

## **GROWTH PERFORMANCE, CARCASS CHARACTERISTICS AND VISCERAL ORGAN WEIGHTS OF RABBIT DOES FED YAM PEEL MEAL AS A REPLACEMENT FOR MAIZE**

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### **ABSTRACT**

*The study was aimed at evaluating the effect of replacing maize with yam peel meal (YPM) on the growth performance, carcass characteristics and visceral organ weights of rabbit does. The experiment was conducted at the Rabbitry unit, Livestock Teaching and Research Farm, Joseph Sarwuan Tarka University, Makurdi. A total of twenty-four (24), seven (7) weeks old female rabbits were used for this study which lasted a period of 56 days. The rabbits were grouped into four (4) according to Four (4) treatments. The rabbits were grouped into four (4) treatments, each treatment replicated into six (6) with each replicate containing one (1) rabbit. The rabbits were given water and feed ad - libitum. The data collected were initial body weight, weekly body weight, feed intake, water intake, carcass weight and weights of visceral organs. The data collected were subjected to One Way Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS) software. The result showed no significant ( $P>0.05$ ) differences among all the parameters measured. The result of the study indicates that yam peel meal can be used successfully to replace maize up to 75% in conventional rabbit feeds without any deleterious effect on the growth performance, carcass characteristics and visceral organ weights of growing rabbit does.*

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### **INTRODUCTION**

The rabbit industry is growing in many countries today hence feeding problems associated with poultry and pig farming are now being encountered by rabbit breeders who depend solely on pellets and concentrates for their animal feeds (Ayoola and Akinbani, 2011). The escalating prices of pellets and concentrates for feeding rabbits in Nigeria constitute considerable constraints on the expansion of commercial rabbit production (Ayoola and Akinbani, 2011). Thus, there has been increasing research effort focused on the utilization of alternative cheap feed sources (Awosanya *et al.*, 1999). Tewe (1998) observed that under the prevailing circumstances, it is unlikely that there will be surplus from conventional cereals and pulses upon which livestock production can develop. He therefore suggested the “waste-to-wealth” approach of directing efforts towards harnessing and utilizing by-products and wastes which are not directly being utilized by man as the most logical step. While a lot of materials have already been investigated for example cocoa husk (Oyelaja *et al.*, 1970), rice bran (Tegbe *et al.*, 1984), mango seed kernel (Fayeye, 1994) and cassava peel (Olagunju 2001), there is a dearth of information on utilization of yam peel in rabbit diet. The current global food insecurity is worsened not only by the increased population growth in developing countries which has resulted in high demand for food particularly “meat” but the recent use of agricultural products mainly cereals by many of the advanced countries in the production of bio-fuel and bio-diesel (Chakraborty, 2008; Holt-Gimenez and Peabody, 2008). However, for livestock sector of any agricultural economy to be sustained amidst acute food shortage so as to boost animal protein intake worldwide, we must look for alternatives to cereals which are indigenous to our tropical environment. Among such alternatives are yam peels. Yam peels are readily available at little or no cost in our immediate environment (Ayoola and Akinbani, 2011). Rabbit production which is a low capital-intensive enterprise and can be started on small scale with very little space has the ability to convert forage and agro by-products into meat more efficiently than ruminants (Aduku and Olukosi, 1990). Moreover, they breed all year-round and have short generation interval thereby enhancing profit for poor farmers while providing animal protein for developing countries, where grains can only be justified for human use (Iribeck, 2001).

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Yam peels as described by Akinmutimi and Anakebe, (2008) contain 12.70% CP, 6.30% CF and gross energy Kcal/g of 2.98.

## MATERIALS AND METHODS

**Experimental Site:** The study was carried out at the Rabbitry Unit, Livestock Teaching and Research Farm, Joseph Sarwuan Tarka University, Makurdi, Benue State of Nigeria. Makurdi is located at longitude 8° 31' 17.00"E and latitude 7° 44' 1.50"N. It lies within the middle in the Guinea Savannah region of the Nigeria. The area is warm with a temperature range of 29.8-35.6°C. Rainfall is between 508 – 1016 mm and relative humidity is 44% - 86% (NIMET, 2011). Makurdi experiences two distinct seasons (i.e. wet and dry). The dry season begins in November and ends in March while the wet season starts in April and ends in October. Harmattan with cool weather is experienced from December to early February (NIMET, 2011).

**Experimental Rabbits and Management:** A total of twenty-four (24), 7 weeks old rabbit Does were purchased from Makurdi. On arrival, the rabbits were dewormed using Ivermectin at the dosage of 0.2ml (per each rabbit) injected subcutaneously. They were also given Piperazine orally for 3 days for deworming and Embazin forte orally for two (2) days to guide against coccidiosis. The rabbits were reared in intensive rabbit hutches, randomly assigned into 4 experimental treatments designated as T1, T2, T3 and T4 with each treatment replicated six (6) times and each replicate containing one rabbit. The animals were weighed to obtain their initial body weights. Clean drinking water and experimental diets were given ad libitum throughout the period of the experiment. Feeders and drinkers were cleaned on a daily basis throughout the period of the experiment.

**Preparation of Yam Peel Meal (YPM):** Yam peels were collected fresh from kitchens and roadside restaurants in Makurdi. The peels were dehydrated by shade drying in an open-air environment for 14 days to stop enzymatic and microbial reactions leading to spoilage and nutrient leaching. The dry peels were then milled in a hammer mill before incorporating into the test diets.

