

EFFECTS OF BAMBARA NUT OFFAL FED AS A REPLACEMENT FOR WHEAT OFFAL ON GROWTH PERFORMANCE AND CARCASS YIELD OF WEANER RABBITS

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Abstract

To evaluate the effect of Bambara nut offal (BNO) fed as a replacement for wheat offal (WO) on growth performance and carcass yield of weaner rabbits, a total of 24 mixed breed unsexed weaner rabbits were purchased, weighed and randomly grouped into four dietary treatments of 6 replicates each. The four dietary treatments were made up of varying ratios (in percentages) of BNO and WO at 0:100, 25:75, 50:50 and 75:25 respectively. Initial and final body weights, feed intake and feed conversion ratio (FCR) of the rabbits were taken on a weekly basis and the carcass yield was determined at the end of the study. The experiment was laid out in a completely randomized design and data obtained were subjected to one-way analysis of variance. The study showed that replacement of WO with BNO did not significantly influence ($p>0.05$) growth performance of rabbits across replacement ratios. Increasing the ratio of BNO to WO produced carcass yield closer to that of rabbits on 100% WO. Also, no significant differences ($p>0.05$) were recorded for carcass parts of commercial importance across treatments aside from tail where rabbits on 25%BNO recorded value (0.45g) significantly higher ($p<0.05$) than others on higher BNO levels but all are similar in weights to that of rabbits on 100%WO. Replacing WO with BNO in weaner rabbits' diets is therefore recommended as it produced similar results on growth performance and carcass yields.

Keywords: Weaner rabbits, Bambara nut offal, Wheat offal, Carcass yield, Growth performance

Introduction

Nigerians have been reported to be consuming about 7g of protein per day which is lower than 28g/head/day recommended by FAO (Uchegbu *et al.*, 2007). Rabbit is among the new livestock being explored to beef up the shortage in animal protein supply due to their short maturity period and overall acceptability when compared to major livestock such as cattle, sheep, goat and chickens (Yusuf *et al.*, 2009). However, high cost of conventional feedstuffs which accounts up to 70% of the total production (Ijaiya, 2013) is a major challenge in animal production. Bambara nut offal is a cheap and commonly available fibrous waste gotten from processing of Bambara seed into flour used in preparing a delicacy called 'Okpa' in Southeastern part of Nigeria. Therefore, this study evaluated the effects of Bambara nut offal as a replacement for wheat offal on growth performance and carcass yield of weaner rabbits.

Materials and Methods

Preparation of the test ingredient

Bambara nut offal used for this experiment was sourced from Okpa processing centers in Igbo communities around Abeokuta, Ogun State. The offal was gotten after Bambara seed was washed, dried at 60°C for 8 hours, milled into flour and sieved. The dried Bambara nut offal collected was packed inside clean sacks, sundried to moisture content below 10% and taken to feed mill.

Experimental animals and management

A total number of 24 mixed breed unsexed weaner rabbits aged 6-7 weeks and weight range of 600-650g, were purchased from a reputable rabbit farm at Apata, Ibadan, Oyo state. On arrival, the initial weight of the rabbits were taken and randomly allotted into 4 experimental treatments of 6 replicates each. The animals were kept inside clean and disinfected wooden hutches and subjected to standard routine managements. Feed and water were provided to the animals *ad libitum* throughout the experimental period which lasted for eight weeks.

Experimental diets and design

Four different diets were formulated such that the control treatment groups were fed diet containing 0% inclusion of Bambara nut offal (BNO) as a replacement for wheat offal while experimental birds in the second, third and fourth treatment groups received diets containing 25%, 50% and 75% BNO as replacements for wheat offal. The experiment was laid out in a completely randomized design. The gross composition of the experimental diets is shown on Table 1.

Table 1: Gross composition (%) of the experimental diets for weaner rabbits.

Ingredients	Control	25%BNO	50%BNO	75%BNO
Maize	38.00	38.00	38.00	38.00
Soybean meal	17.00	17.00	17.00	17.00
Wheat offal	40.00	30.00	20.00	10.00
BNO	-	10.00	20.00	30.00
Fish meal (72%)	0.50	0.50	0.50	0.50
Bone meal	2.50	2.50	2.50	2.50
Limestone	1.48	1.48	1.48	1.48
Premix starter	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Toxin binder	0.02	0.02	0.02	0.02
Total	100.00	100.00	100.00	100.00
Determined analysis				
Metabolizable energy (Kcal/g)	2.52	2.53	2.55	2.56
Crude protein (%)	18.3	18.25	18.16	18.09
Crude fibre (%)	10.0	10.5	11.0	11.5

BNO- Bambara nut offal

Data collection

Growth performance

Weekly data was collected for growth parameter indices using the following formula:

$$\text{Weight gain per rabbit (g)} = \frac{\text{Final weight (g)} - \text{Initial weight (g)}}{\text{Number of rabbits}}$$

$$\text{Feed intake per rabbit (g)} = \frac{\text{Feed supplied (g)} - \text{Feed leftover (g)}}{\text{Number of rabbits}}$$

$$\text{Feed conversion ratio} = \frac{\text{Amount of feed consumed (g)}}{\text{Weight gain (g)}}$$

