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GROWTH RESPONSE AND CARCASS YIELD OF GROWER RABBITS FED DIETS CONTAINING BAOBAB (*Adansonia digitata*) PULP MEAL

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ABSTRACT
This study was conducted to determine the effect of Baobab (Adansonia digitata) Pulp Meal (BPM) on growth performance and carcass characteristics.. Fifteen grower rabbits (Mongrels) were fed diets containing 0, 1.5, 3, 4.5 and 6% designated as T1, T2,T3, T4 and T5 respectively. Treatments were allocated to grower rabbits in a completely randomized design (CRD) and each treatment was replicated three (3) times consisting of one (1) rabbit per replicate. The experiment lasted for 8 weeks. The results indicated significant (P<0.05) differences in the final body weight, average daily weight gain, Daily feed intake, feed conversion ratio and feed cost per kilogram gain. Rabbits fed 4.5% (T_4) BPM had significantly (P<0.05) highest values of final body weight (1550.00 g) and daily weight gain (22.44g). Better values of feed conversion ratio (3.26) and feed cost per kilogram gain (₦203.46) were obtained for grower rabbits fed 4.5 BPM diet (T_4) compared to others. Similarly, the values of final live weight, carcass weight and dressing percentage were significantly (P<0.05) higher for rabbits on the 4.5% levels of Baobab Pulp meal. Based on this study, it was concluded that baobab (Adansonia digitata) Pulp meal can be used as feed ingredient in the diet of grower rabbits up to 4.5% level without any adverse effect on performance and carcass yield. It was recommended that BPM can be incorporated in the diet of grower rabbits up to 4.5% for reduction of the feed cost and cost of production.

Keywords: Baobab pulp meal, rabbit, performance and carcass yield

INTRODUCTION
The rapid increase in the population of the world has resulted in a huge increase in the demand for animal protein which is essentially higher in quality than that of plant protein, (Odunsi, 2003). Many Nigerians do not take enough products of animal origin (Igwebuike *et al.*,1999). Esonu, (2000) reported that the average consumption of animal protein in this country is 4.5g/head / day as against a minimum requirement of 35g/head/day recommended by Food and Agricultural Organization of the United Nations (FAO, 2007). However, increasing the dietary animal protein intake at a reasonable cost using micro livestock has been part of the National Agricultural Policy (Sabayo *et al.,* 2007). 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, 2006). Rabbits are known to have the ability to thrive on non-conventional feedstuffs and forages which cannot be consumed directly by man. Baobab pulp meal contains substantial amount of energy and rich in vitamin C (Mwale *et al*., 2008). The broad objective of this research is to determine the effect of dietary utilization of baobab pulp meal on the performance of grower rabbits.

MATERIAL AND METHODS

Experimental Site

The experiment was conducted at the Rabbitry unit of the Teaching and Research Farm of the Department of Animal Science, Faculty of Agriculture and Agricultural Technology, Kano University of Science and Technology, Wudil.(Olofin *et al.*, 2008).

Experimental Animals and their Management

A total of fifteen (15) mongrel grower rabbits of 5 weeks were used for the study. The rabbits were raised in a wooden hutches measuring 40 x 60 x 60 cm dimensions suspended from the ground. The rabbits were purchased from local market within Wudil local government area. Prior to the commencement of the study, the feeding troughs and drinkers were properly washed, cleaned, disinfected and fixed in the treatment pens. Feed and water were offered *ad libitum* daily.

Experimental Diets and Design

Baobab pulp was purchased from Darki market in Wudil Local Government Area of Kano state. Five diets were formulated in which baobab pulp meal (BPM) was included at dietary levels of 0, 1.5, 3.0, 4.5 and 6% designated as T_1, T_2, T_3, T_4 and T_5 respectively as shown in Table 1.. Treatments were offered to rabbits in a completely randomized design (CRD) and each treatment was replicated three (3) times consisting one (1) rabbit per replication. The experiment lasted for eight (8) weeks after two weeks of adaptation period.

Data collection and Analysis

The five treatments were offered on daily basis and leftovers were also weighed after feed consumed on daily basis. The weight gain was determined on weekly basis and by subtracting the previous weight from the final weight obtained. At the end of the experiment, rabbits were slaughtered and eviscerated for carcass analysis. All data generated were subjected to the analysis of variance in statistical analysis system was used for the analysis (SAS, 2005). Where significant differences exist between treatments means, Duncan Multiple Range Test was used to separate the means.

RESULTS AND DISCUSSION

The results on the performance of grower rabbits fed diet containing Baobab (*Adansonia digitata*) Pulp Meal is presented in Table 2. The results indicated a significant ($P<0.05$) differences in the final live weight, average daily weight gain, total weight gain, Daily feed intake, total feed intake, feed conversion ratio and feed cost per kilogram. Rabbit fed 4.5% (T_4) had significantly ($P<0.05$) higher value for final body weight (1550.00g) compared to those fed other diets. There was steady significant ($P<0.05$) improvement in total weight gain and average daily weight gain up to the 4.5% BPM diet (T4). Similarly, the total feed intake and average daily feed intake followed the same trend. This could be due to the crude protein and palatability of the diet which might enhance acceptability and utilization. Better values of feed conversion ratio(3.26) and feed cost per kilogram gain (₦203.46) were obtained for grower rabbits fed 4.5% BPM diet (T_4) compared to others This is in line with the report of Tamburawa (2015) who reported the lower the feed conversion the better the diet in monogastric animal feeding.

