PERFORMANCE AND ECONOMICS OF PRODUCTION OF BROILER CHICKENS FED DIFFERENT COMMERCIAL DIETS

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ABSTRACT
An experiment was conducted to evaluate the response of broiler chickens to five different commercial diets. Two hundred and fifty day-old chicks were randomly allotted to five diets in replicates of three containing 16 birds each in a completely randomized design. Feed and water were supplied *ad libitum* and the feeding trial lasted for 42 days. Results for performance showed that at 4 weeks, birds on diet B had significantly (P<0.05) higher weight (2129.69g) than those on the other diets. Feed conversion ratio was also better (P<0.05) on birds fed diet B (1.35) than those fed other diets. A similar trend was observed for final weight, with birds on diet B recording the highest (P<0.05) mean weight of (2660.38g) compared to those on other diets (1792.37 – 2114.33g). Feed cost per kg was similar and higher on diets B and E (₦158.00). However, feed cost per kg body weight gain was lowest on diet B (₦306.01) and higheron dietE (₦441.63). It was therefore concluded that diet B gave better performance at reduced feed cost, hence recommended for broiler chicken producers.

Keywords: Broiler chickens, Commercial diets, Performance, Economics of production

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Introduction

In addition to its ability to bridge the protein deficiency gap which exists among average Nigerian families, Poultry production can also provide job opportunities in the areas of commercial feed production and retail, hotel/restaurant industry, sales of roasted chickens carriage and transport of feed ingredients, finished feed, live and dressed birds (Afzal and Khan, 2019). However, the success of any poultry enterprise rests squarely on adequate and proper nutrition. Accordingly, poultry diets are formulated to provide specific levels of nutrients that are needed for optimum performance (Oluyemi and Roberts, 2013). Feed cost alone was reported to stand at about 75% of the total cost of broiler chicken production (Alagawany *et al.*, 2018). Against this background, a focus on efficient feed utilization in order to maximize profits and avoid loses becomes a necessity.

Due to inadequate knowledge of feed formulation techniques and weak capital base, several poultry farmers prefer to buy commercial feeds rather compounding their own. This has made the demand and cost for commercial feeds to be relatively high (Malebogo *et al.*, 2016). The demand factor, partly occasioned by the increasing number of people venturing into poultry 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 some 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). It is therefore the aim of this study to evaluate some of the commercial broiler feeds sold in Bauchi metropolis.

Materials and methods

The experiment was carried out at the Poultry Teaching and Research Farm, College of Agriculture, Bauchi, Bauchi State. Five selected commercial broiler starter and finisher feeds were purchased from feed vendors in Bauchi town. Two hundred and fifty day-old broiler chicks were randomly allotted to five different commercial diets, designated as A, B, C, D and E in replicates of 3 of containing 16

birds each in a completely randomized design. Recommended vaccinations were administered accordingly. Similarly, all routine sanitary operations were carried out during the study period lasted for 6 weeks of 4 and 2 weeks starter and finisher phases respectively. Data was collected for feed intake, weight gain and feed conversion ratio. Prices of feeds, total feed intake and total weight gain were the indices used in computing the economics of production. All data obtained was subjected to analysis of variance (Steel and Torrie, 1980). The statistical software employed was SPSS v. 23.0. mean seperation was according to Duncan Mutiple Range Test (Duncan, 1955).

Results and Discussion

Result of performance of broiler chickens fed different commercial diets during the starter phase is presented in Table 1. Initial weight of birds, which did not differ among diets ranged between 131.25 – 132.87g. Weight of broiler chickens at week 4 was significantly (P<0.05) influenced. Birds on diet B (2129.69g) had higher average weight than those on other diets (1480.38 – 1618.82g) which were similar. This agrees with Sogunle *et al.,* (2009). Daily feed intake (DFI) which ranged from 84.12 to 96.00g, was not significantly affected. However, daily weight gain (DWG) followed the same trend with week 4 weight. Birds on diet B (71.34g) gained higher (P<0.05) than those on other diets (48.12 – 53.10g) which did not differ. Feed conversion ratio (FCR) was also significantly (P<0.05) better on diet B (1.35) than on other diets (1.69 – 1.85).

The result of broiler chickens performance at the finisher phase is presented in Table 2. During the finisher segment, final weight of birds reveled that those on diet B (2660.38) outweighed (P<0.05) those fed other diets (1792.37 – 2114.33g) which were the same. Daily feed intake (124.08 – 139.20g) showed no significant influence of diet. However, DWG significantly (P<0.05) differed among treatments. Diet C (44.82g) which was higher, did not differ from diets A (38.91g), B (37.90) and diet D (43.54g). Birds on diet E (27.05g) had lower value of DWG which was comparable to diets A, B, and D. This concurs with the report of Uchegbu *et al* (2009) in finisher broiler. Feed conversion ratio was also better on diets A (3.52), C (3.15) and D (2.86) than diet E (4.98) which did not differ from diet B (3.95).

