RESPONSE OF BROILER CHICKENS TO DIFFERENT COMMERCIAL DIETS IN BAUCHI, BAUCHI STATE

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ABSTRACT
The study was conducted to evaluate growth performance and cost implication of broiler chickens fed commercial diets in Bauchi town of Bauchi state. Two hundred and twenty five day old chicks were assigned to five dietary treatments in replicates of three containing fifteen chicks each in a completely randomized design. Feed and water were supplied adlibitum and the experiment lasted for twenty eight days. Performance parameters which include daily feed intake, daily weight gain, final weight gain, total weight gain were studied. The final weight gain, total weight gain and daily weight gain were significantly ($P<0.05$) affected by the dietary treatments. The highest values of final weight gain (1522.70g), total weight gain (1426.30g) and daily weight gain (50.94g) were obtained on diet 4, although did not differ from those fed diet 1. Total feed intake (2077.30-2203.70g), feed conversion ratio (1.54-1.74) and feed efficiency (0.58-0.66) were not affected ($P>0.05$) by the diets. The feed cost per kilogram body weight gain ranged between ₦ 456.90 and ₦ 485.04 with the lowest value obtained in broiler birds fed diet 2, hence recommended for broiler chicken production in the study area.
Key words: Broiler**,** Response, Commercial diets, Cost benefit

INTRODUCTION
Animal protein market trends are rising globally and the sector is expected to be one of the fastest growing agricultural sectors in the coming decade (Adeyemi *et al*., 2021). Despite the increase in livestock production, Fasuyi and Aletor (2005) reported that per capita consumption of animal protein had been on the decline for the past decades. This was due to inadequate supply of animal products from livestock industry. Available statistics indicated that Nigeria was ranked high amongst countries where the intake of protein is low, it is estimated on the average that Nigerians consumed about 7g of protein per day instead of 28g/head/day as recommended by FAO (Uchegbu *et al*., 2009). The shortage of animal protein among average Nigerians demands logical solution such as an increase in the production and consumption of poultry products. Although, best logical solution to Nigeria meat scarcity is to increase broiler chicken production FAO (2006), however, nutrition is perhaps the most important consideration in livestock management. Inadequate supply of feeds, nutritionally unbalance rations, adulterated ingredients or stale feeds are some of the factors responsible for low productivity of livestock in tropics (Ogundipe and Sanni, 2002). Given the increasing number of people venturing into poultry business, there is no doubt that there is a high demand for commercial feeds. There is now a tendency for feed manufacturers to produce substandard feeds, especially as the quality control agencies in Nigeria are non-existent or non-functional as noted Omede (2008). This appears that the farmers, consumers and the public at large are left at the mercy of commercial feed millers and feed raw materials producers and processors, the findings of Uchegbu *et al*. (2009) shown variation in the performance of birds fed with different commercial diets. Hence the need for the study to examine the response of feeding some selected commercial diets on the overall performance of broiler chickens periodically.

MATERIALS AND METHODS

Study Area
The experiment was conducted at the school farm of Abubakar Tafawa Balewa University, situated within the southern savannah on latitude 10°18’ 37.2’’ North and longitude 9°50’ 38.0’’ at an altitude of 590m above sea level. There are two distinct seasons in the area. A rainy season, which starts in May and ends in October and dry season that starts from November to April with mean annual rainfall of 1009mm with highest relative humidity of 94% around August and lowest of 35% in February. Temperature ranges 13-17^{0}C (December-February) and 36-37^{0}C (March-April). (World Atlas, 2015).

Experimental Design and management of Experimental Birds

Two Hundred and Twenty Five (225) unsexed Broiler chicks bought at day old from reputable source in Bauchi were brooded for a period of one week before the commencement of the experiment. After which were randomly divided into five (5) treatment groups, each group was further replicated three (3) times with fifteen (15) chicks each. The five (5) treatment groups were randomly assigned to the five commercial diets in a Completely Randomized Design (CRD). The chicks were subjected to the same experimental and management conditions. Feed and water were provided *adlibitum*. The experiment last for a period of four (4) weeks.

Data Collection

Feed intake, weight gain, feed conversion ratio and feed efficiency were the growth performance parameters measured during the study period. Initial live weights of the chicks were taken at the beginning of the experiment, thereafter, weekly weights were measured. These are in turn used to determine the daily weight gain (DWG). Weekly feed intake (WFI) were also calculated by subtracting the weight of left-over from the amount offered the previous week and daily mean feed intake were determine by dividing the amount by seven.

