PERFORMANCE OF BROILER CHICKEN FED DIETS CONTAINING COWPEA MILLING WASTE AND PLANTAIN PEEL MEAL MIXTURE

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Abstract
This study was carried out at the Poultry Unit of the Department of Animal Production Teaching and Research Farm, Federal University of Technology, Minna Nigeria. A total number of 144 day old chicks were used for the study. The birds were randomly allotted into four treatments of three replicates each consisting of 12 birds per replicate in a completely randomized design (CRD) model. The treatments were T_1 (birds fed control diet), T_2 (birds fed 10 % mixture of cowpea milling waste(CMW) and plantain peel meal (PPM)), T_3 (birds fed 20 % CMW & PPM), and T_4 (birds fed 30 % CMW & PPM). The result showed that the feed intake, body weight gained and final body weight were influenced (P>0.05) by the inclusion of mixture of cowpea milling waste and plantain peel meal (CMW & PPM). The results of the total feed intake showed that birds fed on CMW & PPM 0 % (control group) had significantly (P<0.05) higher feed intake of 1023.7g while birds on CMW & PPM 20 % (T_3) had Significantly (P<0.05) lower feed intake of 750.56 g. However, mortality rate was significant at finisher phase. Broiler on T_1 (0 % CMW & PPM) and T_2 (10 % CMW & PPM) had significantly (P<0.05) higher mortality. It was concluded that CMW & PPM mixture in the diets of broiler chicken should not exceed 20 % for optimum growth performance and feed conversion.

Keywords: *Performance, broiler chicken, cowpea milling waste, plantain peel meal*

Introduction

The search for alternative feedstuffs for monogastric animals has challenged animal nutritionists in Nigeria since the past two decades. The search was necessitated by the high cost of the conventional feeding stuffs, which are also in high demand by human beings (Onyimonyi and Okeke, 2008). Feed supply, according to Ameafule *et al.* (2004) has remained a major constraint in animal production due to the ever increasing cost of conventional feedstuffs, due to the competition between man and livestock for cereal grains. Hence, the need to search for alternative feed sources that are cheap, readily available and less competed for by man and industries (Akinmutini, 2004). The need to harness the potentials of the numerous agro industrial by-products and the house hold wastes as part of replacement for the very expensive ones have been advocated (Umoh, 1984). Going by the fundamental role of energy in animal nutrition, it constitutes 35-60 % of rations for different species and classes of livestock. In developing countries, feeding, to a large extent, depends on the availability of the dietary energy source used in compounding concentrate rations for various classes of livestock. Hence, efforts are being made by animal nutritionists to obtain readily available, cheaper but qualitative feedstuffs that can serve as substitutes to the expensive and conventional energy and protein sources.

Materials and Methods

This research study was conducted at the Teaching and Research Farm of the Department of Animal Production, Federal University of Technology, Minna, Gidan Kwanu Campus, Niger State, Nigeria. It is located within latitude 09° 31´ 18.2´´N and longitude 6° 27´ 40´´E with an elevation that ranges from 230-250 m. The area lies within the Southern Guinea Savanna Zone of Nigeria. The sub-humid climate of the region has an average yearly rainfall of 1338 mm, dry season of about five (5) months and average temperature of about 30°C (FUTMIN, 2012). A total of one hundred and forty four (144) day old Ross 308 were sourced from DHAMAS Hatchery Farm Nigeria Limited Ibadan, Oyo State, Nigeria and were used for the study.

A mixture of cowpea milling waste and plantain peel meal were used at 0 %, 10 %, 20 % and 30 % to form treatments T_1, T_2, , T_3 and T_4 respectively. The birds were randomly allotted to the treatment

groups; each treatment was assigned 36 birds and further divided into three replicates of 12 birds per replicate in a completely randomized design (CRD) model. The experiment lasted for eight (8) weeks.

Results and Discussion

At the starter phase, results (Table 1) showed that initial weight, final weight average body weight gain, total body weight and feed conversion ratio were not significantly affected (P>0.05). However, the total feed intake and mortality were significantly (P<0.05).affected. The results of the total feed intake showed that birds fed on CMW & PPM 0 % had significantly (P<0.05) higher feed intake of 1023.7 g while birds on CMW & PPM 20 % (T_3) had significantly (P<0.05) lower feed intake of 750.56 g. There were no significant (P>0.05) differences in total feed intake between birds fed CMW & PPM 10 % and CMW & PPM 30 %. The results obtained from this experiment at the starter phase was in agreement with the results of Hamzat *et al.*(*2*019) who reported that inclusion level of 15 % plantain peel meal in the diet of broiler chicken tends to improve weight gain and FCR Though their research results did not involve inclusion of CMW The results at finisher phase showed that there were no significant differences (P>0.05) in all the parameters measured across the treatment groups.

