

COMPARATIVE EVALUATION ON GROWTH PERFORMANCE OF STARTER BROILERS FED SELF-FORMULATED AND COMMERCIAL FEEDS.

Onwujiariri, E. B. and Jiwuba, P.C.

Department of Animal Production Technology, Federal College of Agriculture, P.M.B.7008, Ishiagu, Ebonyi State, Nigeria.

Corresponding author: eberechukwu557@yahoo.com

ABSTRACT

One hundred and twenty Abo acre breed of broiler birds were used for the trial, that lasted for 24 days. Four different commercial feeds and self-formulated feed (FF) as control were used to determine the growth performance of the broilers. The birds were grouped into five (5) treatments as T₁ control, T₂ hybrid, T₃ supreme feed, T₄ rainbow and T₅ vital feed. Each was replicated three (3) times with eight (8) birds per replicate in a completely randomized design (CRD). The proximate analysis had varying proximate compositions, with supreme feed, self-formulated and hybrid having high crude protein values. The result on growth performance showed that all the parameters examined were significantly different (P<0.05). Weight gain was best (P<0.05) at T₁ and T₂. The varied performance of the birds on the different commercial feeds is an evidence of variability in nutrient composition of the commercial feeds; and this is an important factor to be considered by farmers in the choice of feeds for broiler production.

Key words: broilers, growth performance, formulated diet and commercial feed.

INTRODUCTION

Poultry production plays a pivotal role in animal protein supply in Nigeria and beyond due to its fast growth rate and efficient feed utilization. It has been described as one of the fastest means of achieving appreciable improvement in the nutritional standard of Nigeria populace because of its short generation interval, quick turnover rate, relatively low capital investment and efficient feed utilization (Jiwuba *et al.*, 2016). Perhaps, increasing the production of animal protein at a reasonable cost to enhance the quality of diets among Nigerian has been a major concern to animal scientists and poultry have been essential in this regard. The poultry sector constitutes more than 57% of the total livestock production in Nigeria (Alabi and Osito, 2004) and may be higher today. In most developing countries like Nigeria, meat production has been drastically reduced following inadequate feed supply resulting to high cost of the products. Similarly, in Nigeria today, a large number of people living in the country considers poultry products (chicken and egg) as luxury. This is greatly due to high cost of poultry meat and eggs, which is controlled by the high cost of conventional feeds. The feed industry is faced with acute shortage and high cost of feed ingredients, which may have led to the adulteration and hence poor quality of commercial feeds. Noteworthy, the feed must be formulated in such a way not to compromise the nutritional need of the birds, but should be however be

at an affordable cost. However, most of the feed industries no longer border about meeting the nutritional needs of the birds, in attempts to maximize profit. The poor quality of most of the commercial feeds may be attributed to the relative negative performance of the birds fed such diets. Domaet *al.* (2001) and Uchegbuet *al.* (2007) attributed poor performance of birds fed commercial feeds to poor quality of the diets. This situation is worsened today because, there is virtually no quality control and a number of small to medium scale poultry farmers depend solely on commercial diets. This study was therefore conducted to evaluate the growth performance of broilers fed different commercial and self-formulated feed.

MATERIALS AND METHODS

The research work was carried out at the Teaching and Research farm of Animal production Technology Department, Federal College of Agriculture Ishiagu, Ivo Local Government area, Ebonyi State. The College is situated and longitude at Latitude 5.56°N and 7.31°E, with an average rainfall of 1653mm and a prevailing temperature of 28.50°C and relative humidity of about 80%.

A total of one hundred and twenty (120) day old chicks were purchased from Farm associate, Enugu, Enugu State, Nigeria. The experiment had four (4) treatments and each treatment was randomly assigned thirty (30) birds replicated three times with ten (10) birds per

replicate in a completely randomized design (CRD). The birds were assigned the four experimental diets designated as T₁, T₂, T₃, T₄ and T₅. The birds were housed in a concrete floor covered with wood shaving as litter material equipped with feeders and drinkers. Before the arrival of the day-old chicks, the brooding house was swept, washed, disinfected, and allowed to dry. The brooder house was pre-heated for 6–12 h to enable it to reach the normal temperature (32 °C) required by a day-old chick. Feed and water were provided *ad libitum*. Heat and light were provided for

the first 14 days with stoves and electric bulbs. The birds were vaccinated against infectious bursal (Gumboro) disease at days 10 and 24, respectively, while the NDV-Lasota vaccine was given on days 1, 14, and 28 to protect the birds against Newcastle disease. Initial live weights of the birds were taken at the beginning of the feeding trial and weekly thereafter. Final live weight was obtained by weighing the birds at the end of the experiment. Daily weight gain, daily feed intake, and feed conversion ratio were calculated accordingly.