Data Analysis

Data generated were subjected to one-way analysis of variance (ANOVA) as described by Steel and Torrie (1980) using the computer software package Minitab version 17 and significant differences between treatment means were separated using Least Significant Difference (LSD).

RESULTS AND DISCUSSION

The result for the growth response of broiler chickens to different commercial diets is presented in Table 1. Final weight was significantly ($P<0.05$) differed among the diets in which broiler birds fed diet 4 (1522.70g) had the highest final weight although similar to those on diet 1 (1366.30g), least values of 1357.1, 1356.20g and 1348.30g were obtained from the birds fed diets 3, 5 and 2 respectively, which were statistically similar. Total weight gain followed a similar trend with higher value of 1426.30g recorded from the birds fed diet 4 which were followed by those fed diet 1 (1270.90g), the least values of 1263.90, 1261.70 and 1250.70g were recorded from the birds on diets 3, 5 and 2 respectively which were statistically similar. Daily weight gain also differed significantly ($P<0.05$) with highest value of 50.94g observed from the birds on diet 4 which was followed by those on diet 1 (45.39g) and the least values of 45.15, 45.06 and 44.67g were obtained from those on diets 3, 5 and 2 respectively even though similar statistically. These are in agreement with reports of Uchegbu *et al.* (2009) in broiler chickens fed three commercial feed.

Table 1: Growth performance of Broiler Chicken Fed Different Commercial Diets

	Diets					
Parameters	**1**	**2**	**3**	**4**	**5**	**SEM**
Initial weight(g)	95.40	97.62	93.02	96.43	94.45	2.82^{NS}
Final weight (g)	1366.30^{ab}	1348.30^{b}	1357.10^{b}	1522.70^{a}	1356.20^{b}	26.93*
Total weight gain (g)	1270.90^{ab}	1250.70^{b}	1263.90^{b}	1426.30^{a}	1261.70^{b}	26.88*
Daily weight gain (g)	45.39^{ab}	44.67^{b}	45.15^{b}	50.94^{a}	45.06^{b}	0.96^{*}
Total feed intake (g)	2203.70	2100.30	2077.30	2184.20	2114.30	52.18^{NS}
Daily feed intake (g)	78.70	74.94	74.19	78.01	75.51	1.85^{NS}
Feed conversion ratio	1.74	1.68	1.65	1.54	1.66	0.05^{NS}
Feed efficiency	0.58	0.59	0.61	0.66	0.60	0.02^{NS}

^{abc} means within row with different superscripts differed significantly * = ($P<0.05$), SEM = Standard Error of Mean, NS = Not Significant

The Economic benefit of broiler chickens fed different commercial diets is presented in Table 2. In which the highest feed consumption was observed from chickens fed on diet 1 (2.20kg), while those on diet 3 (2.08kg) consumed least, others ranged between (2.10-2.18kg). Feed cost per kg was highest

on diet 4 (₦ 320.00) and lowest on diet 2 (₦ 272.00) diets 1 and 5 had (₦ 280.00) each and diet 3 (₦ 283.00). Total feed cost was highest on diet 4 (₦ 697.00) and lowest on diet 2 (₦ 571.20). However feed cost per kg gain was lowest on diet 2 (₦ 456.96) as compared to other diets which ranged between (₦ 468.83-487.83). These values are comparable those reported by Ogundipe (2002).

Table 2: Cost Benefit of Broiler Chickens Fed the Commercial Diets

	Diets				
Parameters	**1**	**2**	**3**	**4**	**5**
Total feed intake (kg)	2.20	2.10	2.08	2.18	2.11
Feed cost per kg (₦)	280.00	272.00	284.00	320.00	280.00
Total feed cost (₦)	616.00	571.20	590.72	697.60	590.80
Total weight gain (kg)	1.27	1.25	1.26	1.43	1.26
Feed cost per kg gain (₦)	485.04	456.96	468.83	487.83	468.89

CONCLUSION AND RECOMMENDATIONS

Almost all the growth performance parameters studied showed that broiler chickens fed diet 4 performed significantly better than those on the other diets. Lowest Feed cost per kilogram body weight gain was observed on broiler birds fed diet 2.

Further study should be conducted with other poultry species chickens to evaluate their productive performance and carcass yield.

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