



PERFORMANCE OF BROILER CHICKENS FROM DIFFERENT SOURCES FED A COMMERCIAL DIET

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ABSTRACT

An experiment was conducted to evaluate the growth performance of broiler chickens from different sources fed a commercial diet. Broiler chickens from four different hatcheries were used and designated as treatment A, B, C and D. The experimental diet consists of a selected commercial diet that was regular and available throughout the year. Two hundred day old unsex broiler chicks were randomly allotted by source to four Treatments in a completely randomized design. Each treatment of 50 chicks was divided in three replicates of 16 birds per each. The result on performance parameters showed that feed intake on both starter (64.10 - 75.52 g) and finisher phases (127.85- 158.43 g) were significantly affected ($P < 0.01$ and $P < 0.05$, respectively), while body weight gain and feed conversion ratio at both phases were not affected. Overall phase showed that daily feed intake, daily weight gain and feed conversion ratio were not significantly affected. The result on carcass and gut characteristics parameters revealed no significance difference among the treatment groups. The economic analysis showed that feed cost per/kg gain was higher (₦508.10) on treatment B, followed by treatment C (₦493.74) and D with (₦484.59) while treatment A recorded the lowest (₦454.36) which proved to be more economical. It can be concluded from the result of the study that all the broiler chickens from different sources gave good performance in terms of growth and carcass yield. However, treatment A was more economical to produce in the study area.

Keywords: Broiler chicken, Carcass yield, Diet, Performance, Source.

INTRODUCTION

Poultry industries in Nigeria occupy a prominent position as a major source of animal protein supply to the citizen. Over the years, the growth of poultry industry has followed a pattern closely dictated by the economic fortunes of the countries. USDA (2013) reported that commercial poultry production in Nigeria was estimated at about USD 800 million. Poultry sector contributed about 25% of the agricultural domestic products of the Nigeria economy (Food and Agriculture Organization [FAO], 2010). USDA, (2013) currently rated Nigeria as the leading country in Africa with respect to eggs production, but fourth in broiler production, this report indicated that Nigeria still has to improve on their production with respect to broiler birds. Poultry production is practice in all levels ranging from subsistence to large scale commercial operation. Poultry meat and egg are the consumed animal protein, unrestricted by any religion or culture in Nigeria. It was recorded that the poultry contributed about 25% of the country's Agricultural GDP (FAO, 2010). Recent advances in broiler chickens' production have necessitated the research into the different sources of these broiler chickens for hardiness and high productivity. The need for increased animal protein consumption of the rural and urban Nigeria populace in the face of rising population and inflation has resulted in researching in to the best source to obtain these broiler chickens that will give the expected output (Agbogidi and Okonta, 2011).



MATERIALS AND METHODS

Experimental Design

The experiment was conducted at the Abubakar Tafawa Balewa University, Poultry Research farm in Yelwa campus Bauchi, Bauchi State, Nigeria. The experimental diet consists of a selected commercial diet that is regular and available throughout the year in Bauchi metropolis and environs. After one week of brooding, the birds were randomly weighed per source and allotted to four (4) treatments with 50 birds each and further replicated three times with 16 birds per replicate in a Completely Randomized Design (CRD). The treatments were four sources of broiler chickens designated as treatment A, B, C and D. Feed and water were supplied *ad libitum* and the experiment lasted for six (6) weeks. All the recommended vaccines and drugs were administered appropriately. During the study, data were collected on growth performance which include; feed intake, body weight gain, feed conversion ratio and mortality. Carcass yield and internal organs characteristics were measured and expressed as a percentage of live weight. Proximate compositions of the commercial diet fed to the broiler chickens (Table 1)

Table 1: Proximate Composition (%) of the Commercial Diet Fed to Broiler Chickens

Parameter	Starter	Finisher
Crude Protein	20.0	18.0
Crude fat	4.5	5.0
Crude fibre	5.0	5.0
Calcium	1.0	0.9
Phosphorus	0.44	0.4
Met. Energy (MJ/kg)	12.30	12.50

