PERFORMANCE OF STARTER BROILERS FED DIETS CONTAINING GRADED LEVELS OF CASSAVA (*Manihot esculenta*) PEEL MEEL SUPPLEMENTED WITH ENZYME

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ABSTRACT

A 4- week feeding trial was conducted to investigate the performance of starter broilers fed cassava peel meal (CPM) based diets supplemented with multigrain multienzyme. 180 Day Old Chicks Arbor acre strain were randomly allotted to five dietary treatments consisting of three replicates of 12 birds each. Five on- farm diets containing 0 (control), 6, 12, 18, and 24% CPM replacing maize coded as T1, T2, T3, T4, and T5, respectively, were formulated. All parameters measured were significantly different (P<0.05) except mortality. Final weight, daily weight gain, daily feed intake, feed conversion ratio, feed cost/kg and feed cost/kg/gain ranged from 493.47-602.01g, 14-92-18.54g, 36.65-51.62g, 2.33-2.78, 378.95-₦356.68, and 925.66-₦826 64respectively. This study indicated that CPM supplemented with enzyme did not depress performance of starter broiler chicks at 24%CPM replacement. Hence, cassava peel meal supplemented with enzyme is not detrimental to the health of the birds rather enhanced the growth performance of the birds.

Keywords: Cassava peel meal, Starter broiler, Performance, Enzyme

INTRODUCTION

The poultry business has contributed enormously as high as about 25% to the GDP of Nigeria economy as result of quick return due to short generation interval and relatively low capital out-lay (Oyewole *et al*., 2018) which can be raised by average farmers. Poultry meat is tender (Olawumi, 2013) and good quality protein with less saturated fatty acid (36.4 3.6% and a higher amount of polyunsaturated fatty acid (21.33.5%) relative to ruminant beef (53.32.12 t0 3.0 0.5%)) (Jussara *et al*., 2006). Hence, more suitable for human consumption and less prone to cardiovascular disease. In Nigeria, the major energy source in formulating poultry diets is maize which form about 50% of poultry ration (Ajaja *et al*.,2002). Oyewole *et al.* (2013) opined that since poultry has been one of the fastest means by which common man could have meat on his table, daily feed must be given a priority. By this, foreign reserved as money expended on importation of frozen chicken might be avoided. Hence, to realize above objectives, alternative feed ingredient that can substitute maize without undermining the health of animals should be given priority. Many authors had exploited ways to employ agricultural wastes and byproducts such as maize offal, rice bran, wheat bran, banana peel, yam peels and cassava peel, but were found to contain high fibre, low crude protein, poor essential nutrients and low energy. Ndelekwete *et al*. (2020) reported that cassava peel contains appreciable carbohydrate but low crude protein, harmful due to the present of cyanide and higher non-starchy polysaccharide (fibre) especially fresh peel. It has been suggested that processing could reduce cyanide to a tolerant level (Okike *et al.,* 2015). As a result of variance in the results reported by some authors on feeding cassava peel to livestock especially birds, which may attributed to presence of anti-nutritive factors such as fibre, hence, enzyme is now expedient to be exploited to enhance digestibility of nutrients (Onimisi *et al*., 2016) in non- conventional feed ingredients fed to monogastric animals especially poultry. This study was designed to determine the performance of starter broiler chicks fed diets containing graded levels of cassava peel meal diets supplemented with multigrain enzyme as partial replacement for maize.

MATERIALS AND METHODS

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 $7^{o}50^{1}$N of the equator and longitude $6^{o}04^{1}$E of the Greenwich meridian (KCA, 2010). Day old chicks were purchased from reputable farm in Ibadan, enzyme was sourced from Kaduna other feed ingredients were purchased from open market in Kabba. Cassava peel was obtained from Kabba and its environs. The cassava peels were grated and de-watered over night with the aid of locally made hydraulic screw press machine. The grated cassava peels were pulverized and sieved manually using 2.5mm diameter sieve and was sundried for 3 days and included in the experimental diets.

Experimental design

One hundred and eighty (180) day old chicks were distributed randomly into five treatments with three replicates per treatments in a Completely Randomized Design (CRD)

Experimental diets

Five (5) diets of maize replacement with cassava peels plus enzyme at 0, 6. 12, 18 and 24% were coded as T_1 (0% CPM -enzyme) represent the control diet, T_2 (6% CPM+enzyme), T_3 (12% CPM+enzyme), T_4+enzyme, T_5+enzyme (Table1). Multigrain multienzyme was used at rate of 0.01%/100kg feed.

