ISSN NO: 978-34777-2-2

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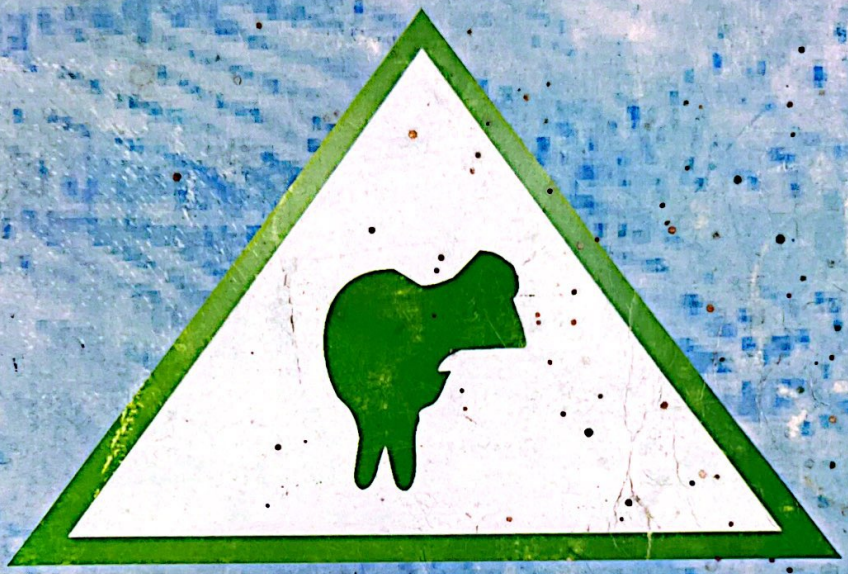
NEW CHALLENGE IN ANIMAL PRODUCTION: THE WAY FORWARD



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Proceedings of 11th Annual Conference of
ANIMAL SCIENCE ASSOCIATION OF NIGERIA
18TH - 21ST SEPTEMBER, 2006
INSTITUTE OF AGRICULTURAL RESEARCH & TRAINING,
IBADAN.

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Performance Of Pullets Fed Activated Charcoal Supplemented Diets

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Introduction

The development of the poultry industry in Nigeria has been slowed down by a number of constraints, among which is inadequate supply of feed raw materials. Thus, the production of poultry meat and egg, as well as the number of practicing poultry farmers have reduced drastically in recent times. Farmers' efforts are frustrated by high cost of feed ingredients. The success of any livestock venture largely depends on feeding, it therefore becomes imperative to find cheap, but valuable alternative feeding materials or ingredients to the conventional ones.

Poultry like, other animals need feed for the maintenance of their body and for productions. Different types of feed and additives are used to feed animals depending on availability and local conditions. Some of these ingredients are not cited in the scientific literature, but are used locally. One of such applications includes the use of wood charcoal in poultry diet. Kutlu (2000) indicated that local poultry producers in Turkey claimed that 20-50g wood (oak) charcoal /Kg prevent fatness and improved performance of layers. Feltwell and Fox, (1978). Observed that charcoal has great power of absorption, and in the past has often been recommended as a treatment for scouring. These report did not indicate if the observe properties are peculiar to oak charcoal or are general to charcoal from all trees.

This work was therefore designed to study and determine the effect of shea butter charcoal on the performance of pullets at chicks and grower's stages and also examine egg quality characteristics of the pullets.

Materials and Methods

One hundred and fifty day Old pullet chicks (Isa Brown Strain) were used for this experiment. The pullets were randomly distributed into five treatment groups of two replicates each. The pullets were weighed on arrival and subsequently average weekly weights were recorded. Drinking water and feed were provided constantly. Brooding temperature was maintained at about 32.2-35^{0}c, for the first, second and third week of brooding. The birds were raised on deep litter system and litter materials were wood shaving.

Experimental diets: About 100kg of charcoal (shea butter ash) was taken and divided into 5 parts of 0,10,20, 30 and 40kg respectively, representing 0.0, 10.0, 20.0, 30.0 and 40%, and then incorporated into 5 different diets, such that, 0.0% charcoal was the control. The chicks trial lasted for 8wks, and the grower's feeding lasted for another 8 wks.

Chemical analysis was conducted on the samples of the charcoal chicks and growers mash using A.O.A.C. (1990) methods. The results are shown in Table1.

Results And Discussion

No significant (P> 0.05) differences were observed in the performance characteristics of the pullet chicks in terms of weekly body weight, feed intake, feed conversion efficiency and protein efficiency ratio among the different treatment groups (Table 2). In Table 3, no significant (P>0.05) differences were observed in most of the treatment groups for the performance characteristics

studied at the grower's stage. However, there is a significant ($P<0.05$) difference in feed conversion efficiency among the treatment groups. Diet T_2 (10.0%) charcoal significantly ($P<0.05$) improved the feed conversion efficiency of the pullets compared to other groups.
The results in Table 4 indicate that significant differences ($P<0.0$) were observed in average weekly egg weight and the percentage cracked eggs. High proportion of dietary charcoal (40.0%) significantly ($P<0.05$) increased egg weight compared to the control diet. Percentage cracked eggs was also reduced significantly ($P<0.05$) by 40% charcoal compared to the control and 10.0% charcoal. These results were attributed to high ask content of the charcoal supplemented diets since the diets contained more minerals than the control.

