

**NSAP****47th Annual
Conference
(JOS 2022)****CONFERENCE
PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES****GROWTH PERFORMANCE AND CARCASS EVALUATION OF BROILER
CHICKENS FED FIVE DIFFERENT COMMERCIAL DIETS****Bello, A. R., Doma, U. D. and Kalla, D. J. U.**

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ABSTRACT

A feeding trial to evaluate the growth performance and carcass characteristics of broiler chickens fed different commercial diets sold in Bauchi metropolis was conducted. Two hundred and forty 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 study lasted for six weeks. Overall performance indicated that birds on diets 2 (1974.84g) and 1 (1816.42g) had higher ($P<0.05$) total weight gain compared to those fed other diets. Daily feed intake was higher ($P<0.05$) on diets 2 (112.38g) and 4 (106.18g) and least on diet 3 (92.83g), while daily weight gain was higher on 2 950.64g) and 1 (46.57g) and least on diet 3 (31.62g). Feed conversion ratio was also better on diets 2 (2.23) and 1 (2.30) and poorer on diets 5 (3.06) and 3 (2.95). Results for carcass analysis showed higher ($P<0.05$) dressing percentage on diets 1, 2, 4 and 5 (69.59 – 74.52%) than on diet 3 (61.52%). Relative weight of abdominal fat was higher in birds fed diets 2 (1.52%), 5 (1.38%) 1 (1.31%) and 4 (1.29%) and least on diet 3 (0.49%). It was therefore concluded that commercial diets 1, 2, 4 and 5 gave better performance and carcass yield. Similarly, for better performance and carcass yield, diet 2 was recommended for broiler chicken farmers in Bauchi Metropolis.

Key words: Broiler, Performance, Commercial feeds, Financial benefit.**INTRODUCTION**

Poultry production is gaining popularity in developing countries due to its role in bridging the gap in protein intake in the diets of their citizens. It is practiced at both subsistence and commercial levels. In Nigeria, the consumption of poultry meat and eggs does not suffer any limitation with respect to taboos. The industry has been identified as the most commercialized of all the Nigeria's agricultural subsectors with a current worth of about ₦1.6 trillion (CBN, 2019). According to World Data Atlas (2017), in 2006, Nigeria produced 232,100 mt of poultry meat. However, as at 2017, this quantity declined to 201,493 mt. A number of factors might be responsible for this decrease. Notable among them is the increasing cost of poultry feed ingredients and that of finished commercial feeds that often contain sub-standard nutrient levels. Consequently, the need to source for cheaper and readily available alternative ingredients becomes a necessity. In a similar way, the need to overhaul the quality control agencies of the country in order to check-mate sharp practices in feed manufacturing industries cannot be underscored. Furthermore, regular research work to determine the efficiency of different commercial feeds available in the markets would go a long way in ensuring that feed companies live up to their responsibility of producing quality feeds. Previous studies, at different periods and locations have assessed the quality of commercial broiler chicken feeds sold within Bauchi Metropolis, However, these studies are not enough considering the fact that the feed markets are always filled with new batches of feeds. It is therefore the aim of this study to evaluate the quality of some of these feed brands currently sold in Bauchi metropolis.

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MATERIALS AND METHODS

Study Area

The experiment was conducted at the Teaching and Research Farm, Abubakar. Tafawa Balewa University, ATBU, Bauchi. The area is located within the Southern Guinea Savannah on latitude 10° 18' 37.2" N and longitude 9° 50' 38.0" E, characterized by two well-defined seasons; Rainy season (May - October) and dry season (November - April). The average annual rainfall of Bauchi is about 1009 mm, highest relative humidity 94 % (August) and the lowest 35 % (February). Temperatures are between 13 – 17° C (December – February) and 36 – 37° C (March – April) (World Atlas, 2015).

Experimental Design and Management of Birds

Two hundred and forty day-old chicks were brooded for two weeks and thereafter allotted to five different commercial diets designated as 1, 2, 3, 4 and 5 in replicates of 3 containing 16 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.

Data Analysis

Data was analysed statistically using SPSS 25.0 software employing ANOVA and Duncan Multiple Range Test (Post-hoc analysis) to compare means among treatments and significance at $P < 0.05$ was assumed.

RESULTS AND DISCUSSION

The effects of different commercial diets on growth performance of broiler chickens are summarized in Table 1. All parameters were significantly ($P < 0.05$) influenced. This implies that there was a great variability in the quality of commercial feeds used in the study. Final weight of birds on diet 2 (2099.35g) which compared favourably with diet 1 (1940.93g), was higher than those on diet 4 (1766.67g), followed by those 4 (1766.67g), then diet 3 (1357.01g) and 5 (943.43g) in that order. However, diet 4 did not differ significantly from diet 1. The same trend was recorded for total weight gain. Daily feed intake was higher ($P < 0.05$) on diet 2 (112.38g) which was the similar to 106.18g (diet 4), followed by 92.83g (diet 3), then 63.54g (diet 5). However, diets 3 and 1 (99.23g) were comparable. Values obtained for DFI in this study are a little higher than 78.50 – 87.30g reported by Mubarak and Ahmed (2020). Daily weight of birds fed diet 2 (50.64g) was higher than 42.12g (diet 4) but similar to 46.57g (diet 1). This was followed by those on diet 3 (31.62g) while those fed diet 5 (21.08g) had the lowest ($P < 0.05$) DWG. The range of values for DWG in the present study is comparable with 31.53 – 42.92g reported by Yisa *et al.* (2020). Feed conversion ratio was better ($P < 0.05$) on diet 2 (2.23) which did not differ from 2.30 (diet 1). Diets 3 (2.95), 4 (2.53) and 5 (3.06) were the same. However, all these FCR values are within the range of 1.29 – 3.26 for broiler chickens between 1-9 weeks recommended by Olomu (2011).

