

EFFECT OF DIETARY INCLUSION OF *ANDROPOGON TECTORUM* LEAF MEAL ON CARCASS AND ORGAN CHARACTERISTICS OF FINISHER BROILER CHICKENS

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Abstract

The low productivity currently recorded in broiler production calls for avenues towards its enhancement. Research was therefore conducted to investigate the carcass and organ characteristics of finisher broiler chickens fed dietary inclusions of *Andropogon tectorum* leaf meal (ATLM). One hundred and twenty Anak-2000 finisher broilers were randomly assigned to four treatments in a completely randomized design (CRD), replicated three times. The experimental diets consisted of ATLM added at levels of 0%, 2.5%, 5% and 7.5% in treatments 1 (control), 2, 3 and 4 respectively. The diets were fed *ad-libitum* for 28 days under deep litter system of management. After which, 3 broilers were randomly selected from each treatment for carcass and organ assessment. The results, expressed as percentage of liveweight, showed no significant difference ($P>0.05$) in all the parameters analysed except back, which had a higher value in the control. It was concluded that since back is not among prime cuts in broiler, the inclusion of ATLM at up to 7.5% rates did not affect the carcass and organ characteristics of finisher broiler chicken and therefore could be adopted in the formulation of finisher broilers diets.

Key words: *Andropogon tectorum*; Carcass; Diet; Finisher broiler chicken; Organs

Description of problem

The low animal protein intake of Nigerians has necessitated for concerted action into avenues to transform the current Nigerian Livestock farming to practices that can enhance livestock productivity. The Nigerian per capita consumption levels of animal protein presently is low, recording 8.7 litres of milk, 9 kg of meat and 45 eggs per year compared to global averages of 44 litres of milk, 19 kg of meat and 180 eggs (1). Feeding cost has been attributed to this gory situation as high cost of feeding has made the cost of production high resulting to unaffordability of animal product by greater percentage of Nigerians to animal products. To solve this problem, there is need to broaden the ingredient base for feeding poultry by discovering alternative ingredients that are cheap in feeding of poultry. The use of leaf meal as alternative feed ingredient is gradually gaining recognition in broiler production. One of the leaves of interest is *Andropogon tectorum* commonly called Silver Bluestem grass or

southern gamba grass. The grass is a tropical species that is widely distributed in Nigeria and has been reported to have potential as a feed ingredient (2). The leaf meal of Silver bluestem has been shown to contain crude protein ranging from 3.5% to 5.23% (3). This nutritional quality makes it an attractive option for animal feed. Feeding however, has been reported to exert immense influences on the development of carcass, organs and muscles in broilers (4). The breast muscle of broilers is a vital part of carcass quality and has the highest significant economic impact in broiler value (5) while examination of organs like the liver gives an insight into the toxicity level of the diet to which the birds were fed as enlarged liver has been attributed to high toxicity level of diet consumed by the bird during its life time (6). Different leaves type possesses different components (7) hence could impact differently on broiler meat traits. The present research therefore explored the effect of dietary inclusion of *Andropogon tectorum* leaf meal on

the carcass and organ characteristics of finisher broiler chickens.

Materials and Methods

The research was conducted at the Teaching and Research Farm, Department of Animal Health and Production Technology, Akanu Ibiam Federal Polytechnic, Unwana, Afikpo, Ebonyi State. Unwana is in the tropical rain forest zone of Nigeria.

Collection and preparation of the Andropogon Tectorum leaf

The *Andropogon tectorum* grass used for the study was harvested before the flowering stage from the Pasture unit of Akanu Ibiam Polytechnic Unwana. The harvested grass was chopped into pieces and oven dried. The dried leaves were ground to obtain the *Andropogon tectorum* leaf meal (ATLM). The sample was analyzed according to (8), to obtain its chemical composition. The ATLM was used to substitute Brewers dried grain at different levels.

Experimental Birds and Design

A total of 120 Anak 2000 breed of finisher broiler of 28 days post hatch were used for the research. The broilers were randomly assigned to four (4) treatment groups in a complete randomized design (CRD) and replicated 3 times. The groups were T₁ which was the control group, T₂, T₃ and T₄. The groups were assigned to an experimental unit of 1m by 1m each and raised in a deep litter system. Feed and water were given *ad-libitum* for 28 days and proper bio-security measures strictly followed.

Experimental Diets, data collection and analyses

Four experimental diets were formulated for this research. Diet T₁ was the control which contained 0% ATLM, in diets T₂, T₃ and T₄, ATLM partly replaced brewer's dried grain and was added at 2.5%, 5.00% and 7.5% inclusion rates respectively. The percentage ingredient and the calculated nutrient composition of the experimental diets are shown in Table 1.

