

RESPONSE OF STARTER BROILER BIRDS FED DIFFERENT COMMERCIAL FEED

Ohagenyi, I.J., Onah, C.S. and Udeh, V. C.

Department of Animal Science, University of Nigeria, Nsukka, Nigeria.

Correspondence email: ifemma.ohagenyi@unn.edu.ng; Tel: +2348160516532

ABSTRACT

This study was conducted to compare the performance of broilers fed with different commercial feeds at the starter phase. A total of 200 birds were used for the experiment which lasted for 8 weeks. The birds were randomly divided into 5 treatment groups which were assigned to the 5 experimental diets. The experimental design used was completely Randomized Design (CRD). Growth performance parameters were measured weekly and feed intake measured daily. Feed conversion ratio and cost per kilogram weight gain were also determined. Data collected were subjected to analysis of variance (ANOVA) and separated using DMRT. The result indicated that the final body weight of broiler chicks fed the various commercial starter diets range from 683g in treatment D to 876g in Trt E. The daily weight gain of broiler starter ranges from 21.36 in birds fed with Trt D to 28.25 for bird fed with Trt E. The feed intake (FI) of commercial broiler fed with Trt A, B, C, D and E were 94.7g, 91.3g, 81.0g and 99.0 respectively. The feed conversion ratio (FCR) of birds in the five treatments were similar ($p>0.05$). This implies that commercial feeds are better utilized. The result showed that diet B has the lowest cost (N124/kg), while E had the highest cost (N156/kg) at the start phase. From the economic point of view, it seems that diet E would increase production cost for the poultry meat producer considering that feeding is known to take up to 70% production cost in livestock production.

Keywords: Starter, broiler, Commercial feed, response, cost

INTRODUCTION

The poultry industry has been the most dynamic sector within the global meat business since the last decade, with an increased production driven by global population growth especially in developing countries (Delgado 2005). The high demand for animal products in Nigeria coupled with her teeming population, an increasing number of people are venturing into the poultry business. Consequently, this has led to high demand for commercial feed. There is now the tendency for feed manufacturers to produce substandard feeds, especially as the quality control agencies in Nigeria are non-existent or non-functional (Okoli *et al.*, 2007; Omede, 2008., Okoli, *et al.*, 2009), hence, leaving farmers and consumers at the mercy of commercial feed millers.

Poultry feeds are expected to contain a certain level of protein and energy for proper growth and development in birds. However, the feeds offered to birds constitute varied mixtures of ingredient. Moreso, the tendency of feed producer to maximize profit, might contribute to differences in the quality of the manufactured feeds sold in the market. It is important, therefore, to ensure that quality commercial feeds with proven nutritional value capable of achieving efficient production performance are patronized by the farmers. Hence, this study was conducted to compare the performance of the broilers fed different commercial feeds and to evaluate the economic implication of using these feeds.

MATERIALS AND METHODS

Location and duration of study

This study was conducted at the poultry unit of the Department of Animal Science Teaching and research farm, University of Nigeria, Nsukka in Enugu state. Nsukka is located on latitude 05° 22' north and longitude 07° 24' east with annual rainfall ranging from 986-2098mm (Asadu, 2002). The climate of the study area is typically tropical, with relative humidity ranging from 65 – 80% and mean daily temperature of 26.8°C (Agbagha *et al.*, 2000). The rainy season is between April and October while dry season is between November and March with annual rainfall range of 1680 – 1700mm (Breinholt *et al.*, 1981). The study lasted for 8 weeks.

Experimental birds and management

A total of 200 broiler day-old chicks from a commercial farm at Ibadan were procured for the experiment. The birds were randomly divided into 5 treatment groups. Each bird in the group served

as replicate. The five groups were assigned to different experimental diets TA, TB, TC, TD, and TE. There was no control diet. The birds were housed in a deep litter system and subjected to the same experimental and management conditions. Water and feed were given ad-libitum. Feed and water intake were recorded daily while body weight (BW) measurement was also taken on a weekly basis.

Experimental materials and diets

The experimental diets were different commercial broiler feeds produced by different feed manufacturing companies in Nigeria. These feed were bought from their various distributors in Nsukka in Enugu State, Nigeria. The study involved the use of five commercial feeds TA, TB, TC, TD and TE of the starter diet. The composition of diets is given in the table below.

Data collection

Data were collected on daily feed intake, weekly body weight, weekly body length and shank length, daily water intake, feed conversion ratio and rearing phase mortality of the birds.

$$\text{FCR (feed: gain)} = \frac{\text{feed consumed}}{\text{Weight gain}}$$

Experimental Design

The feed trial experiment was carried out in a completely randomized design (CRD) with five treatments. The statistical model was as follows:

$$X_{ijk} = \mu_1 + T_j + E_{ijk}$$

Where X_{ijk} = the record of body weight, body length and shank length of individual broiler

μ_1 = overall mean

T_1 = the random effect of various feeds

E_{ijk} = the error

Statistical Analysis

Data collected were subjected to analysis of variance (ANOVA) in completely randomized design using a statistical package to social science (SPSS 2007). Significant difference among mean was separated using Duncan's New Multiple Range Test (DNMRT) as outlined by Obi (2000).