Carcass and organ characteristics of broiler chickens fed different commercial diets is presented in Table 2. Nearly all the parameters showed a significant ($P < 0.05$) influence of diet. Live weight of birds was higher ($P < 0.05$) on diet 2 (2750.00g) which was comparable with diets 1 (2416.67g) and 4 (2088.33g), but least on diet 5 (1458.33g). Carcass weight was higher on diet 2 (2016.67g) which is similar to diets 1 (1916.67g) and 4 (1533.33g) and least ($P < 0.05$) on diet 5 (1016.67g). However, dressing percentage was higher ($P < 0.05$) and the same on all other diets (69.59 -74.52g) other than diet 3 (61.52g). These values are comparable with 65.70 – 70.77% recommended by Ravindran and Savakanesan (1996) and Salami *et*



al. (2014) for well-dressed broiler chickens. Liver weight was however, higher on diets 3 (2.71%) and 5 (2.47%) which were the same, than on diet 1 (1.93%). However, diets 2 (2.25%) and 4 (2.35%) did not differ from diets 3 and 5. Abdominal fat weight was higher ($P<0.05$) in birds' fed diets 1, 2, 4 and 5 (1.29 – 1.52%) than those on diet 3 (0.49%). Kidney weight was higher ($P<0.05$) on diet 5 (0.67%) which compared favourably with diet 3 (0.58%) than on other diets (0.43 – 0.51%) which were the same. However, diet 3 did not differ from all other diets. Weight of gizzard was higher ($P<0.05$) on diet 5 (1.93%) which was similar to diets 4 (1.59%) and 1 (1.46%), and lower on diets 2 (1.33%) and 3 (1.27%). These diets (2 and 3) are however comparable with all other diets. Intestinal weight was higher and similar on diets 4 (3.24%), 5 (3.22%) and 3 (2.90%). Diets 1 and 2 which had respective values of 2.31 and 2.71% had lower weights.

Table 1: Performance of Broilers Chickens Fed Different Commercial Diets

Parameter	Diets					SEM
	1	2	3	4	5	
Initial weight (g)	124.51	124.51	124.02	124.02	121.32	1.74 ^{NS}
Final weight (g)	1940.93 ^{ab}	2099.35 ^a	1357.01 ^c	1766.67 ^b	943.43 ^d	121.74*
Total weight gain (g)	1816.42 ^{ab}	1974.84 ^a	1232.97 ^c	1642.65 ^b	822.11 ^d	110.81*
Daily feed intake (g)	99.23 ^{bc}	112.38 ^a	92.83 ^c	106.18 ^{ab}	63.54 ^d	4.16*
Daily weight gain (g)	46.57 ^{ab}	50.64 ^a	31.62 ^c	42.12 ^b	21.08 ^d	3.13*
Feed conversion ratio	2.30 ^a	2.23 ^a	2.95 ^b	2.53 ^{ab}	3.06 ^b	0.23*
Mortality (%)	4.16	0	4.16	2.08	2.08	-

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

Table 2: Carcass and Organ characteristics of Broiler Chickens Fed Different Commercial Diets.

Parameter	Diets					SEM
	1	2	3	4	5	
Live weight (kg)	2416.67 ^{ab}	2750.00 ^a	1816.37 ^{bc}	2088.33 ^{abc}	1458.33 ^c	343.43*
Carcass weight (kg)	1741.67 ^{ab}	2016.67 ^a	1166.67 ^{bc}	1533.33 ^{abc}	1016.67 ^c	265.15*
Dressing percentage	71.96 ^a	73.49 ^a	61.52 ^b	74.52 ^a	69.59 ^a	2.16*
Organs weights expressed as per cent live weight						
Liver	1.93 ^b	2.25 ^{ab}	2.71 ^a	2.35 ^{ab}	2.47 ^a	0.21*
Abdominal fat	1.31 ^a	1.52 ^a	0.49 ^b	1.29 ^a	1.38 ^a	0.29*
Kidneys	0.44 ^b	0.43 ^b	0.58 ^{ab}	0.51 ^b	0.67 ^a	0.07*
Gizzard	1.46 ^{ab}	1.33 ^b	1.27 ^b	1.59 ^{ab}	1.93 ^a	0.21*
Intestinal weight	2.31 ^b	2.27 ^b	2.90 ^a	3.24 ^a	3.22 ^a	0.23*

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a, b, c 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 results of this feeding trial it was concluded that Broiler chickens fed diets 1 and 2, which gave total weight gains of 1974.84g and 2016.67g respectively, performed better than those on other diets, hence recommended for broiler chicken farmers.

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