RESULTS AND DISCUSSION

The productive performance of broiler chickens obtained from different sources is presented in Table 2. The results showed that daily feed intake (DFI) of the broiler chickens was significantly ($P < 0.01$) different among the treatment means during the starter phase. The values obtained ranged from 64.10 to 75.52 g for broiler chickens in treatments C and B, respectively. The significant difference observed in DFI at the starter phase could be due to early acceptability and palatability of the experimental diet, this observation agrees with the findings of Linderman *et al.* (1986), Cherry and Jones (1982) and Kass *et al.* (1980) who reported in their separate studies that the extent to which an animal will consume a particular feed is dependent on the fibre source, palatability of the diet, lignifications of the feed and chemical variation in the fibre itself. The daily feed intake (DFI) at the finisher phase showed significant ($P < 0.05$) difference among the treatment means. Broiler birds in treatment C had higher value of 158.43 g while the birds in treatment D had the lowest value. The significant difference could be attributed to the diverse nature or genetic traits of the birds from different sources. The values recorded at the finisher phase is in conformity with the report of Okah and Onwujariri (2010) who observed 158.61 g/bird/day for a broiler chickens fed dietary maize processing waste as a replacement for maize. Feed intake at the overall phase (1-6 weeks) showed no significant difference across the treatment means. The result obtained shows total acceptability of the experimental diet across the treatment due to the higher quality and palatability.

The result (Table 2) also conforms with the findings of Igwebuike *et al.* (2001) and Nsa *et al.* (2009) in their separate studies reported no significant difference in feed intake when



maize offal and brewers dried grain (BDG) where fed to broiler chickens. The result on daily weight gain (DWG) during the starter phase showed no significant difference among the treatment means. The values obtained ranged between 42.76 and 45.96 g for broiler birds on treatments C and D respectively, this observation is in agreement with the report of Grace et al. (2007), Ajaja et al. (2002), Chae et al. (2002) and Dafwang and Shwarmen (1996) who reported that, there were no significant differences in body weight gain among the treatment means. Similarly, Bamgbose (2012) also reported no significant different in broiler bird's growth performance when such by-product (fibre) was fed to broiler chickens.

Table 2: Performance of Broiler Chickens from Different Sources Fed Selected commercial Diet

Table with 7 columns: Parameters, Treatment (Source) A, B, C, D, SEM, LSD. Rows include Starter phase (1-4 weeks) and Finisher phase (4-6 weeks) metrics like Initial weight, Daily feed intake, Daily weight gain, Feed conversion ratio, and Mortality.

* = (P<0.05), ** = (0.01), Ns = Not Significant, SEM = Standard error mean, LSD = Least significant difference, A – D = Different Treatment (Source of bird).

As reported in Table 2, the daily weight gain was not affected at the finisher phase and the values obtained varied between 52.63 and 67.62 g bird/day for treatment B and A, respectively. The values observed in this study were slightly higher than those reported by Grace et al., (2007) who detained lower weight gain of 37.10 g/head/day, and also Ani and Okori (2008) who observed an average daily weight gain of 64.72 g/head/day in Anak strain from six weeks of age to market size. No significant variation in weight gain within the treatment groups indicate that the growth performance of the four different sources were similar. However, it can also be attributed to the adequate metabolizing energy and crude protein in the experimental diet ranging from 2950 to 3000 kcal/kg and 20.0 to 18.0 % for starter and finisher respectively; these values are similar with the report of Aduku (2005) who reported 2,800 kcal/kg ME and 3,000 kcal/kg ME requirement for starter and finisher broiler chickens respectively. Daily weight gain at the overall phase showed no significant difference



across the treatment means. This could be attributed to the nutrient availability and density in the diet. The result is in line with that finding of Bulus *et al.* (2014) who also observed and concluded that complete replacement of maize with pearl millet, finger millet or with yellow guinea corn in broilers diet did not impair feed intake, body weight, feed conversion and nutrient retention. The mortality values ranged from 2-4. On this study no mortality was recorded in the starter phase. However, 4, 2, 4, 3 was recorded for Treatment A, B, C and D in finisher and overall phase, respectively.