RESULTS AND DISCUSSION

Table 1: Proximate composition of experimental diets.

Treatment	Moisture	Ash	Fat	Crude protein	Crude fibre	M.E (Kal/kg)
A	8.150	3.100	6.00	18.00	5.00	3200.00
B	12.000	7.000	8.00	15.00	15.00	2600.00
C	10.000	5.100	3.80	19.60	5.00	3100.00
D	7.130	3.100	3.00	18.50	4.00	3100.00
E	8.150	3.247	3.247	19.264	2.986	3100.00

ME = Metabolizable energy

Table 2: Performance of Starter Broiler Fed with Different Commercial Diet

Parameter\ Treatments	A	B	C	D	E	SEM
Initial body weight (g)	85.00	85.00	85.00	85.00	85.00	3.46
Final body weight (g)	747.0	710.0	700.0	683.0	876.0	124.5
Daily weight (g/day)	23.64 ^b	22.32 ^b	21.96 ^b	21.36 ^b	28.25 ^a	2.30
Daily feed intake (g/day)	94.7 ^{NS}	90.7 ^{NS}	91.3 ^{NS}	81.0 ^{NS}	99.0 ^{NS}	5.73
Feed conversion ratio (g/feed, g/gain)	2.661 ^{NS}	2.682 ^{NS}	2.740 ^{NS}	2.490 ^{NS}	2.373 ^{NS}	0.15
Mortality (Number of deaths)	3.0	3.0	2.0	3.0	1.0	0.00
Feed cost (₦/kg)	136	124	128	136	156	2.20
Feed cost /kg weight gain (₦)	544.81	503.89	532.17	515.73	546.69	6.48

^{ab}Means within a row with different superscript are significantly ($p < 0.05$) different.

The performance of starter broilers fed with different commercial feed is presented in Table 2.

This result indicated that the final body weight of commercial birds fed with treatment A, B, C, D, and E was 747g, 710g, 700g, 683g and 876 respectively. The final body weight gain for commercial

starter broiler ranges from 683g among birds in Trt D to 876g among birds in Trt E which was not in agreement with Uchegbu *et al.* (2009). It may be due to the problem of disease that affected my birds during the course of the study.

Daily Weight Gain: The daily weight gain of broiler starter was 23.64, 22.32, 21.96, 21.36 and 28.25 respectively. It ranges from 21.36 among birds fed with Trt D to 28.25 for bird fed with Trt E. The commercial broilers fed with Trt E at the starter phase recorded significantly ($p < 0.05$) higher daily weight than birds in Trt A, B, C and D. This result is in agreement with report of Uchegbu *et al.* (2009).

Feed Intake: The result of this study shows that the feed intake of commercial broilers fed with Trt A, Trt B, Trt C, Trt D and Trt E at 8 weeks of age were 1.32, 1.31, 0.97, 1.23 and 1.36 respectively. The result further revealed that the feed intake (F.I) of broiler birds fed with different commercial feed is not significant ($p > 0.05$). At the starter phase, the feed intake (F.I) of commercial broiler fed with Trt A, B, C D and E were 94.7g, 91.3g, 81.0g and 99.0 respectively. The feed intake was similar in Trt A, B, C and E ($p > 0.05$) but significantly ($p < 0.05$) higher than those on treatment D. The low feed intake of birds on treatment D relative to those on treatment A, B, C and E might have resulted from metabolizable energy requirement (Leason and Caston, 1993). It has also been reported that birds overeat under moderate protein insufficiency which is not necessary a craving for protein insufficiency but a compensatory increase in feed intake in response to the deficient essential nutrients (Lipstein and Bronstein, 1975).

Feed conversion ratio: The result of this study revealed that the feed conversion ratio (F.C.R) of commercial broilers fed with Trt A, Trt B, Trt C, Trt D and Trt E was 5.19, 5.31, 3.61, 5.47 and 4.93 respectively. It also revealed that the FCR of commercial broiler fed with Trt A, Trt B, Trt C, Trt D and Trt E is not significant ($p > 0.05$). At the starter phase, the FCR of commercial broiler fed with Trt A, B, C, D and E were 2.661, 2.682, 2.740, 2.940 and 2.373 respectively. F.C.R ranges from 2.373 (Trt E) to 2.740 (Trt C). The FCR ranges from 2.373 (Trt E) to 2.740 (Trt C). The FCR of birds in these five treatment are similar ($p > 0.05$). It was in agreement with the report of Martin *et al.* (2009). This implies that commercial feeds are better utilized. This may have resulted from the likelihood that the manufacturers used better and utilizable feed raw materials for compounding their feeds.

