GROWTH PERFORMANCE OF FINISHER BROILERS CHICKENS FED DIETS CONTAINING GRADED LEVELS OF CASSAVA (*Manihot esculenta*) PEEL MEAL SUPPLEMENTED WITH ENZYME

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ABSTRACT
This study was conducted to determine the effects of cassava peel meal (CPM) based diets supplemented with multigrain multienzyme in the diets of finisher broiler chickens on growth performance. One hundred and eighty (180) four weeks Arbor acre strain broiler chickens were used for the experiment. Five dietary treatments comprising of maize without cassava peel meal and enzyme served as the control (T1) while T2, T3, T4 and T5 contained cassava peal meal diets with 0.0% multigrain multienzyme at inclusion levels of 6%, 12%, 18% and 24%, respectively, were formulated. Each treatment was replicated thrice with 12 birds per replicate and arranged in completely randomized design (CRD). The experiment lasted for four weeks during which data were collected on growth performance. All parameters measured were significantly different (P<0.05) with birds on diet 3 (12% CPM) supplemented with enzyme had higher final body weight (2050.05g) and daily weight gain (1513.44g) than birds on the control diet with final body weight (1320.00g) and birds on other test diets. Feed conversion ratio (FCR) of (1.69) was better among birds on diet 2 than birds on other dietary treatments. It can be concluded that performance indicators of finisher broilers could be improved through enzyme supplementation of cassava peel meal optimally at 12% level of supplementation.
Keywords: Cassava peel meal, multienzyme, chickens, Growth, Improvement

INTRODUCTION

Nigeria as a nation is endowed with both natural and human resources that can enhance animal protein consumption by the populace, but the reverse is the case in the actual sense of it. There is virtually a shortage of animal protein consumption among the citizenry. This low consumption of animal protein is attributed to high cost of feed which amount to about 60-80% of total cost of poultry production (Fanimo *et al*., 2017). The most challenging feed ingredient is maize which form primary source of energy needed for compounding livestock feed especially poultry birds. It constitutes about 50% of the diets for monogastric animals (Ajaja *et al*., 2002). Maize is scarce and costly due to stiff competition between man and livestock and industries. As a result of this predicament, animal nutritionists have been advocating for usage of alternative feed ingredients to replace this energy source as a remedy to ameliorate this shortage. The agricultural wastes such as maize offal, cotton seed cake, cashew pulp waste have been evaluated and exploited in this regard and are found far cheaper compared to conventional feed ingredients. Cassava peel is among these agricultural wastes that could substitute maize without undermining the health of the animal. Cassava peel is a byproduct from cassava processing factories in Nigeria (Aro, 2008). It is left without been exploited thereby causing environmental hazard (Ajagbe, 2021). Aro (2010) opined that if cassava peel is processed, it may be used as livestock feed. Odunsi *et al.* (2001) observed that the inclusion of cassava peels up to 30% in the diets of broilers resulted in reduction in feed intake and weight gain in both starter and finisher broilers. This may be as a result of presence of high level of cyanogenic compounds, fibre and phytate in cassava peel which has poor digestibility, hence, causing decrease in growth. Ndelekwute *et al*. (2020) opined that value could be added to cassava peel meal by addition of additives to the diet of monogastric animals especially poultry to alleviate the problem encountered in the utilization of nutrients in such diet. The use of exogenous enzymes is considered to be appropriate to enhance the nutritive value of cassava peel meal. It has been reported by Kiarie *et al*. (2013) that exogenous enzyme has the capability to negate the effect of anti- nutritive factors in cassava peel and enhance nutrient availability to the animals. Again, enzyme supplementation enhances performance of broiler chicks, improve feed conversion efficiency, dry matter digestibility, decrease jejuna content viscosity and thereby increase weight gain (Alagawany *et al*., 2018). Hence, the objective of this study was to determine the growth performance of finisher broilers fed diets containing graded levels of cassava peel meal (CPM) supplemented with multigrain multienzyme as substitution for maize.

MATERIALS AND METHODS

Experiment Site

The study was conducted at the Poultry Unit of Catholic Church Estate, Otu-Egunbe, Kabba, Kogi State. Kabba is located in guinea savannah belt of Nigeria between latitude 7°50[1]N of the equator and longitude 6°04[1]E of the Greenwich Meridian (KCA, 2010). Cassava peel was obtained from Kabba and its environs. Cassava peel was

sourced free without charge from cassava processing centers in Kabba and its environs. Other ingredients such as maize and soya beans, salt was bought from open market in Kabba, Kogi state.

Experimental design

A total of one hundred and eighty (180) 4-weeks-old broiler chicks Arbor Acre strain were weighed and randomly allotted five (5) experimental diets in a completely randomized design (CRD) arrangement. Each treatment of 36 birds had 3 replicates, each having 12 birds were raised on deep litter. Standard management practices were followed. Feed and water were supplied ad-libitum. The experiment lasted for four weeks.

Experimental diets

The experimental diets comprised of T1= maize-based diet without cassava peel meal and enzyme, T2, T3, T4 and T5 = cassava-based diet with 0.01% enzyme at rate of 6% CPM, 12%CPM, 18% CPM and 24% CPM, respectively. The composition of the diets and calculated analysis are shown in Table 1.

