EFFECT OF PALM KERNEL AND CASSAVA PEEL MEALS ON GROWTH PERFORMANCE OF FINISHER BROILERS

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ABSTRACT
An experiment was conducted to evaluate the effects of palm kernel and cassava peel meals on growth performance of finisher broilers. One hundred and eighty (180) four week old broiler birds of Anak strain were used. The birds were first raised together and fed a single starter feed for the first four weeks. Thereafter, they were assigned into four dietary treatments (T) of 45 birds.The dietary treatmentswereeach replicated threetimes. There 15 birdsin each replicate arrangedin completely randomized design (CRD). Treatment one (T1) was given a diet containing palm kernel meal but without cassava peel meal as the control while treatments 2 – 4 contained respectively 25, 50 and 75% cassava peel meal in replacement of palm kernel meal. The diets were fed for four weeks during the finisher phase (week 5 – 8).Feed and water were offered *ad libitum*. The diets had no significant ($P>0.05$) effect on final live weight, weight gain, feed intake and feed: gain ratio. In conclusion, up to 75% of cassava peel meal could be included in final diets for broiler chickens in replacement of palm kernel meal.

Keywords: Finisher broilers, growth performance, palm kernel meal, cassava peel meal.

INTRODUCTION
Poultry keeping in Nigeria has been one of the most popular enterprises adopted by small and medium scale farmers in both rural and semi urban areas. It was first introduced to Nigeria in the late fifties with the importation of selected breeds of exotic poultry, namely Rhode Island Red, White Leghorn, Barred Plymouth Rock and a number of other breeds and hybrids (Obioha, 1992). Poultry is practically kept by every household in Nigeria especially in the rural communities. Poultry feeding however stands out as a major item of cost in poultry production. It accounts for 70 – 80% of cost of production. To reduce feed cost in poultry production agro industrial by-products such as palm kernel meal, wheat offals, rice bran are used. Palm kernel meal is becoming expensive. This calls for search for alternatives to palm kernel cake. Cassava peel which is the major wastes generated during cassava processing could be used. Nigeria is one of the largest producers of cassava in the world. It is estimated that millions of tons of cassava peels are generated from cassava processing in Nigeria annually (Tewe, 2004). Dry cassava peels contain higher protein (< 6%) than other tuber parts (Tewe, 2004). A major challenge is the presence of hydrogen cyanide in cassava peel meal. The hydrogen cyanide content can be reduced substantially by drying under the sun and milled. Cassava peels have been found to contain 86.5 - 94.5% dry matter, 80-93.3% organic matter, 10-31.8% crude fibre and 0.7-1.0% nitrogen (Ifut, 1991). Dry cassava peels have been reported to be a good feed supplement in ruminant production (Ifut, 1991). Therefore the objective of this study was to determine the effect of partial replacement of palm kernel meal with cassava peel meal on finisher broilers.

MATERIALS AND METHODS
The study was conducted at the poultry unit of the University of Uyo Teaching and Research Farm (latitudes 4^0 59 and 5^0 04N and longitudes 7^0 53 and 8^0 00E) with a mean annual rainfall of 3000 mm and a relative humidity of 81% (University of Uyo Meteorological center).
Fresh cassava peels (TMS 419) was obtained from cassava processing factory. The peels were dried under the sun which took five days. At the end of the drying, the peels were ground to pass through 1mm sieve and stored in transparent plastic containers. Proximate analysis of the meal was carried out according to AOAC (1990). Hydrogen cyanide content of the cassava peal meal was also analyzed.

Experimental Design and Management of Birds

One hundred and eighty unsexed day old chicks (Anak strain) were used for the experiment. They were divided into four dietary treatments (T). Each treatment with 45 birds was replicated three times. The replicates had 15 birds each. The experiment was arranged in completely randomized design (CRD). Replacement of palm kernel meal (PKM) in the diet with the cassava peel meal (CPM) was such that; T1 = control finisher feed containing 15% PKM and no CPM, T2 = diet with 11.25% PKM + 3.75% CPM, T3 = diet with 7.5% PKM + 7.5% CPM and T4 = diet with 3.75% PKM + 11.25% CPM. These represented (100% PKM + 0%); (75% PKM + 25% CPM); (50% PKM + 50% CPM) and 25% PKM + 75% CPM) respectively. Formulated starter feed was fed to all the birds at the starter phase which lasted for the first four weeks. The birds were provided with extra heat by the use of kerosene stove for 21 days. Vaccination against Newcastle and Gumboro diseases was carried out during the starter phase. Feed and water were given to the birds *ad libitum*. At the end of the fourth week, the birds were allotted to the four treatments making sure that the treatments had similar average weight. The CPM was introduced at the finisher phase starting from the fifth week and lasted till the eighth week. Anti-microbial drugs were given at intervals as prophylactic measures starting from the starter phase.

