

PERFORMANCE AND CARCASS EVALUATION OF BROILER CHICKENS FED DIFFERENT COMMERCIAL DIETS

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Abstract

An experiment was carried out to determine the performance and carcass indices of broiler chickens fed five selected commercial diets. Three hundred day-old chicks were randomly allotted to five diets, A, B, C, D, E in replicates of three containing 20 birds each in a completely randomized design. Feed and water were supplied *ad libitum* and the trial lasted for six weeks. Results for performance showed no significant ($P>0.05$) influence of diet on final weight which ranged from 1695.96g on diet D to 1884.49g on diet B., total weight gain from 1546.95g – 1729.41g on diets D and B respectively. However, daily feed was higher ($P<0.05$) on diets A (103.00g), D (101.79g), E (100.18g) and B (96.06g) which were the same and lower on C (85.21g). Daily weight gain was significantly higher ($P<0.05$) in birds fed diets B (47.70g), A (47.01g) and E (45.77g) which were the same and similar to those on diet D (42.67g). Birds on diet C (38.69g) had lower daily weight gain which was comparable to those on D. Feed conversion ratio was better on diet B (2.03) which compared favourably with those on other diets (2.14 – 2.38) except those on C (2.42) which had a poorer value of FCR. Carcass evaluation showed that diet D gave the highest ($P<0.05$) dressing percentage (76.72 %). It was therefore concluded that diet D, is nutritional more balanced and hence recommended for broiler chicken farmers.

Key words: Broiler, Performance, Commercial feeds, Carcass indices.

INTRODUCTION

In poultry production enterprise, feed is the major determinant of profit as it accounts for 60 -80% of the total cost of production (Amaza *et al.*, (2020). The productivity of birds depends not only on quantity the quantity of feed but the quality as well (Oluyemi and Roberts, 2013). Against this backdrop, there is need to always pay utmost attention to the quality of feeds that poultry farmers use in feeding their birds. At present, majority of poultry farmers, especially those that operate at small scale level, rely on feed millers for their feed supply (Onigemo *et al.*, 2020). The demand factor, partly occasioned by the increasing number of people venturing into the business in Nigeria, has made some poultry feed manufacturers to produce sub-standard products, especially as the quality control agencies in Nigeria are not playing effectively their statutory roles (Okoli *et al.*, 2009). Ordinarily, poultry feeds, based on type of birds, purpose and stage of growth produced by different companies are supposed to be similar in composition in order to meet the birds' requirements. However, considering the selfish tendencies of feed producers to maximize profit and that of some quality control agents to enrich themselves at the detriment of the poor farmer, sub-standard commercial feeds are bound to be found in the Nigerian markets (Jones, 2005). Consequently, a time-to-time sampling and analysis of available poultry feeds sold in the market need to made in order to augment the quality assurance measures being taken by statutory bodies in the country. Against this background, this study was therefore designed to evaluate the performance and carcass indices of broiler chickens fed commercial broiler feeds sold in Bauchi metropolis.

MATERIALS AND METHODS

Study Area

The experiment was conducted at the Teaching and Research Farm, Abubakar. Tafawa Balewa University, ATBU, Bauchi. Nigeria

Experimental Design and Management of Birds

Three hundred day-old chicks were brooded for two weeks and thereafter allotted to five different commercial diets designated as A, B, C, D and E in replicates of 3 containing 20 birds each. The Design was a completely randomized one. Feed and water were served *ad libitum* and the study lasted for 6 weeks.

Data Collection

Data was collected for final weight, total weight gain, daily feed intake (DFI), daily weight gain (DWG) feed conversion ratio (FCR) and mortality. Daily feed intake was obtained by difference between quantity of feed offered and the left-over retrieved the following morning. Weight gain was determined by the difference between two consecutive weighing carried out on weekly basis. This value was divided by 7 to obtain DFI while FCR was the value obtained when DFI was divided by DWG.

At the end of the 6 weeks period, three (3) birds were randomly selected from each replicate for carcass analysis. The birds were starved of feed for 12 hours after which they weighed individually, slaughtered, plucked and eviscerated. Dressing percentage was determined using the relationship:

$$\text{Dressing \%} = \frac{\text{Carcass weight}}{\text{Live weight}} \times 100$$

Data Analysis

Data were subjected to One Way Analysis of Variance (ANOVA) using IBM SPSS statistics 25 for windows (SPSS, 2017). Means were separated through the Duncan Multiple Range Test of the same software, at $P < 0.05$ level of significance.