Data collection

Growth parameters evaluated include, final body weight (FBW), daily weight gain (DWG), daily feed intake (DFI), feed conversion ratio (FCR) and mortality.

Data analysis

Data obtained on growth were subjected to analysis of variance (ANOVA) using MINITAB statistical software, while means were separated using Fishers' least significant difference (LSD).

Table 1: Composition of experimental diets for finisher broilers fed graded levels CPM with enzyme

Ingredients	Levels of inclusions				
	T_1 (0)	T_2 (6)	T_3 (12)	T_4 (18)	T_5 (24)
Maize	52.00	46.00	40.00	34.50	28.00
Full FAT SBM	34.00	31..00	35.00	35.50	37.00
CPM	0.00	6.00	12.00	18.00	24.00
Maize offal	9.50	9.50	8.50	7.95	6.95
Bone meal	3.15	3.15	3.15	3.15	3.15
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.15	0.15	0.15	0.15	0.15
Methionine	0.25	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25	0.25
Enzyme	0.00	0.01	0.01	0.01	0.01
Total	100	100	100	100	100
Calculated nutrient					
CP	19.32	19.00	19.14	19.00	19.11
ME(Kcal/kg)	3153.68	3071.24	2995.30	2942.86	2915.64

Premix supply/tonne-vit. A, 12,000IU; Vit. D_3 3,000,000IU; Vit. E, 30,000mg; Vit. K_3, 2,500mg; Folic Acid 1,000mg; Niacin, 400,000mg; Pantothenic Acid, 10,000mg; Vit.B2; 5,000mg; Vit. B1, 2,000mg; Vit.B6, 3500mg; Biotic, 80mg; Antioxidant, 125,000mg; Mineral Premix, 1.25kg cobalt, 250mg; Selenium, 250mg; Iodine, 1200mg, Iron, 40,000mg; Manganese, 70,000mg; Copper, 8,000mg; Zinc 160,000mg. ME; Metabolizable Energy

RESULTS AND DISCUSSION

The performance of birds fed diets containing graded levels of CPM is shown in Table 2. All parameters evaluated were significantly different ($P<0.05$). Obtained values of DWG indicated that birds on diets 3 (12% CPM) and 4 (18% CPM) had similar daily weight. Observed values of the growth performance of finisher broiler chickens in this study showed that substitution of maize by CPM supplemented with enzyme in the diet of these birds did not affect their intake negatively. Daily weight gain was not affected adversely because it increased as percent replacement of maize by CPM supplemented with enzyme in the diets increased. Observed weight gain was lower than the range of 40.83g to 41.58g obtained for finisher broiler chicken Arbor acre plus strain fed organic treated diets reported by Ndelekwute *et al*. (2016) and 50.82g to 59.23g for finisher broiler of Ross white strain fed baker's Yeast (*Saccharomyces cerevisiae*) reported by Buba *et al.* (2016).

Table 2: Effect of CPM supplemented with enzyme on performance of finisher broiler chickens

		Levels	of	Inclusions		
Parameters	**T1(0%)**	**T2(6%)**	**T3(12%)**	**T4(18%)**	**T5(24%)**	**SEM**
IW (g)	493.88^{c}	520.00^{c}	536.61^{a}	509.36^{d}	602.01^{b}	10.064
FW (g)	1320.00^{b}	1800.00^{a}	2050.05^{a}	1999.95^{a}	1650.00^{a}	44.462
WG (g)	826.12^{d}	1280.00^{b}	1513.44^{a}	1490.59^{a}	1047.99^{c}	45.882
DWG(g)	29.50^{d}	45.71^{b}	54.05^{a}	53.24^{a}	36.14^{c}	1.428
DFI (g)	52.22^{c}	77.13^{c}	103.36^{a}	104.46^{a}	71.49^{d}	4.531
FCR (g)	1.77^{d}	1.69^{a}	1.91^{b}	1.96^{c}	1.98^{c}	0.073
MORT(%	13.89^{a}	5.56^{b}	2.78^{c}	2.78^{c}	0.00^{d}	0.000

[a,b,c,d,e].. Means with significant superscript on the same row differ significantly (P<0.05), SEM= Standard error of means, CPM= Cassava peel meal, IW = Initial Weight, FW= Final weight, WG=Weight gain.,DWG = Daily, weight gain, DWG = Daily feed intake, FCR = Feed conversion ratio,. Mort = mortality.

But the values of weight gain are similar to the range of 16.31g to 28.51g reported for finisher broiler Arbor acre strain fed cashew pulp meal diets by Oyewole *et al*. (2018). Final body weight of birds was enhanced with a percent increase in substitution of maize by CPM diets supplemented with enzyme. Performance characteristics of the birds in this study seemed to be a reflection of the suitability of the test diets for finisher broiler chickens.

CONCLUSION

The inclusion of cassava peel meal supplemented with enzyme in broiler finisher diets enhance growth performance optimally at 12% than the control. Also, the diets did not affect experimental birds negatively.

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