Data Collection and Analysis

Data were collected on live weight and feed intake. Feed: gain ratio was calculated. All the data generated were subjected to analysis of variance (ANOVA) according to Steel and Torrie (1980). Significant means were separated using New Duncan multiple range test (NDMRT).

RESULTS AND DISCUSSION

Proximate composition of the cassava peel meal indicated protein to be 5.56%, crude fibre 17.50%, ether extract 1.15% and ash 5.01%. Morgan and Choct (2016) reported similar values. The hydrogen cyanide level of the cassava peel meal was 11.73mg/100g which was far below 50mg/100g regarded as safe level for livestock (Ukachukwu, 2005).The effect of cassava peel meal on growth performance of finisher broilers is indicated on Table 2.There were no significant differences on live weight, feed intake and feed: gain ratio. This shows that the cassava peel meal did not impart negatively on the birds. This could be attributed to the low level of hydrogen cyanide in the cassava peel meal. Hydrogen cyanide was reported by Iyayi and Tewe (1994) and Eruvbetine and Afolami (1992) to impart negatively on the performance of broilers. Feed intake that was insignificant is in consonant with the findings of Ukachukwu (2005) who reported similar results when cassava peel was substituted at 25, 50, 75 and 100% levels. This also corresponded with the report of Igwebuike and Okonkwo (1993) who recommended up to inclusion levels of 60% cassava peel meal in poultry rations. Ogbonna and Adebowale (1993) also reported that cassava peel meal was good in ration of cockerel but stressed the need for proper processing to reduce the cyanide content which was the major antinutritional factor.

There were no physical deformities or mortality noticed on the birds fed the cassava peel meal, confirming nontoxic nature of the test cassava peel meal. Ogbonna and Adebowale (1993) reported that anti- nutritional factors in the diet of any livestock species could lead to negative effects such as reduction in palatability, digestibility and utilization of the ration. Intoxication of different classes of livestock could occur resulting in mortality or decreased production due to the presence of plant hazardous residues (Eruvbetine *et al.*, 2003). In conclusion, 75% of palm kernel meal could be replaced by sun dry cassava peel meal in finisher broiler diet.

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Table 1 Composition of Experimental Diets

	Starter Diet	Finisher Diets			
Ingredients	DS	T1(0.0%)	T2 (25%)	T3 (50%)	T4 (75%)
Maize	52.0	53.0	53.0	53.0	53.0
Soybean meal	30.0	26.0	26.0	26.0	26.0
Palm kernel cake	11.30	15.0	11.25	7.50	3.75
Cassava peel meal	0.00	0.00	3.75	7.5	11.25
Fish meal	3.00	2.30	2.30	2.30	2.30
Bone meal	3.00	3.00	3.00	3.00	3.00
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10	0.10
Methionine	0.10	0.10	0.10	0.10	0.10
Premix	0.25	0.25	0.25	0.25	0.25
Total	**100**	**100**	**100**	**100**	**100**
Composition (%)					
Crude protein	22.01	20.41	20.22	20.18	19.75
Ether extract	3.65	6.06	5.94	5.79	4.86
Fibre	3.40	5.30	7.91	10.11	12.03
Calcium	1.20	1.02	1.01	1.02	0.02
Phosphorus	0.95	0.85	0.85	0.84	0.84
Lysine	1.21	1.01	1.01	1.01	1.01
Methionine	0.44	0.38	0.38	0.38	0.38
Energy(KcalME/kg	2870	2875	2865	2855	2845

** Premix supplied the following per kg diet: Vit A 10,000,000 Iμ; Vit D_3 2,000,000Iμ; Vit E_8.000 Iμ: Vit K_2. 000mg; Vit B_1 2,000 mg; Vit B_2 5,500mg; Vit B_6 1,200 mg; Vit B_{12} 12 mg; Biotin 30 mg; Folic Acid 600 mg; Niacin 10,000 mg; Pantothenic Acid 7,000mg; Choline chloride 500,000 mg; Vit C 10,000mg; Iron 60,000 mg; Mn 80,000 mg; Cu 8,00mg; Zn 50,000 mg; Iodine 2,000 mg; Cobalt 450 mg; Selenium 100 mg; Mg 100,000 mg; Anti-Oxidant 6,000 mg

Table 2 Effect of Cassava Peel meal on growth Performance of Finisher Broiler Chickens

Parameters	T1 (0.0%)	T2 (25%)	T3 (50%)	T4 (75%)	SEM
Initial weight(g/bird)	900	980	920	950	55.00
Final weight (g/bird)	2430	2380	2378	2380	100.00
Daily gain (g/bird)	54.64	50.00	52.07	51.07	10.05
Total feed intake (g/bird)	3080	3082	3090	3100	201.00
Daily feed intake	110.00	110.07	110.36	110.71	32.08
Feed conversion ratio	2.01	2.20	2.12	2.17	0.16