The result of the carcass analysis is presented in Table 3. All the carcass parameters were significantly ($P<0.05$) affected by dietary inclusion levels of Baobab (*Adansonia digitata*) Pulp meal. The final live weight, carcass weight and dressing percentage were significantly ($P<0.05$) higher for rabbits on fed 4.5% BPM diet compared to others. The values of carcass weight (573.33g-1048.33g) and dressing percentages (50. 22 - 68. 67%) obtained in this study were close to the values reported by Ezeagu (2005).It was observed that the values of carcass weights and dressing percentages increased up to 4.5% baobab (*Adansonia digitata*) Pulp Meal in the diet. This might be due to reflection of the relatively feed

intake and feed utilization by the rabbits compared to others. Adeniji and Lawal (2013) indicated that the carcass quality is closely related to feed intake and levels of nutrients especially protein and energy.The values obtained are in agreement with the values reported by (Heuzé *et al.,*2013).

CONCLUSION

Based on these results, it was concluded that grower rabbits can utilize Baobab (*Adansonia digitata*) Pulp meal up to 4.5% inclusion levels without any adverse effect on growth performance and carcass yield.

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Table 1: Composition of the Experimental Diets containing Baobab Pulp meal

	Treatments				
Ingredients	**T1 (0%)**	**T2 (1.50)**	**T3 (3.00)**	**T4 (4.5%)**	**T5 (6%)**
Maize	52.66	51.66	51.16	50.16	50.16
Soybean meal	11.43	11.18	10.43	10.43	8.93
Groundnut cake	2.86	2.61	2.36	1.86	1.86
Baobab Pulp	0.00	1.50	3.00	4.50	6.00
Fish meal	3.50	3.50	3.50	3.50	3.50
Wheat offal	25.00	25.00	25.00	25.00	25.00
Bone meal	3.50	3.50	3.50	3.50	3.50
Salt	0.30	0.30	0.30	0.30	0.30
Methionine	0.30	0.30	0.30	0.30	0.30
Lysine	0.20	0.20	0.20	0.20	0.20
P.Vitamin/mineral mixture	0.25	0.25	0.25	0.25	0.25
Total	**100**	**100**	**100**	**100**	**100**
Calculated analysis					
Crude protein (%)	18.00	18.000	18.00	18.00	18.00
ME(Kcal/kg)	2578	2580	2597	2556	2562
Crude fiber (%)	12.34	13.24	10.22	12,23	11.34

Table 2: Growth Performance of rabbits fed diets containing Baobab Pulp Meal

	Treatments					
Parameters	**T1**	**T 2**	**T 3**	**T 4**	**T 5**	**SEM**
Initial Live weight (g)	606.67	607.33	613.33	606.33	609.67	0.77^{ns}
Final body weight (g)	1181.67^{c}	1238.67^{b}	1309.33^{b}	1550.00^{a}	1309.33^{b}	3.33^{**}
Daily weight gain (g)	13.71^{b}	16.19^{b}	16.83^{b}	22.44^{a}	16.22^{b}	0.51^{*}
Total weight gain (g)	574.63^{a}	680.12^{b}	707.00^{b}	942.48^{a}	698.678^{b}	3.38^{*}
Daily feed intake (g)	76.63	80.39	76.25	76.51	81.07	0.71^{ns}
Total feed intake (g)	3210.30	3202.40	3212.90	3418.40	3362.70	4.59^{ns}
Feed conversion ratio	5.65^{a}	5.10^{ab}	4.75^{ac}	3.26^{c}	3.98^{c}	0.2^{*}
Feed Cost (₦/Kg gain)	267.71^{ab}	285.37^{a}	228.20^{ab}	203.46^{b}	289.21^{a}	2.15^{ns}
Mortality rate (%)	0.00	0.00	0.00	0.00	0.00	0.25^{ns}

^{abc}=Means with different superscripts on the same row are significantly different (P<0.05)

Table 3: Carcass characteristics of rabbits fed Diets containing Baobab Pulp Meal

	Treatments					
Parameters	**T1 (0%)**	**T 2 (1.5%)**	**T 3 (3%)**	**T 4 (4.5%)**	**T 5 (6%)**	**SEM**
Final Live weight (g)	1181.67^{b}	1238.67^{b}	1309.33^{b}	1550.00^{a}	1309.33^{b}	3.33^{**}
Carcass weight (g)	696.67^{bc}	760.00^{b}	873.00^{b}	1048.33^{a}	573.33^{c}	3.25^{**}
Dressing percentage (g)	61.95^{a}	61.52^{a}	61.59^{a}	68.67^{a}	50.22^{b}	0.9^{**}
Abdominal fat (g)	2.38^{b}	1.87^{b}	10.20^{a}	3.32^{b}	1.54^{b}	0.34^{**}
Stomach (g)	8.26^{c}	9.51^{bc}	10.21^{b}	12.88^{a}	10.20^{b}	0.29^{**}
Caecum weight (g)	14.98^{ab}	16.48^{a}	12.06^{b}	15.37^{ab}	17.13^{a}	0.44^{*}
Caecum length (g)	54.33^{a}	66.00^{a}	38.33^{b}	63.67^{a}	62.33^{a}	0.44^{**}
Colon weight (g)	1.88^{bc}	1.66^{c}	2.55^{a}	2.67^{a}	2.33^{ab}	0.18^{**}

Large intestine length (g)	112.67[a]	115.67[a]	110.67[ab]	99.67[b]	80.67[c]	0.85**
Small intestine length (g)	215. 33[c]	224. 33[bc]	271. 00[a]	248. 67[ab]	207. 00[c]	1.30***

[abc]=Means with different superscripts on the same row are significantly different (P<0.05)