The carcass and gut characteristics (Table 3) of broiler chickens from different sources fed a commercial diet did not show any significant difference in all the parameters measured. This work is in agreement with the findings of Torres *et al.* (2016) who reported that there was no significant difference among the treatment in whole carcass or carcass part weight of broiler chickens fed on sorghum-based diets at 42 days of age.

Table 3: Carcass and Gut Characteristics of Broiler Chickens from Different Sources Fed Selected Commercial Diet

Parameters	Treatments				SEM	LSD
	A	B	C	D		
Live weight (kg)	2.53	2.38	2.58	2.38	0.11	NS
Plucked weight (kg)	2.42	2.27	2.43	2.27	0.11	NS
Eviscerated weight (kg)	2.18	2.12	2.17	2.08	0.09	NS
Carcass weight(kg)	2.03	1.93	2.02	1.92	0.08	NS
Dressing percentage	80.30	81.20	78.21	80.52	1.37	NS
Lungs (%)	0.53	0.46	0.46	0.46	0.05	NS
Head (%)	2.54	2.74	2.41	2.46	0.08	NS
Kidney (%)	0.14	0.17	0.16	0.22	0.00	NS
Spleen (%)	0.07	0.04	0.07	0.06	0.00	NS
Heart (%)	0.41	0.40	0.38	0.40	0.00	NS
Gizzard (%)	1.67	1.52	1.53	1.59	0.12	NS
Small intestine (%)	2.92	2.94	3.17	2.50	0.26	NS
Large intestine (%)	0.16	0.17	0.15	0.16	0.00	NS
Abdominal fat (%)	1.37	1.08	0.93	1.19	0.15	NS
Pancreas (%)	0.19	0.23	0.17	0.21	0.00	NS
Liver (%)	1.91	1.69	1.88	1.73	0.12	NS
Leg (%)	3.43	3.79	3.95	3.90	0.23	NS
Caeca (%)	0.87	0.57	0.81	0.58	0.08	NS
Shank length (Cm)	4.50	4.58	4.92	5.17	2.20	NS

NS = Not significant, SEM = Standard error of mean, LSD = Least significant difference

The economic benefit (Table 4) showed that total feed intake (TFI) varied between 4.22 and 4.62 kg in treatments D and C. the feed cost per kilogram was (₦240) for the experimental diet used. The total feed cost was highest on treatment C (₦ 1120.80) while the lowest was found on treatment D (₦1012.80). Broiler birds on treatment A have the highest body weight gain of 2.34 kg per bird. The lowest feed cost per kilogram body weight gain of ₦454.36 was obtained on treatment A. This observation was similar to the value reported by Ajaja *et al.* (2002) in broiler birds fed sorghum-based diets. The lowest feed cost per kilogram gain found on treatment A determines it is the most economical.



Table 4: Financial Benefit of Broiler Chickens from Different Sources Fed Selected Commercial Diet

Parameters	Treatments			
	A	B	C	D
Total Feed Intake (kg)	4.43	4.34	4.67	4.22
Feed Cost (₦/kg)	240	240	240	240
Total Feed Cost (₦)	1063.20	1041.60	1120.80	1012.80
Total weight Gain (kg)	2.34	2.05	2.27	2.09
Feed Cost/kg gain (₦)	454.36	508.10	493.74	484.59

Key: A, B, C and D = Treatments (Sources of birds)

CONCLUSION AND RECOMMENDATIONS

The non significance obtained in most of the performance and carcass parameters indicated that all the broiler chickens from different sources used in this study are suitable for Bauchi environment. It was therefore recommended that broiler chicken farmers in the study area should source their day-old chicks preferably from source A due to it lower feed cost per kilogram body weight gain for better performance, reduced feed cost and profit maximization. Further studies should be conducted using different breeds and types of poultry as well as different brand and forms of commercial feeds.

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