EFFECT OF BITTER LEAF (*Vernonia amygdalina*) MEAL ON LIVE WEIGHT AND CARCASS OF FINISHER BROILER CHICKENS

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Abstract
An experiment was conducted to determine the effect of bitter leaf meal (BLM) on growth and carcass quality of finisher broilers. one hundred and forty four (144) unsexed Anak strain of broilers were used. There were 4 treatments (T) containing 36 birds each, arranged in completely randomized design (CRD). Each treatment was replicated thrice, each having 12 birds. The birds were fed formulated starter feed containing no BLM for the first 4 weeks. At the beginning of the 5th week, BLM was introduced at the rate of 0.0, 25, 50 and 75g/kg diet representing treatments one (T1), two (T2), three (T3) and four (T4) respectively. This was fed for the next 4 weeks ad libitum including drinking water. At the end of the experiment, 75g/kg gave the highest final live weight, total feed intake and better feed: gain ratio (P<0.05). There were no significant (P>0.05) differences in dressed percentage and cut-parts (breast, thigh, drumstick, wing). All the levels of BLM significantly (P<0.05) reduced abdominal fat. Hence 75g/kg BLM could be recommended for broiler diets at the finisher phase.

Keywords: bitter leaf meal, carcass quality, growth, finisher broilers.

Introduction

Recently leaf meals made from succulent plant leaves have been advocated to be included in broiler feeds as sources of utilizable fibre, starch, vitamins, minerals and to reduce cost of production (Ndelekwute *et al.*, 2014). Feed additives are ingredients added to poultry diets to enhance production efficiency, improve health and reduce morbidity, (FAC, 1998). Feed additives are added to diets for reasons other than to supply nutrients to the animals. They are added in order to improve feed utilization (FAC, 1998). The economic benefit of feed additives is typically to lower production cost as a result of an improvement in production efficiency. *Vernonia amygdalina* known as bitter leaf is a valuable medicinal plant with antimicrobial activity that is widespread in East and West Africa. (Burkill, 1985). Some principal chemical constituents found in bitter leaf herb are steroid glycoside vernonioside B1, which possesses a potent anti-parasitic, anti-tumor and bactericidal effect. (Tadesse *et al.*, 1993).

It has been reported that bitter leaf meal used in poultry production was able to increase feed conversion efficiency of birds without affecting their heamatological profile (Olobatoke and Olonirula, 2009). According to Olobatoke and Olonirula (2009) the bitter leaf was added from the starter phase. Therefore, the objective of this study was to determine the effect of bitter leaf meal fed only at the finisher phase on growth performance and carcass quality of finisher broiler chickens.

Materials and Methods

The experiment was conducted at the poultry unit of Teaching and Research Farm of the University of Uyo, Nigeria. The bitter leaf leaves were harvested from a farm, sun-dried for 7 days. The average ambient temperature was 32°C. Thereafter, the dry leaves were ground into powdery form and stored in a corked plastic container. Four diets representing the treatments (T) were formulated such that T1 contained no bitter leaf meal as the control, T2 had 25g/kg diet, T3 contained 50g/kg and T4= 75g/kg (Table 1).

144 finisher broilers of four weeks old were used. They were raised with the control diet for four weeks marking the starter phase. At the end of the starter phase, the birds were allotted to the four treatments making sure that the average live weights of the treatments were similar. Each treatment had 36 birds replicated three times with equal number of 9 birds per replicate arranged in completely randomized design (CRD). The finisher feed (Table 1) and water were given *ad libitum* for four weeks.

Data Collection and Analysis

Weekly live weight and daily feed intake were recorded and were used to calculate the feed: gain ratio. Carcass analysis was carried out according to Scott *et al.* (1969). The dressed weight was expressed as percentage live weight while cut-parts (breast, thigh, drumstick backcutand wing) were expressed as percentage dressed weight. All

Table 1: Composition of experimental finisher diets containing BLM (g/kgdiet)

Ingredients (%)	T1(0.00)	T2 (25)	T3 (50)	T4(75)
Maize	53.00	53.00	53.00	53.00
Soyabean meal	26.00	26.00	26.00	26.00
Palm kernel cake	15.30	12.80	14.80	14.55
Fish meal	2.00	2.00	2.00	2.00
Bone meal	3.00	3.00	3.00	3.00
BLM	0.00	2.5	5.00	7.5
Salt	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10
Methionine	0.10	0.10	0.10	0.10
*Premix	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Nutrient composition (%)				
Crude protein	20.03	20.03	20.02	20.01
Energy (KcalME/kg)	2850	2847	2844	2842
Ca	1.11	1.11	1.11	1.10
P	0.92	0.92	0.92	0.92

*premix supplied per kg diet: vitamin A 15,000 I.U, vitamin D_3 13000 iu, thiamin 2mg, [illegible] 6mg, pyridoxine 4mg, Niancin 40mg, cobalamine 0.05g, Biotin 0.08mg, chooline chloride 0.05g, Manganese 0.096g, Zinc 0.06g, Iron 0.024g, Copper 0.006g, Iodine 0.014g, Selenium 0.24mg, Cobalt 0.024mg and Antioxidant 0.125g, NFE = Nitrogen free extract.BLM = bitter leaf meal.

