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GROWTH PERFORMANCE OF BROILER CHICKENS FED DIETS CONTAINING SUN DRIED CASSAVA PEEL MEAL BLENDED WITH PALM OIL SLUDGE

¹Ezeoke, F. C., ¹Ejiogu, P. O., ¹Odinuta, E. C. and ²Igila, T. T

¹Department of Animal Science, Chukwuemeka Odumegwu Ojukwu University Igbariam Campus

²Department of Animal Production, Abubakar Tafawa Balewa University Bauchi.

*Corresponding author: richfrank101@gmail.com; +2348067182660

Abstract

This study was conducted to examine the growth performance of broiler chickens fed diets containing graded levels of sun-dried Cassava Peel Meal mixed with Palm Oil Sludge (CPMPOS). One hundred and fifty (150) day-old chicks of aggritted breed were used for the experiment. The birds were randomly assigned to five different dietary treatments with thirty birds (30) per treatment. Treatments were replicated three times with 10 chicks per replicate in a Completely Randomized Design (CRD). The dietary groups were designated as T1 for control (0 % CPMPOS), T2 (2.5 % CPMPOS), T3 (5 % CPMPOS), T4 (7.5% CPMPOS) and T5 (10% CPMPOS). The experiment lasted for fifty-six days. Data were collected on growth indices and economics of production was computed. In the starter stage, the results showed that there were no significant differences ($p > 0.05$) in all parameters which are initial body weights, final body weights, total body weight gains, average body weights, average feed intake and feed conversion ratio, while in cost benefit analysis, the costs of production of birds that were fed diets 2, 3, 4 and 5 were all cheaper than that of diet 1 which is control diet with diet 2 attracting the least cost. The finisher phase results showed that there were significant differences ($P < 0.05$) between the treatment groups in the initial body weights of the experimental birds. Birds fed diet T3 scored the best value of 1504.67 g. The finisher phase recorded significant difference on the feed conversion ratio among the treatment groups with treatment 5 scoring the best value of 1.77. In the cost benefit analysis, the cost of production of birds fed diets 2, 3, 4 and 5 were all cheaper than that of 1 with treatment 3 attracting the least cost. The study concluded that cassava peel meal mixed with palm oil sludge (CPMPOS) can be included up to 10kg level in the diet of broiler chicken to enhance growth which leads to high yield of saleable cut parts and better economic returns

Keywords: Broiler, cassava peel meal, palm oil sludge, performance, economics analysis

Introduction

Developing countries have continued to increase in population resulting in increased demand for animal protein for human consumption (Sobayo *et al.*, 2007). Energy is a critical component of poultry rations, which is essential for life along with other major nutrient classes (Cheeke, 2005). There is need also to increase the production of animal products so as to bridge the animal protein gap in Nigeria. In Nigeria, the high cost of conventional sources of energy and protein is largely responsible for the present high price of finished feeds. Also, competition between man and animal for the conventional energy feedstuffs leading to scarcity of feed ingredients also poses problem of proper feeding of livestock species (Iyayi and Davies, 2005). Therefore, there is an urgent need to explore the available and less competitive non-conventional feed ingredients. Such alternatives are cassava peels and palm oil sludge. The two farm wastes are locally available and underutilized but hold much agronomic potentials. Thus, with emerging technologies of drying, grating and preserving cassava peels, it holds the key to providing a readily available and sustainable source of feeding for domestic animals (Ayomide, 2018). Cassava peels are rich in energy, therefore can be used as source of energy in poultry diets. Effective reduction of levels of anti-



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nutritional factors present in formulated rations and the quality of the feed therefore will be determined by the effectiveness of the processing methods employed. The aim of this study therefore, was to investigate the effects of feeding diets containing graded levels of sundried cassava peel mixed with palm oil sludge-based on the growth performance of starter and finisher broilers.

Materials and Methods

The experiment was conducted at the poultry unit of the Animal Science Department Teaching and Research Farm, Chukwuemeka Odumegwu Ojukwu University, Igbariam Anambra State. Cassava peel was collected from Achalla town in Oyi Local Government Area in Anambra State, sun-dried and grated with a conventional grating machine. The cassava peel meal was combined with palm oil sludge and thoroughly mixed manually to achieve a homogeneous mass. The mixtures were weighed to get different levels of Cassava peel meal mixed with palm oil sludge (CPMPOS). Five diets were compounded such that diet 1 (control) contained maize as the energy source. In diets 2, 3, 4 and 5, the sun-dried cassava peel and palm oil sludge (CPMPOS) mixture was used to replace maize in the proportion of 0, 2.5, 5.0, 7.5 and 10 % respectively.