Table 1. Ingredient and calculated nutrient composition of the experimental diets

Ingredients	Treatment levels (%)			
	T ₁ (0.0ATLM)	T ₂ (2.5ATLM)	T ₃ (5.0ATLM)	T ₄ (7.5ATLM)
Maize	60.00	60.00	60.00	60.00
GNC	10.00	10.00	10.00	10.00
Soya bean meal	5.00	5.00	5.00	5.00
Brewers dried grain	10.00	7.50	5.00	2.50
AT Leaf meal	0.00	2.50	5.00	7.50
Palm kernel cake	5.00	5.00	5.00	5.00
Fish meal	3.00	3.00	3.00	3.00
Blood meal	2.00	2.00	2.00	2.00
Bone meal	4.00	4.00	4.00	4.00
*Min-vit premix	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25
Common salt	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00
Calculated nutrient composition of the diets				
Crude protein (%)	19.27	18.79	18.24	17.73
Crude fibre (%)	4.12	4.51	4.90	5.28
Calcium (%)	1.62	1.62	1.63	1.89
Crude fat (%)	4.83	4.68	4.51	4.36
**Met. Energy (kcal/kg)	2963	2915.17	2867.51	2819.86

*To provide the following per kilogram of feed, vit A 10,000 IU; Vit D₃ 1,500 IU, Vit E 2mg; riboflavin 3mg; pantothenic acid 10mg; nicotinic acid, 2.5mg; choline 3.5mg; folic acid 1mg; magnesium 56g; lysine 1mg; iron 20mg; zinc 50mg; cobalt 1.25mg.

**Calculated using the formular $ME = 37 \times cp + 81.8 \times EE + 35.5 \times NFE$ (where ME= metabolizable energy, CP= crude protein, EE=ether Extract and NFE =Nitrogen free extract) (9).

Data collection

At the end of the 28 days feeding, 3 broilers were randomly selected from each of the

replicates for carcass and organ assessment. The broilers were starved for 12 hours prior to slaughter while water was provided. The

broilers were weighed using sensitive digitalize weighing scale to obtain their liveweight and then slaughtered by severing the jugular vein with a sharp knife. The carcass and organs were dressed, eviscerated, cut into parts and weighed. The weights obtained were expressed as a percentage of the liveweight. Data obtained were subjected to analysis of variance (ANOVA). Treatment means were compared using Duncan Multiple Range test at an α -level of 0.05% significant level.

Results and Discussion

Carcass characteristics

The result of the carcass characteristics of the broilers as presented in table 2 showed that there was no significant difference in all the parameters analysed except back in which the control had higher value than the broilers fed the test ingredient. The back is not among carcass of value in broilers (5). The similarity of the broilers fed the test ingredient with the control in all other parameters of carcass characteristics, is an indication that inclusion of *Andropogon tectorum* leaf meal at up to 7.5% to the diet of finisher broilers did not impact on the carcass traits of the broilers. The result conforms with assertion of (10).

Table 2 Carcass characteristics of finisher broilers fed graded levels of *Andropogon tectorum* leaf meal

Parameters	Treatment levels (%)				SEM
	T ₁ (0.0ATLM)	T ₂ (2.5ATLM)	T ₃ (5.0ATLM)	T ₄ (7.5ATLLM)	
Live wt (g)	1637.00	1883.00	1356.00	1929.00	438.03
Dressed wt (%lw)	93.64	89.29	87.70	87.43	4.14
Eviscerated wt (%lw)	80.43	79.40	79.65	79.12	5.66
Breast muscle (%lw)	17.55	20.61	21.17	21.59	1.94
Thigh & D (%lw)	20.12	20.51	20.97	20.37	1.67
Wing (%lw)	11.12	10.42	10.29	9.34	0.79
Head & Neck (%lw)	9.09	8.81	8.64	8.38	0.40
Shank (%lw)	4.73	4.46	4.50	4.05	0.46
Back (%lw)	14.31 ^a	11.24 ^b	11.75 ^b	10.39 ^b	0.88
Vent	3.86	3.80	4.03	3.70	0.50

Note: Without superscript = not significant ($P < 0.05$). Means on the same row with different super script differ significantly. SEM = Standard error means. Wt = weight, %lw = percentage of live weight Thigh and D = Thigh and Drumstick.

Organ characteristics

The result of the organ characteristics as presented in Table 3 also showed no significant effect. This is an indication that the leaf meal at up to 7.5% inclusion rate did not depress the organs of the

Broiler. The liver which is an organ for detoxification was not enlarged. Enlarged liver of birds has been attributed to consumption of diet that is toxic (Ayhan, 2017). The present finding could be evidence that the diets were non-toxic to the broilers.

Table 3. Organ characteristics of finisher broilers fed graded levels of *ATLM*

Parameters	Treatment levels (%)				SEM
	T ₁ (0.0ATLM)	T ₂ (2.5ATLM)	T ₃ (5.0ATLM)	T ₄ (7.5ATLM)	
Heart (%lw)	0.50	0.47	0.51	0.53	0.09
Gizzard (%lw)	4.51	4.21	4.11	4.00	0.51
Liver & gallbladder (%lw)	2.54	2.51	2.37	2.26	0.23

Note: Without superscript = not significant ($P < 0.05$). Means on the same row with different super script differ significantly. SEM = Standard error means. Wt = weight, %lw = percentage of live weight.

Conclusion and application

Based on the findings of the present study, it was concluded that:

1. Inclusion of *Andropogon tectorum* leaf meal at up to 7.5% in the diet of broilers did not affect the carcass and organ of the broiler chickens.
2. *Andropogon tectorum* leaf meal can be added in diet of finisher broilers at up to 7.5%.

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