Table 2: Effect of bitter leaf meal (g/kg Diet) on growth performance of finisher broilers

Parameters	T1(0.0)	T2(25)	T3(50)	T4(75)	SEM
Initial live weight (g/bird)	800	814	829	838	112.02
Final live weight (g/bir d)	1883^b	1870^b	1873^b	2152^a	155.21
Daily weight gain (g/bird)	38.17^b	38.21^b	37.26^b	46.93^a	5.03
Total feed intake (g/bird)	3752^b	3808^b	3759^b	4009^a	188.05
Daily feed intake (g/bird)	134.00	135.82	134.25	143.18	25.67
Feed gain ratio	3.51^a	3.55^a	3.69^a	3.05^b	0.26

^{ab} means along the same row with different superscripts are significantly ($P<0.05$) different. SEM= Standard Error of the Means.

Table 3: Effect of bitter leaf meal on carcass characteristics of finisher broilers

Parameters	T1(0.0)	T2(25)	T3(50)	T4(75)	SEM
Dressed weight (%)	65.31	66.68	68.00	67.50	10.30
Breast (%)	31.10	29.43	30.40	29.45	6.34
Thing (%)	12.75	12.45	11.49	14.51	4.34
Wing (%)	12.31	12.26	11.71	12.10	3.44
Backcut (%)	21.08	18.49	20.23	20.69	5.14
Abdominal fat	1.44^a	0.20^b	0.10^b	0.05^b	0.56

ab means along the same row with different superscripts are significantly ($P<0.05$) different SEM = Standard Error of the Means.

the data collected were subjected to analysis of variance (ANOVA) and significant means were separated by the method of New Duncan Multiple Range Test (NDMRT) as described by Steel and Torrie (1980).

Results and Discussion

The effects of bitter leaf meal on growth performance of finisher broiler chickens are shown on Table 2. Except the daily feed intake, all the growth indices were significantly ($P<0.05$) influenced. It was observed that the effect of the biter leaf meal on the indices took similar trend with the highest level (75g/kg) giving the best results. Final live weight, daily gain and total feed intake were higher ($P<0.05$) in 75g/kg. The best final live weight produced by 75g/kg could be attributed to the higher total feed intake of the group. Feed gain ratio was lowest ($P<0.05$) in 75g/kg group indicating the ability of the birds to utilize the leaf meal effectively.

The present result indicates that bitter leaf meal is a good leaf material to be included in the diets of finisher broiler chickens. The importance of bitter leaf meal as potential ingredient in poultry feeds have been stressed (*Durunna et al.*, 2011). The result agreed with Tangka (2003). In contrary, Mohammed and Zakariya'u (2012) used higher levels from starter phase and reported no significant difference in live weight and significant reduction in total feed intake. That could be attributed to the higher level of the bitter leaf meal in their diets which would have made the feed unpalatable.

Table 3 shows the effect of bitter leaf meal on carcass quality. There were no significant ($P>0.05$) differences in all the parameters measures. All the levels of bitter leaf meal significantly ($P<0.05$) reduced abdominal fat, thus supporting the report of Nwanjo (2005) that bitter leaf could be used to reduce body fat.

Conclusion

Addition of 75g/kg bitter leaf meal to diets of broilers at the finisher phase positively ($P<0.05$) influenced growth and feed intake and could be adopted.

References

Burkill, H.M. (1985). The Useful Plants of West Tropical Africa. 2nd ed. Royal Botanic Gardens, London, 124-150.

Durunna, C.S., Chiaka, I., Ebenebe, O.E., Udedibie, A.B.I., Uchegbu, M.C. and Durunna, O.N. (2011). Value of bitter leaf (*vernonia amygdalina*) meal as feed ingredient in the diet of finisher broiler chicken. *Intern. J. Agric. and Rural Dev.* 14(2): 722-726.

FAC. (1998). Feed Addtive Compendium. Miler Publishing Co., USA, 56p.

Mohammed, A.A. and Zakariya'u, A.S. (2012). Bitter leaf (*Vernonia amygdalina)* as a feed additive in broiler diets. *Res. J. Anim. Sci.* 6(3):38-41.

Ndelekwute, E.K., Assam, E.D. and Okonkwo, A.C. (2014). Growth performance and carcass yield of finisher broilers fed *Gmelina arborea* leaf meal in partial replacement for palm kernel cake. *J. South Pacific Agric.* 17(1&2): 91-98.

Nwanjo H. U. (2005). "Efficacy of aqueous leaf extract of *vernonia amygdalina* on plasma lipoprotein and oxidative status in diabetic rat models". *Nig. J. Physiol. Sci.* 20 (1-2): 30–42.

Olobatoke, R.Y and Oloniruha, J.A. (2009). Haematological assessment of bitter leaf (*Vernonia amygdalina)* efficiency in reducing infections in cockerels. Proc. World Congress on Medicinal and Aromatic Plants. Cape Town, South Africa, 66-70pp.

Scott, M.L., Hili, N.F., Parson, E.H. and Buckner, J.H. 1969. Studies on duck nutrition. 7: Effect of dietary energy protein relationships upon growth, feed utilization and carcass composition in market ducking. *Poult. Sci.* 38: 497 - 507.

Steel, R.G.D. and Torrie, J.H. 1980. Principles and Procedures of Statistics. McGraw Hill Int. Books Co. Sydney. 155p

Tadesse, A., Gebie-Hiwot, A., Asres, K., Djote, M. and Frommel, D. (1993). The in vitro activity of *Vernonia amygdalina* on *Leishmania aethiopica. Ethiopian Med. J.* 31 : 183-189.

Tangka, J.K. (2003). Analysis of the thermal energy requirements for extraction of leaf protein concentrate from some green plants. *Biosyst. Engineering*. 86 : 473-479.