Table 1: Composition of experimental diets (starter phase)

Parameters	T ₁ (FF)	T ₂ (Hybrid)	T ₃ (Supreme)	T ₄ (Rainbow)	T ₅ (Vital)
Maize	52.00				
Soybean meal	35.00				
Wheat offal	7.00				
Fish meal	2.00				
Bone meal	2.50				
Limestone	0.50				
Methionine	0.25				
Lysine	0.25				
Premix	0.25				
Salt	0.25				
Total	100.00	100.00	100.00	100.00	100.00

FF= formulated feed

All feeds were analyzed for proximate compositions using the method of AOAC (2000). The nitrogen free extract was derived by subtracting the sum of other proximate components, crude protein, crude fat, ash, crude fibre on dry weight basis from 100.

The results were analyzed using the Statistical Package for Social Science Window 17.0. One-way

analysis of variance (ANOVA) was employed to determine the means and standard error. Significant differences between the treatment means were separated using the Duncan Multiple New Range Test (Duncan, 1955).

RESULTS AND DISCUSSION

Table 3: Proximate analysis of the diets (starter broiler)

Parameters (%)	T ₁	T ₂	T ₃	T ₄	T ₅
Dry Matter	90.71	92.90	92.51	92.25	92.10
Crude Protein	22.36	21.51	23.26	18.50	19.00
Crude fibre	3.63	3.45	4.10	3.68	7.31
Ether Extract	2.15	3.86	4.44	6.26	7.31
Ash	12.60	9.88	12.77	15.27	11.57

The chemical composition of the experimental diets for starter broilers are presented in Table 3. The experimental diets were analyzed for dry matter (DM), crude protein (CP), crude fibre (CF), ash and ether extract (EE). The DM of the starter diets ranged between 90.71 and 92.90%, for T₁ (self-formulated feed) and T₂ (hybrid feed). The CP content ranged 18.50 to 23.26 % with the highest value (23.26%) recorded for T₃(supreme feed) and a corresponding

lowest value of 18.50% (rainbow) recorded for T₄. The CF ranged between 3.45 and 7.31% for T₂ (hybrid feed) and T₅ (vital feed) respectively. The ash values ranged between 9.88 and 15.27%, for T₂ (hybrid) and T₄ (rainbow) respectively. The EE values ranged between 2.15 and 7.31% for T₁ (self-formulated feed) and T₅ (vital feed) respectively. The CP value of 22.36% reported for T₁ compared well with 21.51 and 23.26% for supreme but higher than 21.51, 18.50 and

19.00% reported for hybrid, rainbow and vital feed respectively. FF, hybrid and Supreme feeds are within the recommended 21-24%, 20-24%, and 23% for broiler starters according to Ensminger *et al.* (1990),

Defang *et al.* (2008) and Oluyemi and Robert (2000) respectively, while rainbow and vital feeds are below the recommended values.

Table 4: Growth performance of starter broilers fed commercial and formulated feeds

Parameters	T ₁	T ₂	T ₃	T ₄	T ₅	SEM
Initial body weight (g)	60.60	58.50	58.30	56.50	58.00	39.53
Final body (g)	1758.00 ^a	1740.52 ^a	1650.50 ^b	1610.20 ^b	1636.67 ^b	44.43
Total Weight gain (g)	1697.40 ^a	1682.02 ^a	1592.20 ^b	1553.70 ^b	1578.67 ^b	33.07
Total feed intake (g)	2305.00 ^a	2310.00 ^a	2125.75 ^c	2215.50 ^d	2250.40 ^b	67.4
FCR	1.36 ^{bc}	1.37 ^b	1.34 ^c	1.43 ^a	1.43 ^a	0.76

^{a-c} Means with different superscripts along the same row are significantly (P < 0.05) different

The growth performance of the starter broilers fed commercial and self-formulated feeds is presented in Table 5. All the parameters examined showed significant (P<0.05) difference across the treatment groups. The body weight gain of 1553.70 to 1697.40 g reported for the starter broilers in this study is higher than 765.2 - 845.82 g reported by Jiwuba *et al.* (2016) for starter broilers fed processed cocoyam corm meal and lower than 1826.7 – 2210g for broiler starters fed cassava peel meal as reported by Abu *et al.* (2015). The total weight gain was also best (p<0.05) at T₁ and T₂, this maybe attributed to better feed utilization and possible better nutrient composition and balance of the respective treatments. The total feed intake differed (P<0.05) significantly with T₁ and T₂ having better values. The lower feed intake reported for T₃, T₄ and T₅ may be attributed in part to high dietary fibre. In earlier study, (Hocking, 2006) birds on high fibre diets have been reported to be unable to completely satisfy their energy and protein intake due to limitation imposed by the fibre in the diet. The better (p<0.05) feed conversion ratio observed for T₁ and T₂ is evidenced with better performance of the respective treatments.

CONCLUSION

Variability in the nutrient contents of commercial feeds appeared to be an important factor that resulted to performance differences observed in this study. Rainbow feed seems to be the poorest from results obtained in this study especially in terms of crude protein, weight gain and feed utilization.

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