Conclusion

The birds with higher percentage (30 &40%) charcoal performed better than those of other treatment groups in terms of average egg weight and headless percentage of creaked eggs.
It is therefore recommended that:-
Farmers intending to produce poultry eggs with low percentage cracked eggs and with high improvement in the egg weight should feed their pullets with 30-40% charcoal diets.

References

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Kuhu, H.R. (2000). Feed science and Technology 90 (2001) 213- 226.

Table 1: Proximate composition of the experimental diets(%)

Charcoal Free Concentration	Dry Matter	Ash	Ether Extract	Crude Protein	Crude Fibre	Nitrogen Extract
Chick Mash						
0.0	91.60	7.23	8.99	24.5	1.99	48.69
10.0	91.01	8.84	7.46	23.37	7.46	43.88
20.0	91.28	9.45	6.19	23.33	6.96	45.45
30.0	92.26	10.34	5.96	23.90	5.83	46.93
40.0	91.84	12.48	4.83	24.00	5.99	44.54
Growers Mash						
0.0	92.24	7.45	10.09	14.06	6.87	52.77
10.0	91.73	8.79	8.50	13.37	4.17	57.90
20.0	9.98	8.77	9.10	12.40	4.28	57.42
30.0	9.97	8.01	8.68	13.45	4.08	57.74
40.0	91.84	8.24	8.02	13.11	5.03	57.44

Layers diet						
0.0	89.55	9.16	16.10	24.15	6.50	49.74
10.0	89.75	30.45	15.17	16.40	8.12	34.78
20.0	93.35	15.51	13.99	18.61	5.80	53.43
30.0	89.65	8.41	14.81	25.70	15.49	40.05
40.0	91.68	12.65	15.01	21.60	15.17	7.26

Charcoal			
Dry matter	**Ash**	**Crude Fibre**	**Crude protein**
90.96	**1.55**	**6.87**	**2.39**

* Shea butter tree wood charcoal

Table 2: Performance Characteristics of Pullet chicks fed charcoal supplemented diets Dietary Charcoal Levels %

Parameters	0.00	10.00	20.00	30.00	40.00	SEM.
Average wkly body wt (g)	264.38	264.19	258.21	260.52	261.60	+26.08
Average wkly feed intake (g)	190.00	190.63	200.6	207.25	208.20	+15.76
Average wkly body gain (g)	60.40	60.40	61.79	62.14	62.28	+18.42
Feed conversion efficiency	2.65	2.73	2.99	3.13	3.14	+0.12
Protein efficiency ratio	1.73	1.74	1.64	1.54	1.43	+0.11

The parameters above are not significantly ($p>0.05$) different

Table 3: Performance Characteristics of growing Pullets fed activated charcoal supplemented diets. Dietary Charcoal Levels %

Parameters	0.00	10.00	20.00	30.00	40.00	SEM
Ave. wkly body wt (g)	741.31^a	741.28^a	740.80^a	736.83^a	744.15^a	±21.26
Ave. wkly Body wet gain(g)	52.45^a	52.50^a	51.13^a	51.25^a	51.25^a	±12.26
Ave. wkly feed Intake (g)	486.63^a	486.84^a	496.06^a	503.88^a	504.03^a	±11.74
Feed conversion efficiency	4.99^b	3.38^b	5.09^b	5.23^b	5.11^b	±1.45
Protein efficiency ratio	1.28^a	1.18^a	1,18^a	1.25^a	1.25^a	±0.06

Means denoted by the same alphabet in the same row are not significantly different ($P> 0.05$)

Table 4: External egg quality characteristics, of laying pullets fed activated charcoal supplemented diets.

Dietary Charcoal Levels % Parameters	0.00	10.00	20.00	30.00	40.00	SEM
Ave. wkly Egg weights (g)	48.93^{a}	51.00^{a}	50.88^{ab}	53.46^{ab}	54.86^{b}	±9.01
Ave. wkly egg Length (mm)	5.25^{a}	5.38^{a}	5.34^{a}	5.48^{a}	5.44^{a}	±0.03
Percentage Cracked Eggs(%)	15.33^{c}	9.96^{bc}	5.18^{ab}	1.40^{a}	0.20^{a}	±0.41
Ave. wkly egg Circumference (Cm)	4.15^{a}	4.36^{a}	4.20^{a}	4.13^{a}	4.09^{a}	±0.03
Ave. egg Shell Thickness (g)	0.42^{a}	0.41^{a}	0.45^{a}	0.44^{a}	0.45^{a}	±0.009
Ave. wkly egg shell wt (g)	5.29^{a}	5.50^{a}	4.95^{a}	4.96^{a}	7.76^{a}	±0.49

Means donated b the same alphabet in the same row are not significantly different (P>0.05)