

CARCASS CHARACTERISTICS OF BROILER CHICKENS FED ACHA HUSK AS REPLACEMENT FOR WHEAT OFFAL

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ABSTRACT

The study was conducted to evaluate the carcass traits of broiler chickens fed acha husk in place of wheat offal. Five different varying levels of acha husk were used in formulating the diets. The design used for the experiment was a completely randomized design. Birds were managed under the deep litter system for a period of 6 weeks. At the end of the experiment, four birds were randomly selected from each treatment for carcass evaluation. The values obtained were subjected to statistical analysis and the results showed that there were significant differences ($p>0.05$) in some of the parameters such as eviscerated weight, gizzard, liver, heart and spleen where birds on the acha husk base diets did better than the control diet. However, no significant differences were noted in the lungs, small intestine and large intestine of broiler birds under different treatments of acha husk. It was therefore concluded that using acha husk in place of wheat offal in broiler chickens' diets at 24.20% level produced broilers of better carcass traits compared to that fed wheat offal under conventional commercial feeds ($p>0.05$)

Keywords: Broiler chickens, acha husk, wheat offal, carcass

INTRODUCTION

Global consumption of poultry products (meat & eggs) has consistently increased over the years and this trend is expected to continue (Dale, 2009). The increase in the world population, high cost of conventional animal feed ingredients and low protein intake in most of the developing countries has necessitated animal scientists to search for alternative sources of feed ingredients (Medugu *et al.* 2011). The demand is higher in developing countries and such growth in poultry industry is having a profound effect on the demand for feed and raw materials. Corn and soybean meal are the major ingredients of poultry feed. The cost of virtually all feed ingredients like maize, soybean meal, Di-calcium phosphate, fat and even vitamins has gone beyond exception (Dale, 2009). Due to the ever increasing demand and less supply of raw feed ingredients, cost of feed production has increased. Alternatives for energy and protein sources in poultry diets will be an important means to meet future feed requirement and minimize the cost of feed production. Use of locally available raw feed ingredients like jowar, wheat, barley etc. is now getting importance. Thus, in order to reduce the cost of feed production without affecting the performance of poultry birds, the use of alternative feed sources is gaining importance. A wide range of alternative feedstuffs like jowar, wheat, barley etc. are available for feeding all three poultry production systems. Similarly, in most households and locations, several by-products from cereal milling are available for animal feeding, including bran, hulls and screenings. Despite their high fiber contents, these can be valuable source of energy. Economic quantities, price and nutritive value are the most important criteria to determine the use of a feedstuff in commercial poultry diets. Presently, various alternative protein sources are used like green materials, industrial by-products, animal and fish by-products, insects etc. Similarly, energy sources can be replaced by jowar, wheat, barley and rice. The energy sources are chiefly used at levels of about 50-70% and incidental to their inclusion at these levels, they contribute about 1/4 - 1/3 of the total protein requirement of poultry (Medugu *et al.* 2011).

MATERIAL AND METHODS

The study was conducted in Jos, Plateau State. Plateau State is located in Nigeria's middle belt. With an area of 26,899 square kilometers, the State has an estimated population of about three million people. It is located between latitude 08°24'N and longitude 008°32' and 010°38' east. Two hundred day old chicks of mixed sexes were used for the experiment. The chicks were raised/ brooded on deep litter management system for a period of one week. During the brooding, all the necessary management practices were strictly adhered to as appropriate. After the brooding, the chicks were then allocated to the various experimental treatments. The birds were provided with a known quantity of feed. Water was also provided *ad libitum*. The birds were vaccinated appropriately.

The design used for the experiment was a completely randomized design (CRD). The two hundred birds were randomly allocated to five different treatments (table 1) with forty (40) birds per treatment

and each treatment was replicated three times with thirteen birds per replicate. The experiment lasted for a period of eight (8) weeks.

The ingredients for diet formulation were maize, wheat offal, soya bean, cabbage leaves, bone meal, premix, lysine, calcium, methionine and salt with cabbage leaves serving as the test ingredient. Experimental diet was formulated to meet protein and energy requirement of broiler chickens table 1