Table 1: Growth performance of broiler chickens fed diets containing cowpea milling waste and plantain peel meal mixture at the starter phase

Parameters	T_1	T_2	T_3	T_4	SEM	*P-VALUE*
INI WT(g)	64.93	65.30	64.96	64.69	0.50	0.94
FIN WT(g)	459.70	440.73	430.56	463.33	17.40	0.80
TFI(g)	1023.7[a]	838.40[b]	750.56[c]	834.63[b]	43.05	0.13
AFI(g)	36.56[a]	29.94[b]	26.80[c]	29.81[b]	1.53	0.13
TBWG(g)	394.76	375.43	365.60	398.66	17.30	0.84
ABWG(g)	14.10	13.40	13.05	19.69	1.30	0.24
FCR	2.60	2.25	2.05	1.67	0.15	0.22
MOR %	8.33[b]	19.00[a]	0.00[c]	0.00[c]	3.01	0.05

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

T_1 = 0 % Cowpea milling waste and plantain peel meal mixture (Control Diet)
T_2 = 10 % Cowpea milling waste and plantain peel meal mixture
T_3 = 20 % Cowpea milling waste and plantain peel meal mixture
T_4 = 30 % Cowpea milling waste and plantain peel meal mixture

SEM = Standard error of means, P-value= probability value, INI WT = Initial weight, FIN WT = Final weight
AFI = Average feed intake , TBWG = Total body weight gain , ABWG = average body weight gain
FCR = Feed conversion ratio, MOR = Mortality, TFI = Total feed intake.

The result of the finisher phase (Table 2) showed no significant difference (P>0.05) amongst all the parameters measured, except the percentage mortality rate. Mortality rate was significantly (P>0.05) higher at finisher phase. The result from this experiment indicated that the broiler chickens could tolerate high inclusion levels of CMW and PPM with T_3 and T_4 recording the same final weight of 975.00 g and 975.26 g respectively. The result of this experiment agrees with the findings of (Ironkwe *et al*. (2011) who reported that processed CMW and PPM tend to influence positively the growth parameters of broiler chicken without any deleterious effect at starter phase. The best FCR was recorded in T_4 (1.67) although this was not translated into high weight gains. This might be attributed to larger inclusion level of the test ingredient when compared to T_1 (Control) which recorded the highest final weight with high FCR (2.60). This is in agreement with Mmereole *et al.* (2008) who reported that the nature and bioavailability of the nutrients in the test ingredient could affect FCR which ultimately affected growth.

Table 2: Growth performance of broiler chickens fed diets containing cowpea milling waste and plantain peel meal mixture for finisher phase

Parameters	T_1	T_2	T_3	T_4	SEM	*P-VALUE*
INI WT (g)	459.70	440.73	430.56	463.33	22.40	0.80
FIN WT(g)	1013.3	966.80	975.00	975.26	22.58	0.92
TFI (g)	1524.03	1545.43	1205.76	1218.76	69.45	0.13
AFI (g)	54.42	55.18	43.06	43.52	2.48	0.13
TBWG (g)	553.63	526.06	544.43	511.93	28.77	0.89
ABWG/DAY(g)	19.77	18.78	19.44	18.28	1.67	0.89
FCR	2.82	2.94	2.24	2.38	0.14	0.30
MOR %	13.90[a]	19.64[a]	0.00[b]	0.00[b]	3.07	0.02

[ab] Means on the same row bearing different superscripts are significantly different (P < 0.05)
T_1 = 0 % Cowpea milling waste and plantain peel meal mixture (Control Diet)
T_2 = 10 % Cowpea milling waste and plantain peel meal mixture
T_3 = 20 % Cowpea milling waste and plantain peel meal mixture
T_4 = 30 % Cowpea milling waste and plantain peel meal mixture

Conclussion and Recommendations

It was concluded from the experiment that cowpea milling waste and plantain peal meal mixture had effect on the total feed intake and average feed intake. 0 % cowpea milling waste and plantain peel meal mixture had significantly (P<0.05) higher feed intake compared to 20 % CMW & PPM that had significantly (P<0.05) lower feed intake. It was therefore recommended that CMW & PPM mixture in the diets of broiler chicken should not exceed 20 % for optimum growth performance and feed conversion.

References

Akinmutini, A. H. (2004). Effect of cooking periods on the nutrient composition of velvet beans (*Mucuna pruriens*). *Proceedings of the 32nd Annual Conference of the Nigerian Society for Animal Production, held between March 18-21, Calabar, Nigeria*.

Amaefule, K.U., Nwaokono, C. C. and Iheukwumere, F. C. (2004). Effect of feeding graded levels of raw pigeon pea (*Cajanus cajan*) meal on the performance, nutrient retention and carcass characteristics of weaner rabbits. *Nigerian Journal of Animal Production*, 31:194-199.

Hamzat, R.A., Onwumere, C. J., Adeleye, I. O. A. (2019). Evaluation of cowpea waste meal as protein source in broiler chick ration. *ACTA Scientific Nutritional Health, Volume* 3.6:74-77.

Ironkwe, M. O. and Bamgbose, A.M. (2011). Effect of replacing maize with brewer's dried grain in broiler finisher diet. *International Journal of Poultry Science,* 10 (9): 710-712.

Mmereole, F.U.C. (2008). Effects of replacing groundnut cake with rubber seed meal on the haematological and serological indices of broilers. *International Journal of Poultry Science*, 7: 622-624.

Onyimonyi, A. E. and G. C. Okeke, (2008). Nutritional evaluation of cassava (*Mamihot esculenta* Crantz) peels in the diet of weaner pigs. Nigerian Journal of Animal Production, 35: 82-89.

Umoh, J. E (1984). The use of concentrates and by-products in beef cattle production. *Proceedings of the National Conference on Beef Production, July 27-30, Kaduna, Nigeria.*