**Experimental Diets:** Four experimental diets were formulated such that Yam Peel Meal (YPM) replaced the test diet. T1 (0% YPM) had no yam peel meal, while the test ingredient, yam peel meal (YPM) replaced maize at 25%, 50% and 75% in the T2, T3 and T4 respectively.

Table 1: Gross composition of the experimental diets.

Ingredients	T1(0% YPM)	T2(25%YPM)	T3(50%YPM)	T4(75%YPM)
Maize	29.00	21.75	14.50	7.25
Yam Peel Meal	0.00	7.25	14.50	21.75
Brewers Dried Grains	15.00	15.00	15.00	15.00
Soya Bean Meal	13.00	13.00	13.00	13.00
Palm Kernel Cake	38.00	38.00	38.00	38.00
Bone meal	3.85	3.85	3.85	3.85
Methionine	0.27	0.27	0.27	0.27
Lysine	0.38	0.38	0.38	0.38
Vit-min Premix	0.25	0.25	0.25	0.25
Common salt	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00

**Parameters Measured:** The data collected were initial body weight, weekly body weight, feed intake, water intake, carcass weight and weights of visceral organs.

**Data Analysis:** Data collected were subjected to Analysis of Variance (ANOVA) for completely randomized design using Statistical Package for Social Sciences (SPSS).

## RESULTS

The effect of Replacing Maize with Yam Peel Meal (YPM) on the Growth Performance of Rabbit does is as shown in Table 2. Values for IBW and FBW ranged from 1359.33-1521.00 and 1712.33-1786.33 respectively and were not significant. The no significant difference ( $P>0.05$ ) in IBW shows that the initial weights of animals used could not be a source of variation to the experiment. The no

significant difference ( $P>0.05$ ) in DFI and TFI showed that, the inclusion of Yam Peel Meal did not influence feed consumption in rabbits. This result is

**Table 2: Effect of Replacing Maize with Yam Peel Meal (YPM) on the Growth Performance of Rabbit does**

Parameters	T1(0%)	T2(25%)	T3(50%)	T4(75%)	SEM	P-value	LS
IBW	1521.00	1359.33	1430.67	1376.67	32.177	0.306	NS
FBW	1786.33	1712.33	1766.67	1716.33	33.204	0.624	NS
TBWG	265.33	353.00	336.00	339.67	23.183	0.601	NS
DBWG	4.74	6.30	6.00	6.07	0.414	0.601	NS
TFI	3680.33	3884.67	4053.67	4158.33	110.84	0.503	NS
DFI	65.72	69.37	72.39	75.26	1.979	0.503	NS
FCR	14.22	11.11	13.49	12.27	0.810	0.608	NS

NS= Not Significant, SEM= Standard Error of Mean, P-v= Probability Value, IBW= Initial Body Weight, FBW= Final Body Weight, TBWG= Total Body Weight Gain, DBWG= Daily Body Weight Gain, TFI= Total Feed Intake, DFI= Daily Feed Intake and FCR= Feed Conversion Ratio.

contrary to that of Adeniyi (2003), who reported that an increase in crude fiber would result in increased voluntary feed intake for growing rabbits. There were no significant ( $P>0.05$ ) differences in all other parameters measured. The results suggest that, the replacement of maize with YPM had no adverse effect on the growth performance of rabbits.

**Table 3: Carcass and Visceral Organs Characteristics of Rabbit Does fed graded levels Yam Peel Meal.**

PARAMETERS	T1(0%)	T2(25%)	T3(50%)	T4(75%)	SEM	P-v	LS
Live weight (g)	1757.33	1680.00	1742.33	1685.33	23.788	0.627	NS
Carcass weight (g)	1.188	1.173	1.202	1.188	0.018	0.967	NS
Dressing percentage (%)	0.068	0.070	0.069	0.073	0.001	0.428	NS
Right kidney (g)	4.129	3.542	3.536	3.537	0.129	0.293	NS
Left kidney (g)	4.215	3.714	3.916	3.555	0.141	0.435	NS
Heart (g)	4.636	4.388	3.917	3.202	0.389	0.644	NS
Liver (g)	36.073	33.066	37.005	23.740	3.052	0.449	NS
Lungs (g)	9.812	8.319	8.816	5.973	0.755	0.358	NS
Spleen (g)	0.990	0.658	0.858	0.704	0.074	0.417	NS
Esophagus (g)	2.244	1.955	2.091	1.394	0.140	0.208	NS
Trachea (g)	1.987	2.458	2.557	1.811	0.213	0.604	NS
Pancreas (g)	0.695	0.803	0.777	0.746	0.053	0.930	NS

NS= Not Significant, SEM= Standard Error of Mean, P-v= Probability Value, LS= Level of significance

Carcass characteristics and visceral organ weights of rabbit does fed graded level of Yam Peel Meal (YPM) is presented in Table 3. The result showed that, the test ingredient YPM did not exert any significant effects on all parameters investigated. The result showed YPM did not have any deleterious effect on internal organs like the lungs, heart, kidney, trachea, pancreas and spleen. It could therefore be concluded that maize replaced with YPM in rabbit diets did not have deleterious effect on major internal organs of the rabbit like the lungs, heart and kidney which could be used to access the toxicity of the feed.

## CONCLUSION

The result of the study indicates that yam peel meal (YPM) can be used successfully to replace maize up to 75% in conventional rabbit feeds without any depression or adverse effect on the growth performance as well as internal organs of growing rabbit does. Therefore, rabbit farmers are encouraged to replace maize with yam peel meal (YPM) up to 75% as energy source in the diets of growing rabbits to reduce the dependence on maize.

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