Table1: Composition of experimental diets for starter broilers fed diets containing graded levels of CPM supplemented with enzyme

Ingredients	Level of inclusion of CPM (%)				
	T_1(0)	T_2 (6)	T_3 (12)	T_4 (18)	T_5(24)
Maize	50.70	46.70	40.70	34.70	28.70
SBM	38.25	39.25	36.90	37.00	34.65
CPM	0.00	6.00	12.00	18.00	24.00
Maize offal	7.00	3.00	1.50	0.00	0.00
Blood meal	0.00	0.00	2.55	2.30	3.20
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
Palm oil	0.00	1.00	2.30	3.95	5.40
Enzyme	0.00	0.01	0.01	0.01	0.01
Total	100.00	100.00	100.00	100.00	100.00
Calculated nutrients					
Crude protein	23.08	23.05	23.06	23.05	22.48
Crude fibre	4.06	4.45	4.65	5.00	5.26
ME (Kcal/Kg)	2831.55	2800.31	2796.60	2801.88	2803.70

Data collections

A Standard management practices were carried out. Feed and water were given ad-libitum. The birds were weighed at the beginning of the experiment and at the end of 4 weeks. Performance data collected include daily weight gain, daily feed intake, feed conversion ratio, mortality, cost of 1kg feed, cost of feed/kg, cost of feed/kg gain

Statistical Analysis

All data that were subjected to Analysis of Variance (ANOVA) using MINITAB statistical software (MINITAB, 1991). Where significant means effects were observed, they were separated using Least Significant Difference (LSD) method.

RESULTS AND DISCUSSION

The growth performance of broiler chickens is shown in Table 2. All the parameters measured were significantly ($P<0.05$) different with the exception of mortality. Final weight, daily weight gain, daily feed intake, feed conversion ratio, feed cost/kg and feed cost/kg/gain ranged from 602.01-493.47g, 18.54-14-92g, 51.62g-36.65g, 2.78-2.33, 378.95-₦356.68, 925.66-₦826.64respectively. FBW (602.01g) of the birds on diet 5 (24% CPM) supplemented with enzyme was higher than those birds on diet 1 (0% CPM) FBW (493.47g) and birds on other test diets while FBW were least with birds on control group (493.46g), an indication of poor utilization by birds in this group.

Table2: Effect of cassava peel meal supplemented with enzyme on performance of starter broiler chickens

	Levels	of	Inclusions	of	CPM	
PARAMETERS	T1 (0%)	T2(6%)	T3(12%)	T4(18%)	T5(24%)	SEM
Initial Weight (g)	45.83	44.67	45.93	45.33	45.00	
Final weight(g)	493.47^{e}	520.00^{c}	536.61^{b}	509.36^{d}	602.01^{a}	3.87
Weight gain(g)	447.64^{d}	489.61^{b}	490.67^{b}	464.03^{c}	556.34^{a}	5.78
Daily weight gain/bird (g)	14.92^{d}	16.31^{b}	16.36^{b}	15.46^{c}	18.54^{a}	0.09
Daily feed intake /bird(g)	36.65^{d}	38.04^{c}	43.24^{b}	36.45^{d}	51.62^{a}	0.45
Feed conversion ratio	2.45^{b}	2.33^{a}	2.64^{c}	2.35^{a}	2.78^{d}	0.02
Mortality (%)	0.00	0.00	0.00	0.00	0.00	0.00
Feed cost/kg (₦)	378.95^{d}	376.40^{b}	370.73^{c}	367.13^{b}	356.68^{a}	10.00
Feed Cost/kg gain/bird (₦)	925.66^{a}	812.43^{c}	791.53^{d}	826.64^{b}	826.64^{b}	20.00

$^{a, b, c, d, e}$..Means with different superscript on the same row differ significantly ($P>0.05$),SEM=Standard error of mean. CPM=Cassava peel meal.

Daily weight gain follows the same pattern as FBW. Feed intake for birds on test ingredients exhibited higher DFI, suggesting that the diets were acceptable to the birds, besides being palatable (Oyewole *et al*., 2018).
This result conformed with report of Emmanuel *et al*. (2024), who revealed that cassava peel diets supplementation with enzyme elicit improved growth performance of the birds. This trend may be attributed to influence of the enzyme that degraded the fibre in the feed, hence, enhances digestion, absorption and utilization of nutrients released for the birds. This finding is in agreement with the assertion of Oyewole *et al*. (2013), who posited that cassava peel meal supplemented with enzyme enhances nutrient utilization by the birds. The trend of FCR was best with birds on 6% CPM supplemented with enzyme. This indicated the efficiency of utilization of CPM by birds at that inclusion level. Increasing inclusion levels of CPM in the diets resulted in progressive decreased in the cost of feed is shown in the values for feed cost/kg and feed cost/kg gain. This was attributed to the cheaper cost of CPM relative to maize. Cost of feed/kg gain was best with birds on diet 3 (12% CPM) supplemented with enzyme and worst with those birds the control diet (0% CPM).

CONCLUSION AND RECOMMENDATIONS

Cassava peel meal at 24% CPM supplemented with enzyme gave productive growth potentials to the birds. This may be recommended for broiler chickens at starter phase without undermining the health of the birds and cost effectiveness. Finally, the substitution of cassava peel meal as feedstuff in the diets of poultry should be advocated for reduced feed cost.

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