RESULTS AND DISCUSSION

Results for growth performance of broiler chickens fed commercial diets is presented in Table 1. All the three parameters; daily feed intake, daily weight gain and feed conversion ratio, were significantly ($P < 0.05$) affected. (this confirms an earlier report by Hafiz *et al.* (2020). There was however, no significant difference in final weight (1695.97 – 18884g) and total weight gain of birds (1546.95 – 1729.41g) of birds. Final weight of birds in the present study is higher than (772.70 – 1730g) obtained within the same length of study reported by Muazu *et al.* (2020) using different commercial diets. Daily feed intake was higher ($P < 0.05$) and the same on diets A (103.00g), D (101.79g), E (100.18g) and B (96.06g) but lower on diet C (85.21g). Daily weight gain was lower on diet C (38.69g) and higher on diets B (47.70g), A (47.01g) and E (45.77g) which were the same and comparable with diet D (42.67g). However, diet D did not differ from diet C. Feed conversion ratio of birds fed diet B (2.03) was better ($P < 0.05$) and comparable with diet A (2.14), E (2.19) and D (2.38), while those fed diet C (2.42) had the poorest which was similar to diets A, C and E. these values are within the range of 2.06 – 2.51 reported by Yisa *et al.* (2020). Overall mortality of 1 and 2 birds respectively, were recorded on diets B and C.

Table 1: Performance of Broiler Chickens Fed Different Commercial Feeds (3 – 8 weeks).

Parameter	Diet					SEM
	A	B	C	D	E	
Initial weight (g)	155.09	155.08	154.04	149.02	152.94	2.06 ^{NS}
Final weight (g)	1783.00	1884.49	1752.51	1695.97	1835.84	69.39 ^{NS}
Total weight gain (g)	1627.91	1729.41	1598.47	1546.95	1682.9	65.08 ^{NS}
Daily feed intake (g)	103.00 ^a	96.06 ^a	85.21 ^b	101.79 ^a	100.18 ^a	2.39*
Daily weight gain (g)	47.01 ^a	47.70 ^a	38.69 ^b	42.67 ^{ab}	45.77 ^a	1.93*
Feed conversion ratio	2.14 ^{ab}	2.03 ^a	2.42 ^b	2.38 ^{ab}	2.19 ^{ab}	0.11*

Mortality (No.) 0 1 2 0 0 -

a,b Means within row with different superscripts differed significantly ($P < 0.05$), SEM = Standard Error of the Mean, NS = Not significant

The results for carcass characteristics of broiler chickens fed different commercial diets is presented in Table 2. Most of the parameters studied showed a significant ($P < 0.05$) influence of diet. This denotes a high variability in the nutrients content of the commercial diets. Live weight of birds (1637.83 – 1938.67g) did not differ among diets. Carcass weight was highest ($P < 0.5$) on diet D (1462.83g) followed by diet E (1403.17g) and A (1210.33g) which are similar to diets B (1293.17g) C (1150.83g). Dressing percentage was higher ($P < 0.05$) in birds fed diet D (76.72%) which are similar to those on diet A (73.53%). Birds on diet C (67.96%) had the lowest ($P < 0.05$) dressing percentage. These values are comparable with 65.70 – 70.77% recommended by Salami *et al.* (2004) for well-dressed broiler chickens. The values obtained in this study are also comparable with 61.52 – 74.52% reported by Bello *et al.* (2022) in broiler chickens fed different commercial diets.

Table 2: Carcass Characteristics of Broiler Chickens Fed Different Commercial Diets

Parameter	Diet					SEM
	A	B	C	D	E	
Live weight (kg)	1637.83	1839.83	1691.83	1909.00	1938.67	119.89 ^{NS}
Plucked weight (kg)	1519.00	1699.50	1567.17	1768.33	1780.83	108.62 ^{NS}
Eviscerated weight (kg)	1371.50 ^{bc}	1423.50 ^{abc}	1269.83 ^c	1642.83 ^a	1546.00 ^{ab}	81.63 [*]
Carcass weight (kg)	1210.33 ^{bc}	1293.17 ^{abc}	1150.83 ^c	1462.50 ^a	1403.17 ^{bc}	76.04 [*]
Dressing percentage	73.53 ^{ab}	70.37 ^{bc}	67.96 ^c	76.72 ^a	72.24 ^b	1.18 [*]

a,b Means within row with different superscripts differed significantly ($P < 0.05$), SEM = Standard Error of the Mean, NS = Not significant.

Conclusion and Recommendation

Based on the findings of this study, broiler chickens fed different brands of commercial feeds had similar total weight gains and final weight. However, based on dressing percentage of birds diet D, which gave the highest value is hereby recommended for poultry farmers in Bauchi metropolis.

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