

EFFECT OF FEEDING OVEN-DRIED *Canarium schweinfurthii* SEED MEAL ON CARCASS CHARACTERISTICS OF BROILER CHICKEN

*Adelowo, O.V¹., Christy Agbi², Aka-Tanimbo, H.A¹., Banjo, A.A²

¹Department of Animal Production, Federal College of Animal Health and Production Technology, N.V.R.I., Vom, Plateau State

²Chemistry and Biochemistry Laboratory, Federal College of Animal Health and Production Technology, N.V.R.I., Vom, Plateau State

*Corresponding author: olufisayo71@gmail.com (08030426283)

ABSTRACT

A feeding trial of six weeks duration was conducted to determine the performance and carcass characteristics of broiler chickens fed with oven dried *Canarium schweinfurthii* seed meal (ODCSM). Four dietary treatments containing 0% (control), 2.5%, 5%, and 7.5% of oven dried *Canarium* seed meal (ODCSM) respectively. One hundred and twenty (120) day old chicks were randomly allotted to four experimental diet, at thirty (30) per treatment in a completely randomised design. The parameters measured were live weight, bled weight, carcass weight, breast weight, thigh weight, drumstick weight, wings weight, neck weight, back weight, spleen weight, gizzard weight, liver weight, heart weight, lungs weight, abdominal fat weight. The results shows no significant difference in all the parameters measured across the treatments. Therefore, Oven dried *Canarium schweinfurthii* seed meal can be included in the diets of broilers chickens up to 7.5%.

Key word: Oven dried, *Canarium schweinfurthii*, Carcass characteristics, Broiler chickens

INTRODUCTION

Poultry meat is a rich source of high quality protein, minerals and vitamins (Adelowo *et al.*, 2019a). Due to economic importance attached to chicken and their products gives rise to the need for food safety which is imperative in food production worldwide (Chisoro, 2015). Poultry production, especially broiler chickens remains one of the veritable ways of attaining sustainable and rapid production of high quality protein to meet the increasing demand of the Nigeria teeming populace, due to short generation interval of broiler chicken (Akinmutimi, 2004). One of the main challenges in poultry enterprise is high cost of feed which is estimated to be about 70% of the total cost of production (Ogundipe *et al.*, 2003). This high cost has been attributed to the over-dependence on the expensive conventional feed stuffs such as soybean and groundnut cake which is mainly used in poultry feed formulation (Apata and Ojo, 2002). A high demand for these feed ingredients has resulted in an increase in their prices and consequently, cost of poultry feeds and its products, this calls for a serious attention with regard to the quality of chicken meat available (Chisoro2015). This necessitates research into non-conventional feedstuffs (NCF) that are readily available, cheap and nutritionally safe such as *Canarium schweinfurthii* seed meal. *Canarium schweinfurthii* seed contained natural flavors, high fat content, pigments, moisture, nutritionally valuable minerals, vitamins and naturally occurring antioxidants (Ayoade, *et al.*, 2015). The seed also contains appreciable amount of nutritionally valuable minerals such as calcium, potassium, magnesium, sodium, phosphorous, iron, zinc and copper. Glutamic and aspartic acids dominated the amino acid profile of *Canarium schweinfurthii* seed, it contained appreciable amount of essential amino acids which is more than fifty percent of total amino acid contents (Ayoade *et al.*, 2017, Adelowo *et al.*, 2019a). One of the major problems of legume utilization is the presence of anti-nutritional factors (Oke *et al.*, 2004). Removal of these anti-nutritive components is essential in order to improve the nutritional quality of the seeds and to effectively utilize their full potential as feeds (Akinmutimi, 2004). Heat treatment such as boiling, frying and drying are frequently used to improve the utilization of the nutrients in legumes by animals (Shaahu *et al.*, 2015). This study is therefore aimed at studying carcass characteristics of broiler chickens fed with oven dried *Canarium schweinfurthii* (ODCSM) seed meal.

MATERIALS AND METHODS

The experiment was carried out at the Teaching and Research farm of the National Veterinary Research Institute (NVRI) Vom, Nigeria. Vom is located in Jos south local government area of plateau state. It is situated on the south east of Jos, the Plateau state capital which is located at 8°45

East and 90°43 North with a height of about 1,285 meters above sea level. Vom has a remarkable cool climate, in December and January; the night may be extremely cold, the wet season from late April to middle October.