Carcass yield

At the end of the experiment, 4 rabbits were randomly selected from each treatment, stunned with chloroform and slaughtered by cutting the jugular vein. The slaughtered rabbits were scalded with naked fire and eviscerated. Live weight, hot carcass weight, empty carcass weight and carcass dressing percentage were determined and recorded. The carcass was cut into retail parts and internal organs which were weighed using sensitive electronic scale and expressed as percentage of live weight.

$$\text{Carcass dressing percentage} = \frac{\text{Empty carcass weight}}{\text{Live weight}} \times 100$$

Statistical Analysis

The data obtained were subjected into One-way Analysis of Variance (ANOVA) in a Completely Randomized Design using the GLM procedure of statistical analysis software SAS[®] version 2003. Significant ($p < 0.05$) differences among treatment means were determined using Duncan Multiple Range Test (DMRT) as contained in the SAS[®] software.

Results and Discussion

The result of growth performance of weaner rabbits fed Bambara nut offal (BNO) as a replacement for wheat offal (WO) as shown on Table 2 below showed no significant difference ($p > 0.05$) across the dietary treatments. However, the range of values recorded in this study for final weight gain (1433.30 – 1583.00g) is higher than the values (1200.00-1375.50g) reported by Igwebuike *et al.*, (2013) who replaced wheat offal with sorghum offal but lower than values (1213.20-1690.70g) reported by Oni *et al.* (2015). Also, the values obtained for feed conversion ratio (FCR) (3.50-4.75) is lower than values (3.49-7.77) reported by Igwebuike *et al.*, (2013). This result suggests that Bambara nut offal is low in antinutritional factors such as tannin which has been reported to reduce feed utilization and growth (Helsper *et al.*, 1993).

As also presented in Table 2, hot carcass weight, empty carcass weight and carcass length were not significantly affected ($p > 0.05$) with the inclusion of BNO as a replacement for wheat offal aside from carcass dressing percentage which is relatively higher in rabbits fed 75%BNO (69.61%) and similar to the rabbits on control diet (66.71%). More so, carcass cut parts of economic importance and internal organs were not significantly different ($p > 0.05$) in rabbits fed feed BNO containing diets and those fed 100%WO (control). The observation in this study is in conformity with what Igwebuike *et al.*, (2013) reported when weaner rabbits were fed sorghum offal as a replacement for wheat offal. However, significant differences recorded for weight of tails could be attributed to the different breeds of rabbits used in the experiment.

Table 2: Growth performance and carcass yield of weaner rabbits fed Bambara nut offal as a replacement for wheat offal.

Parameters	Control	25%BNO	50%BNO	75%BNO	SEM	P-value
GROWTH PERFORMANCE						
Initial body weight (g)	646.67	650.00	653.33	650.00	21.13	0.902
Final body weight (g)	1466.70	1433.30	1500.00	1583.00	65.56	0.859
Total feed intake (g)	3419.20	3339.80	3349.60	3253.00	38.10	0.556
Feed conversion ratio (FCR)	4.75	4.26	4.37	3.50	0.38	0.766
CARCASS MEASUREMENTS						
Live weight (g)	1480.00	1350.00	1600.00	1600	60.77	0.461
Hot carcass weight (g)	1416.70	1123.30	1500.00	1516.70	71.26	0.171
Empty carcass weight (g)	1016.70	696.70	900.00	1116.70	70.89	0.177
Carcass dressing percentage (%)	66.71 ^{ab}	51.59 ^c	56.26 ^{bc}	69.61 ^a	2.65	0.017
Carcass length (cm)	44.67	44.83	45.17	44.97	0.15	0.751
Cut parts (%LW)						
Head	10.38	7.57	8.21	9.10	0.53	0.287
Neck	0.87	0.92	1.16	0.83	0.05	0.072
Ribs	12.75	9.84	8.96	11.18	0.67	0.211
Shoulders	8.96	7.06	8.70	7.88	0.42	0.427
Thighs	12.17	12.56	10.40	10.62	0.57	0.485
Loin	12.85	10.60	13.85	11.19	0.65	0.295
Rump	7.24	3.71	4.90	4.63	0.54	0.103
Tail	0.35 ^{ab}	0.45 ^a	0.23 ^b	0.27 ^b	0.03	0.011

Limbs	6.79	6.03	6.87	6.03	0.30	0.685
Internal Organs (%LW)						
Liver	2.92	2.39	2.95	2.52	0.15	0.472
Heart	0.31	0.21	0.24	0.28	0.02	0.184
Kidney	0.88	0.65	0.82	0.64	0.05	0.167
Lung	0.47	0.57	0.55	0.49	0.02	0.413
Spleen	0.06	0.04	0.04	0.05	0.004	0.671
GIT	20.12	17.42	19.50	17.67	0.89	0.704

Means on the same column having different superscript differ significantly at $p < 0.05$

BNO- Bambara nut offal

SEM- Standard error of mean

Conclusion and Recommendation

As observed from the results of this study, replacement of wheat offal with Bambara nut offal in weaner rabbits diets at levels of 25-75% produced results similar to that of rabbit fed 100% wheat offal for growth performance and carcass yield. Therefore, Bambara nut offal should be used as a replacement for wheat offal at up to 75% replacement level for proper growth, carcass yields and feeding cost saving.

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