The overall phase (Table 3) indicated that total weight gain of birds fed diet B (2528.31g) was higher (P<0.05) than those on other diets (1659.50 – 1982.40g) which were similar. Daily feed intake (107.25 – 116.74g) did not show any significant influence of diet. However, daily weight gain was highest (P<0.05) on diet B (54.63g) and lowest on E (38.76g). Similarly, FCR was best (P<0.05) on diet B (2.14 and poorest (P<0.05) on diet E. This result is in conformity with findings of Sanusi *et al.,* (2015).

The economic analysis of broiler birds fed commercial diets is presented in Table 4. Birds on diet 2 consumed more feed (4.90 kg) than those on other diets (4.50 – 4.81 kg). Feed cost per kg was highest on diets 2 and 5 (₦158.00) which were the same, and lowest on diet 4 (₦150.00). Total feed cost was highest on diet 2 (₦774.20) and lowest on diet 4 (₦675.00). However, feed cost per kg gain was lowest on diet 2 (₦306.01) compared to other diets (₦364.86 – 441.63).

Table 1: Performance of Broiler Chickens Fed Five Different commercial Feeds (1-4 weeks)

	Diets					
Parameters	**1**	**2**	**3**	**4**	**5**	**SEM**
Initial Weight(g)	131.25	132.08	131.93	132.66	132.87	4.26^{NS}
Week 4 weight	1480.38^{b}	2129.69^{a}	1618.82^{b}	1510.81^{b}	1546.59^{b}	74.26^{NS}
Daily Feed intake (g)	84.12	96.00	89.92	90.44	90.34	4.11^{NS}
Daily weight gain (g)	48.18^{b}	71.34^{a}	53.10^{b}	49.22^{b}	50.49^{b}	2.60*
Feed Conversion ratio	1.76^{b}	1.35^{a}	1.69^{b}	1.85^{b}	179^{b}	0.07*
Mortality (%)	2	1	0	1	2	-

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

Table 2: Performance of Broiler Chickens Fed Five Different commercial Feeds (5-6 weeks)

	Diets					
Parameters	**1**	**2**	**3**	**4**	**5**	**SEM**
Final Weight(g)	2025.12^{b}	2660.38^{a}	2114.33^{b}	1987.67^{b}	1792.37^{b}	104.84*
Daily Feed intake (g)	136.02	137.48	139.20	124.08	130.41	8.73^{NS}
Daily weight gain (g)	38.91^{ab}	37.90^{ab}	44.82^{a}	43.54^{ab}	27.05^{b}	5.12*
Feed Conversion ratio	3.52^{a}	3.95^{ab}	3.15^{a}	2.86^{a}	4.89^{b}	0.41*
Mortality (%)	0	0	1	0	0	-

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

Table 3: Performance of Broiler Chickens Fed Five Different commercial Feeds (1-6 weeks)

	Diets					
Parameters	**1**	**2**	**3**	**4**	**5**	**SEM**
Final Weight(g)	2025.12^{b}	2660.38^{a}	2114.33^{b}	1987.67^{b}	1792.37^{b}	104.84*
Total weight gain (g)	1893.87^{b}	2528.31^{a}	1982.40^{b}	1855.01^{b}	1659.50^{b}	103.93*
Daily Feed intake (g)	110.07	116.74	114.56	107.25	110.38	6.15^{NS}
Daily weight gain (g)	43.55^{bc}	54.63^{a}	48.96^{ab}	46.38^{abc}	38.76^{c}	2.91*
Feed Conversion ratio	2.53^{b}	2.14^{a}	2.35^{ab}	2.31^{ab}	2.85^{c}	0.09*
Mortality (%)	2	1	1	1	2	-

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

Table 4: Economic Analysis of Broiler Chickens Fed Five Different commercial Feeds

	Diets				
Parameters	**1**	**2**	**3**	**4**	**5**
Total feed intake (kg)	4.62	4.90	4.81	4.50	4.64
Feeed cost per kg (₦)	151.00	158.00	152.00	150.00	158.00
Total feed cost (₦)	697.62	774.20	731.12	675.00	733.12
Total weight gain (kg)	1.89	2.53	1.98	1.85	1.66
Feed cost per kg gain (₦)	369.11	306.01	369.25	364.86	441.63

Conclusion

Based on the results of this study, commercial broiler feed B was utilized better by the chickens which translated into higher total weight gain. Performance of birds on other diets was almost the same. Feed cost per kg weight gain was lower on diet B and therefore recommended for broiler producers.

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