Experimental Birds and their Management

In a completely randomised design a total of 120 unsexed two weeks old broiler chicks were used for the study. The chicks were randomly allotted into four (4) dietary treatments containing 0% (control), 2.5%, 5% and 7.5% of oven dried *Canarium schweifurthii* seed meal, with each treatment having three (3) replicates of ten (10) birds each. The feed was presented in mash form and water was provided *ad libitum*. The birds were raised on deep litter and were subjected to standard management and hygiene the recommended vaccines for broilers were administered accordingly. At the end of the six weeks feeding trials, two birds from each replicate were randomly selected, fasted for (12) hours and slaughtered by severing the throat with the aid of sharp knife. The birds were allowed to bleed for five minutes and defeathered manually by immersing in warm water. The parameters measured were the live weight, bled weight, carcass weight, breast weight, thigh weight, drumstick weight, wings weight, neck weight, back weight, spleen weight, gizzard weight, liver weight, heart weight, lungs weight, abdominal fat weight

Determination of carcass characteristics was done according to the method described by Oluyemi and Robert (2002). The feathers were plucked and eviscerated to determine the dressed weight and weight of the carcass components (thighs, drumstick, breast, back, wings, and neck. The internal organs were; heart, lung, liver, gizzard, spleen, abdominal fat) were measured. The Carcass, organs, and gut were weighed with the aid of laboratory electronic scale (ACCULAB). The cut parts were expressed as percentage of live weight. The dressing percentage was calculated as a ratio of dress weight to live weight multiplied by hundred

$$\text{Dressing percentage} = \frac{\text{dress weight}}{\text{live weight}} \times 100$$

Data Analysis

Data obtained from the experiment were analysed using the statistical analysis of variance (ANOVA) procedure of SAS (2010) and significant level of $p=0.05$ was used. The treatment means were compared using the New Duncan multiple range test option of the same software.

Table 1: Composition of the experimental diet

Ingredient	0%	2.5%	5%	7.5%
Maize	59.00	57.39	57.39	55.00
Soybean cake	19.00	18.50	16.00	15.89
G. cake	19.39	19.00	19.00	19.00
ODCSM	0	2.50	5.00	7.50
Bone meal	2.00	2.00	2.00	2.00
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
Premix	0.16	0.16	0.16	0.16
Salt	0.25	0.25	0.25	0.25
Total	100	100	100	100
Nutrient Analysis %				
CP%	22.61	22.06	21.04	20.75
Energy	3023.14	2944.76	2877.04	2793.03
Calcium	0.79	0.79	0.78	0.78
Av phosphorus	0.50	0.49	0.48	0.48
Lysine	0.09	1.07	1.00	0.99
Methionine	0.42	0.42	0.40	0.40
Fibre	3.38	3.30	3.14	3.08

G.cake-Groundnut cake, C.P-crude protein, Av-available phosphorus

Table 2: Carcass characteristics of broiler finisher fed graded levels of oven dried *Canarium schweinfurthii* seed meal (ODCSM)

Parameters	0%	2.5%	5%	7.5%
Live weight	1.78 ±0.03	1.83±0.02	1.76±0.06	1.68±0.03
Carcass weight	1.68± 0.03	1.70±0.10	1.65±0.05	1.55±0.05
CarcassComponent % of live weight				
Dressing %	1.25±0.05	1.30±0.01	1.18±0.03	1.13±0.03
Breast	0.35±0.05	0.28±0.02	0.38±0.02	0.29±0.02
Thigh	0.18±0.03	0.16±0.01	0.16±0.01	0.18±0.03
Drumstick	0.15±0.01	0.15±0.01	0.15±0.02	0.14±0.01
Wings	0.13±0.03	0.12±0.01	0.13±0.03	1.15±0.01
Neck	0.95±0.05	0.90±0.10	1.00±0.10	1.00±0.20
Back	0.14±0.02	0.16±0.01	0.19±0.01	0.18±0.02
Internal organs gible				
Spleen	1.50±0.50	2.00±1.10	2.00±0.10	3.00±0.10
Gizzard	31.00±2.00	40.00±1.00	43.50±4.50	42.50±1.50
Liver	33.50±0.50	33.50±1.50	33.00±6.00	34.00±4.00
Heart	9.50±1.50	9.00±1.00	9.50±1.50	11.00±2.00
Lungs	13.50±1.50	9.50±1.50	10.50±1.50	8.50±0.50
Abdominal fat	18.50±12.5	12.00±5.00	11.50±3.50	12.00±6.00