Feed Cost: The study pointed out that in the starter phase the feed cost per diet A, B, C, D and E were N136/kg, N124/kg, N128/kg, N136/kg and N156/kg respectively. The result shows that diet B has the lowest cost, while E had the highest cost at the start phase. From the economic point of view, it seems that diet E would increase production cost for the poultry meat producer considering that feeding is known to take up to 70% production cost in livestock production.

Mortality: Mortality records in treatment A, B, C, D and E were 6, 3, 3, 2 and 1 respectively. The study showed that Trt A had the highest mortality, while Trt E had the least. High mortality in Trt A could be due to infected feedstuff or poor quality of feedstuff.

CONCLUSION AND RECOMMENDATION

The response of birds to body weight and daily weight gain were highest in Trt E while Trt B was poorest from the result in terms of feed utilization. Trt B was the cheapest of the five commercial feed while treatment E was the costliest in terms of the cost of feed used to produce 1kg of broiler meat. Variability in the nutrient contents of commercial feeds appeared to be an important factor that resulted in the performance differences in this study.

The farmer who depends on commercial feeds and who want his birds to reach market weight at the shortest possible time and at a lower cost of production should consider treatment B, C, and D feed.

REFERENCES

- Agbagha, F.M., Ezema F.U. and Omeke, B.C.O. (2000) Studies of management effects on fertility of purbred and crossbred exotic gilts in two breeding farms at Nsukka. *Nigeria Journal of Animal Production*. 28(1)Pg 20.
- Asadu, C.L.A. (2002). Fluctuations in the characteristics of an important short tropical season, august break in eastern Nigeria, discovery and innovation 14(1/2).IITA England.
- Breinholt, K.A., Gowen, F.A. and Nwosu, C.C. (1981). Influence of Environmental and Animal Factors on Day and Night Grazing Activity of Imported Holstein Freisian Cows in the Humid Lowland Tropics of Nigeria. *Trop. Animal Produc*.6:4.
- Delgado, C. (2005). Rising demand for meat and milk in developing countries: implication of grassland-based livestock production in Grassland: a global resources (ed.MC Gilloway D.A. editor), pp. 29-39 the nature lands: wagen-ingen Academic publishers.
- Kumar, P., Ali, N., Rajkumar, Kumar, J., Bansala, M. K. and Kumar, P.1 (2015).Effect of different dietary protein level on the growth performance of broiler chickens. *Progressive Research - An International Journal* 10 (2): 157-15.
- Leson, S. and Caston. L. J. (1993). Production and carcass yield of broiler using free-choice cereal feeding *Journal of applied poultry research* 2:253-258.
- Lipstein, B. and Bronstein, S. (1975) The replacement of soybeen meal by the limiting amino acid in practical broiler diet 2 special additions of methionine and lysine as partial substitute for protein in finder diet. *Brit. Poult. Sci.*,16: 189-00.
- Obi, I.U. (2000). Statistical methods of detecting differences between treatment means. SNAAP Press Ltd. Enugu Nigeria pp.45.
- Okoli IC, Omede AA, Ogbuewu IP, Ekwuagana IC, Ndujihe GE and Emeka J (2007). Prevalence of Salmonella in commercial poultry feeds and feed raw materials sold in Imo State, Nigeria. In: S.O. Oseni., O.Makinde., A. Fafiolu., and O. Betiku (eds). Book of Abstracts, 12th Annual Conference of Animal Science Association of Nigeria, 10th - 13th Sept., 2007 Obafemi Awolowo University, Ile-ife, Osun State, Nigeria. Pp: 114.
- Okoli, I.C. Owede, A.A., Ogbuewu, J.P. and Uchegbu, M.C. (2009). Physical characteristics as indicator of poultry feed quality. A Review proceeding of the 3rd Nigerian International Poultry summit, S.I. Ola., A.D Fafiohu and AA Fatufe (editors) (A Review. Publication). February 22-26 Abeokuta, Ogun state, Nigeria pp. 124-128.
- Omede AA (2008). Critical Issues in Poultry Feed Quality Evaluation in Nigeria. Book of Abstracts and Congress Proceedings, XXIII World's Poultry Congress, Volume 64, supplement 2, pp455. 29th June-4th July, 2008, Brisbane, Australia.
- SPSS. (2007). SPSS 16.0.1 for Windows. SPSS Inc., Chicago, IL, USA.
- Uchegbu, M. C., Irechukwu, N. M., Omede, A. A., Nwaodu, C. H., Anyanwu, G. A., Okoli, I. C. and Udedibie, A. B. I. (2009) Comparative Evaluation of Three Commercial feeds on the performance of Broilers. *Report and Opinion* 1(4)