RESULTS AND DISCUSSION

The result on dressed weight was not significantly different among the treatment mean values but numerically higher in birds fed diet 5. Birds fed Diet 5 had the highest live weight per bird. This observation therefore implied that the dressed weight of chicken may not necessarily be directly proportional to the performance traits. A high weight gain value does not imply a concomitant increase in dressed weight as a percent of live weight (Fasuyi, 2000). The percentages of the eviscerated weight were significantly higher ($p < 0.05$) in birds fed diet 5 than those fed the control diet but similar to those fed diet 3 and 4. The result indicated that the diets promoted the development of identical eviscerated weight percent. The values for eviscerated weight in this study ranged from 73.77 – 77.07 % which surpassed the normal range of 65 – 70 % reported for broiler chicken (Oluyemi and Robberts, 1999). Organs are body parts, composed of several types of tissues, capable of carrying out specialized function. The weight of organs in broilers according to Atteh, 2004 reflects the anatomical response of birds to the type of diet consumed. The relative organs weight measured in this study were comparable in all the dietary treatments. Though there were significant differences ($P < 0.05$) in the values obtained for heart, gizzard, liver and spleen. The chickens fed the control diet had similar values with acha husk base diet, suggesting that the diets were not detrimental even though the husks may have contained some anti-nutritional factors. The presences of anti-nutritional factors have been associated with abnormal enlargement of organs such as liver and pancreas due to detoxifying activities (Adeyemi, 2003). The significant variation among the treatment mean values of heart, liver, gizzard and spleen follow a particular pattern in relationship with the dietary treatments. It could generally be surmised that the control diet and the test diets enhanced identical organ development. The values obtained for organs weights were in agreement with the finding of Oforjindu, (2006).

Table 1: Ingredients and Composition (%) of the Experimental Diet

Ingredients	T1	T2	T3	T4	T5
Maize	40	38.00	38.00	36.00	36.00
Soyabean cake	36.00	30.00	30.00	32.00	32.00
Acha husk	0.00	6.05	12.20	18.15	24.20
Wheat offal	18.20	18.15	12.20	6.05	0.00
Fish meal	2.00	4.00	4.00	4.00	4.00
Bone meal	2.50	2.50	2.50	2.50	2.50
Lime stone	0.50	0.50	0.50	0.50	0.50
Lysine	0.15	0.10	0.10	0.10	0.10
Methionine	0.10	0.15	0.15	0.15	0.15
Salt	0.30	0.30	0.30	0.30	0.30
Premix	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100

Table 2: Carcass Characteristics of Broiler Chickens Fed Varying Levels of Acha Husk

Parameters	T1	T2	T3	T4	T5	SEM
Live weight (kg)	2.30	2.35	2.55	2.56	2.57	0.02 ^{NS}
Dress weight (%)	86.67	86.68	86.70	87.01	87.50	0.12 ^{NS}
Eviscerated weight (%)	73.77	74.78	75.88	76.57	77.07	0.96*
Gizzard (%)	12.52	12.49	13.66	14.44	14.48	0.65*
Liver (%)	14.01	14.57	14.83	15.29	15.35	0.79*
Heart (%)	3.08 ^c	3.63 ^{bc}	3.87 ^b	3.99 ^b	4.10 ^a	0.29*
Spleen (%)	0.87 ^c	1.05 ^b	1.14 ^{ab}	1.11 ^{ab}	1.25 ^a	0.79*
Lungs (%)	3.63	3.65	3.62	3.64	3.59	0.20 ^{NS}
Small intestine (cm)	254.32	255.01	255.35	255.48	255.58	0.10 ^{NS}
Large intestine (cm)	28.98	28.99	29.05	29.11	29.25	1.27 ^{NS}

abc: means within the same row bearing different superscripts are significantly different (P<0.05)

*: level of significance

NS: Non significant difference

REFERENCES

- Adeyemi, F. A. (2003). Effect of enzyme supplemented cassava root sievet (CRS) in cassava based diets on some visceral organs of pullet chicks. In: *Proceedings of the 8th Annual Conference of Animal Science Association of Nigeria*. September 16-18, 2003, Federal University of Technology, Minna. Pp. 25-27
- Dale, A. M (2009). Use of Whole Pearl Millet in Broiler Diets. *Journal of Applied Poultry Research*. **13**:20-25.
- Fasuyi, A. O. (2000). Biochemical, Nutrition and Socio-Economic Aspects of Cassava Leaf Utilization. PhD Thesis, The Federal University of Technology, Akure, Nigeria. Pp 56
- Groen, A.F., Jiang, X., Emmerson, D.A and Vereijken, A. (1998). A deterministic model for the economic evaluation of broiler production systems. *Poultry science* **77**(7): 925-933
- Medugu, C. I., Kwari, I D., Igwebuike, J., Nkama, I., Mohammed, I.D and Hamaker, B (2011) Carcass and blood components of broiler chickens fed sorghum or millet as replacement for maize in the semi-arid zone of Nigeria Agricultural Biology. *Journal of Nutrition America* **1** (3): 326-329.
- Oforjindu, O. (2006). The toxicity of graded levels of neem (*Azadirachta indica*) leaf meal. B. Agricultural Technology Project Report, Federal University of Technology, Owerri, Nigeria. Pp 36.
- Oluyemi J. A. and F.A Roberts(1999). Poultry production in warm weather climate. Macmillart press, London. Pp. 31.