RESULTS AND DISCUSSION

The carcass characteristics of broiler finisher fed graded level of oven dried *Canarium schweinfurthii* seed meal were not significantly different ($P>0.05$) across the treatments, this result agrees with the findings of Adelowo *et al.*, (2019b) that broiler chickens can tolerate roasted *Canarium schweinfurthii* seed meal up to 7.5% without affecting their performance. The live weight of the birds fed with 2.5% has the highest value of 1.83±0.02kg although, there was no significant variation in the values statistically across the treatments with the birds fed at 0% (1.78±0.03), 5% (1.76±0.06), and 7.5% (1.68±0.03) at $P>0.05$ respectively. The bled weight of the birds fed with 2.5% is 1.70±0.10 kg while those fed at 0% (1.68±0.03), 5% (1.65±0.05) and 7.5% (1.55±0.05) respectively also at $P>0.05$. The carcass weights of the birds are 2.5% (1.30±0.01), 0% (1.25±0.05), 5% (1.18±0.03), and 7.5% (1.13±0.03) respectively. The breast weight of the birds are 5% (0.38±0.02), 0% (0.35±0.05), 2.5% (0.28±0.02), and 7.5% (0.29±0.02) respectively at $P>0.05$. Oven dried *Canarium schweinfurthii* seed meal can be included in broiler diet at all stages because the seed contained appreciable amount of nutritionally valuable minerals such as calcium, potassium, magnesium, sodium, phosphorous, iron, zinc and copper while glutamic and aspartic acids dominated the amino acid profile, also appreciable amount of essential amino acids which was more than fifty percent of total amino acid contents (Aigade *et al.* (2017). The parameters measured were not statistically different at $P>0.05$, Although the values obtained at 2.5% inclusion levels was higher than control and 7.5% inclusion level but once the statistical analysis shows no difference therefore any of the inclusion level can be fed to the birds. This result agrees with the findings of Adelowo *et al.*, (2019b) on the inclusion of roasted *Canarium* seed meal to 7.5% without affecting the performance of the broiler chickens.

CONCLUSION

Based on the result obtained, where there was no significant variation across the treatments, the seed can therefore be added to the diets of broiler chickens at any of the inclusion level without having a detrimental effect on the carcass of the birds.

REFERENCES

- Adelowo, O. V., Oshibanjo, D. O. and Tangshwan, L. S. (2019a). Proximate Composition of Raw-Dried and Heat Treated *Canarium schweinfurthii* (Atili) Fruit as Non-Convention Ingredient in Broiler Diet. *Proceedings Nigeria Society for Animal Production* 44th Annual Conference Abuja 2019. Page 284-287. ISSN: 1596-5570
- Adelowo, O.V., Oshibanjo, D.O., and Gowel, D.P (2019b). Effects of Feeding Roasted *Canarium schweinfurthii* Seed Meal on Performance of Broiler Chickens. *Proceedings of the 8th ASAN-NIAS Joint Annual Meeting*, Umuahia. 2019 Pg: 638-641. ISSN-9783477722
- Aigade, G. W1, Amoo, I. A1, Jabar, J.M1, Ojo A.M and Maduawuchi, C.O. (2017). Proximate, Minerals and Amino Acid Profile of (*CanariumSchweinfurthii*) Seed Pulp. *International Journal of Science and Technology* Volume 6 No. 1
- Akinmutimi, A. H. (2004). Effect of cooking periods on the nutrient composition of *Mucuna utilis* seeds. *Nigeria Poultry Science Journal*. 2 and 3: 45-51.
- Ayoade, G. W1, Amoo, I. A1, Jabar, J.M1, Ojo A.M and Maduawuchi, C.O Proximate, Minerals and Amino Acid Profile of (*CanariumSchweinfurthii*) Seed Pulp. (2017). *International Journal of Science and Technology* Volume 6 No. 1
- Ayoade, G.W., I.A. Amoo and Gbolahan-Ayoade, E.E. (2015a). Phytochemical Composition and AntioxidativePotential of Purple Canary (*Canariumschweinfurthii*) Fruit.*The Pharma Innovation Journal*, 4(1): 49-52
- Chisoro, P. (2015). Department of Livestock and Pasture Science, Faculty of Science and Agriculture, University of Fort Hare.
- Oluyemi, J.A. and Roberts, F.A. (2002). Poultry production in the warm, wet climate. 2nd edition. Spectrum Books Ltd. Ibadan, Nigeria.
- Ogundipe, S. O., Abeke, F. O; Sekoni, A.A., Dafwang, I.I., and Adeyinka, A. I. (2003). Effect of duration of cooking in the utilization of lab lab purpureus by pullet chicks. In; *Processing of the 28th Annual conference of the Nigerian*, 233-235.
- Oke, U.K., Ibe, S.N. and Ogbnnaya, E.O. (2004). Effect of genotype on growth traits of rabbits. *Int. J. Agric. Rural Dev.*, 5: 61-68.
- SAS. 2010. SAS/STAT User's Guide: Version 9.2. SAS Institute Inc., Cary. NC., USA; 2010.
- Shaahu, D.T., Tuleun, C.D., Gbue, F.H. and Shittu, H.A. (2015). Nutritive value and economic benefit of boiled velvet beans (*Mucunautilis*) in rabbits diet. *Proceedings of the 38th Nigerian Society for Animal Production-NAPRI*, Ahmadu Bello University, (eds) Adeyinka I.A., Kabir, M. Abdu, S.B., Erakpotobor, G.I., Hassan, M.R. and Iyiola-Tunji, A.O. Zaria. March 15th-19th, 2015.