One hundred and fifty (150) day old chicks of Agrite breed were obtained from a commercial hatchery and brooded using a deep litter system. The birds were randomly assigned to five (5) treatment groups of thirty (30) birds each. Each group was sub divided into three (3) replicates of ten (10) birds. Data were collected on growth indices and economics of production was computed. Data generated were subjected to Analysis of Variance (ANOVA) as described by Steel and Torrie (1980), Separation of significantly different means were carried out using Duncan's Multiple Range Test as described by Duncan (1955) with a statistical mode

Table 1: Ingredient composition of experimental broiler starter diets(%)

Ingredients	T1	T2	T3	T4	T5
Maize	55.00	52.50	50.00	47.50	45.00
Palm kernel cake	3.00	3.00	3.00	3.00	3.00
Soya bean meal	29.00	29.00	29.00	29.00	29.00
CPMPOS	00.00	2.50	5.00	7.50	10.00
Wheat offal	2.00	2.00	2.00	2.00	2.00
Brewer's grain	2.00	2.00	2.00	2.00	2.00
Fish meal	5.00	5.00	5.00	5.00	5.00
Bone meal	3.00	3.00	3.00	3.00	3.00
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Vitamin premix	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00
Calculated values					
Crude protein(%)	23.58	23.18	23.03	22.88	22.73
Metabolizable Energy (ME) Kcal/kg	2976.00	2940.90	2905.80	2870.70	2835.60



Table 2: Composition of experimental broiler finisher diets(%)

Ingredients	T1	T2	T3	T4	T5
Maize	60.00	57.50	55.00	52.50	50.00
Palm kernel cake	3.00	3.00	3.00	3.00	3.00
Soya bean meal	22.00	22.00	22.00	22.00	22.00
CPMPOS	0.00	2.50	5.00	7.50	10.00
Wheat offal	2.00	2.00	2.00	2.00	2.00
Brewer's grain	4.00	4.00	4.00	4.00	4.00
Fish meal	4.50	4.50	4.50	4.50	4.50
Bone meal	3.50	3.50	3.50	3.50	3.50
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Vitamin premix	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00
Calculated values					
Crude protein(%)	20.65	20.47	20.35	20.20	20.05
MetabolizableEnergy(Kcal/kg)	2984.30	2949.20	2914.10	2879.00	2843.90

CPMPOS: Cassava peel meal plus Palm oil sludge

Table 3: Effect of processed cassava peel meal blended with palm oil sludge-based diet the performance of starter broiler birds

Parameters	T1	T2	T3	T4	T5	SEM
IBWT(g)	35.40	34.36	34.03	34.60	34.00	0.30
FBWT(g)	10650.00	11126.67	11403.33	10920.00	11960.00	196.90
TBWTG(g)	10614.70	1192.30	11369.30	10679.00	11926.00	205.50
ADFI(g)	67.42	61.84	72.26	75.85	72.61	2.20
FCR	1.80	1.55	1.80	1.98	1.70	0.07

SEM-Standard Error of Mean; IBWT - Initial body weight, TBWTG- Total body weight gain; FBWT- Final body weight; ADBWT Average daily body weight gain; ADFI- Average daily feed intake, FCR- Feed conversion ratio

Table 4: Effect of cassava peel meal blended with palm oil sludge-based diet on the growth performances of finisher broiler birds

Parameters	T1	T2	T3	T4	T5	SEM
IBWT(g)	1385.33 ^{ab}	1360.67 ^b	1504.67 ^a	1394.33 ^{ab}	1406.00 ^{ab}	20.60
FBWT(g)	2380.33	2229.00	2563.33	2510.67	2100.33	70.24
TBWTG(g)	995.00	868.33	1058.67	1116.33	694.33	62.76
ADFI(g)	114.80	117.66	109.17	119.53	121.68	2.66



FCR	1.18 ^b	1.36 ^{ab}	1.07 ^b	1.15 ^b	1.77 ^a	0.09
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^{a,b} means along the same rows with different superscripts are significant (P<0.05)
SEM – Standard Error of Means.

Table 5: Economics analysis of dietary levels of sundried cassava peel meal mixed with palm oil sludge for finisher broiler

Parameter	T1	T2	T3	T4	T5	
Feed cost (N/kg)	323.81		316.68	309.57	302.45	245.32
Feed cost saving	-		7.13	14.24	21.36	28.49
Feed cost (N /kg) meat Produced	382.09		411.68	331.24	347.81	522.72

Discussion

The growth performance of broiler chickens is shown in Table 3. The slightly low final body weights can be attributed to hatchery or breed problem since it cuts across the entire treated diets. The treated diets compared (P>0.05) favourably with the control for final weight. This showed that the treated diets met the nutrient requirement for raising broiler chicken (Borin et al., 2005) and that cassava peel meal mixed with palm oil sludge (CPMPOS) can successfully replace maize up to 10% on the diet of broiler chicken. The increase in feed intake as the level of replacement of maize with CPMPOS increased could be attributed to the fibrous nature of the diet which perhaps brought about physical bulkiness which fed to the intake of the more fibrous diet. Final body weights compare favourably with those published by Odukoya *et al* (2019) whose study was on growth response of broiler chicken on different daily feeding frequency. The increase in feed intake as the level of replacement of maize with CPMPOS increased could also be attributed to the fibrous nature of the diet which perhaps brought about physical bulkiness which made the intake to be high since the birds feed more to acquire more energy or make up their energy level (Ewa *et al.*, 2019). Treatment 3 has the least ₦/kg of meat produced (₦331.24). These findings corresponded with the cost analysis of the trial done by Obikaonu *et al* (2010) on nutritional evaluation of ensiled and sundried cassava peel meal.

Conclusion and Recommendation

From the study, the results showed that birds on diet 7.5 % of CPMPOS did better in body weight gain. Therefore, it is advisable for farmers to use that level of inclusion to prepare their broiler feed for better meat production.

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Sobayo, R.A., Okubayo, O. A., Adeyemi, O. A. and Usman, J. M. (2007). Nutritional evaluation of gluten in rabbit diet. Proc. 32nd Ann. Conf. Nig. Soc. Anim Prod. graded levels of maize