints to intensive rabbit production in Nigeria due to competition between man, industries and animals for conventional feed materials. This has led to the escalating cost of conventional ingredients and has made feed cost to account for about 70% of total cost of production (Akinmutimi, 2008). This problem has been the major stimulant for the search for alternative feed stuffs that can meet the nutritional requirement of micro-livestock, reduce the cost of feed and animal production (Oloredeet, 2011). The alternative feed material should be one that has low human food preference and of low industrial usage. Groundnut husk is the cover that is left after the fleshy groundnut seed is removed. The groundnut husk has some nutritive value and may be useful to rabbits as source of fiber (Aduku and Olukosi, 1992). There is no sufficient literature on the use of groundnut husk as feed by rabbits. Therefore, the present study will test the effect of replacing maize with groundnut husk in the diets of rabbits and to find out the economic efficiency of using groundnut husk in rabbit production.

Materials and Method

Experimental Site

The experiment was conducted at College of Agriculture farm Bauchi, Bauchi State. Bauchi is located within the Northern Guinea Savanah on latitude $10^{\circ} 17' N$ and $9^{\circ} 49' E$ at altitude 690.2m above sea level (FAO, 1999). The mean annual rain fall ranges between 600mm in the north and 1300mm in the south. Bauchi has mean annual maximum and minimum indoor temperature of 32 to 41 respectively with a relative humidity of 20.00 and 67.00% respectively

Experimental Animals and their Management

A total of sixteen weaned rabbits of mixed breed and sexes were used for the study. The rabbits were between the ages of 6-7 weeks. The experimental animals were randomly distributed to four (4) dietary treatments and each treatment was replicated two (2) times and the trial lasted for eight weeks.

The rabbit's house was cleaned and disinfected before the beginning of the experiment, similarly; the cage, plastic drinker and feed containers were thoroughly washed and disinfected. The rabbits were gradually introduced to the experimental diets. Routine management was carry out on daily basis such as cleaning the cage, supplying feed and fresh water.

Experimental Diets

Four (4) diets were compounded with; 0, 10, 15 and 20% replacement levels of groundnut husk, coded as diets T1, T2, T3 and T4 respectively.

Data Collection and Statistical Analysis

Rabbits were bought from market and weighed at the beginning of the experiment after preliminary period of one week to determine the initial weight of the rabbits. Subsequently the rabbits were weighed weekly to determine the body weight changes. Feed intake was obtained by subtracting the leftover from the initial feed given which is on daily basis. Data collected was subjected to analysis of variance statistical package for social sciences and significant differences in treatment means were separated using LSD.

Results and Discussion

Performance of Rabbits

There was no significant difference ($p < 0.05$) on the initial weight of the experimental rabbits this shows that all the rabbits have similar weight. There was no significant difference ($p < 0.05$) on the final weight gain and feed conversion ratio. However there was significant difference ($p < 0.001$) on the total feed intake. Rabbit on diet 3, consumed 5187g more feed compare to those on diet 1, with feed consumption of 4289g. This possibly was because of the level of crude protein present in the diet make the feed more palatable. Also there was highly significant difference ($p < 0.001$) on the average daily feed intake. Rabbits on diet 3, consumed 47.20g per day while rabbits on diet 1, consumed 38.70g per day. This may be as a result of higher level of forage in diet 3, because rabbits can be reared solely on forages as reported by Omole, (1992) that the basal diet for rabbits is forages but supplementation with concentrate improves the performance of the rabbits. There was significant difference ($p < 0.05$) on the average daily weight gain. Rabbit on diet 4 have the highest average weight gain of 10.50g, followed by rabbits on diet 3, 2 and 1 with weights of 6.60g, 6.40g and 4.60g respectively. This finding agrees with the study of Iyeghe-Erakpotobor and Adeyegun, (2012) they reported that weight gain of rabbits increased with increase in groundnut forage meal level. The economic analysis shows that, feed cost in naira per kilogram gain seemed to be comparatively higher on maize (control diet) than the groundnut husk based diets, this trend was expected as the price of maize was higher than groundnut husk which price amount close to little or nothing and could economically replace maize. The feed cost ₦/kg gain at 20% level of inclusion of groundnut husk diet is cheaper and requires ₦260 worth of feed to provide 1kg body weight gain compare to control diet that requires ₦618.7 to produce 1kg body weight gain.

Conclusion

It can be concluded based on the results obtained, that groundnut husk could replace maize up to 20% level of inclusion without any detrimental effect on performance. The 20% level of inclusion is economically cheaper and could give a cost saving of 358.7 from each kg of feed used compare to the control diet.

The percentage composition of the experimental diets will be shown in table 1 below

Table 1: Percentage Composition of the Experimental diets fed to rabbits

Diet%				
Ingredient	T1(0)	T2(10)	T3(15)	T4(20)
Maize	34.62	31.16	29.43	27.69
G/husk	0.00	3.46	5.19	6.92
Full fat soya	13.38	13.38	13.38	13.38
Wheat offal	48.80	48.80	48.80	48.80
Fishmeal	1.50	1.50	1.50	1.50
Bone meal	1.00	1.00	1.00	1.00
Premix	0.25	0.25	0.25	0.25
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
Salt	0.25	0.25	0.25	0.25
	100%	100%	100%	100%

Calculated Analysis

Crude Protein	17.97	17.86	17.80	17.75
Crude Fibre %	9.71	11.75	13.26	13.77
ME(kcal/g)	2462	2434	2420	2407

Performance of Rabbits Fed varying levels of groundnut husk (1-8 weeks)**Table 2: performance of rabbits fed varying levels of groundnut husk**

Parameters	T ₁	T ₂	T ₃	T ₄	SEM	LOS
Initial weight(g)	1500	1300	950	1050	18.00	NS
Final weight(g)	2020	2020	1595	2245	6.00	NS
Average daily weight gain(g)	4.60 ^b	6.40 ^a	6.60 ^a	10.50 ^a	0.35	*
Average daily feed intake(g)	38.70 ^b	44.30 ^a	47.20 ^a	46.30 ^{ab}	0.30	* * *
Total feed intake(g)	4289.00	4968.00	5288.00	5187.00	14.40	* * *
Feed conversion ratio	4.01	3.35	3.40	3.15	0.27	NS
Mortality	0.00	0.00	0.00	0.00	0.00	0.00

SEM = standard error of mean, NS = not significant , * * * = significant (p<0.001),

* = significant (p<0.05), LOS = Level of significance

Table 3: Economics of rabbit production using groundnut husk based diets

Parameter	Diet %			
	T ₁	T ₂	T ₃	T ₄
Total feed intake(kg)	4.29	4.97	5.29	5.19
Feed cost(₦/kg)	75.00	67.50	63.00	59.90
Total feed cost(₦)	321.20	335.40	333.00	310.00
Total weight gain(kg)	0.52	0.72	0.64	1.19
Feed cost ₦/kg gain	618.70	465.80	520.00	260.00
Cost Saving	—	152.90	98.70	358.70

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