12.31.2023 BERKELEY JOURNAL OF brpi

Entomology and Agronomy Studies (BJEAS) Vol. 2 No.2

COMPARATIVE STUDY OF SELF AND COMMERCIALLY FORMULATED FEED ON PERFORMANCE OF BROILER CHICKENS

SANDRA, GALILEE

Department of Animal Health and Production, Federal polytechnic Bali, Taraba State, Nigeria.

ABSTRACT

This study is aimed at comparing the effect of commercial and self-formulated feed on performance and gut development using Cobb 500 zarterch broilers. 500 day old broiler chicks were ordered from a commercial hatchery, management were intensively based on animal welfare standard. Chicks were assign to five treatment in a complete randomized design in order to evaluate to effects of the feed on performance and gut development. Performance data were record in excel and SPSS version 23 software was used to analyze the data. Feed intake, body weight, feed conversion ratio and average body weight gain were measure weekly. No significant differences was seen on all the parameters measure throughout the research trial. Birds fed diet A. (commercial feed) produced the heaviest weight (739g) and (2699g) both at the starter and finishers phase respectively compared to other treatments. Similarly, an improved feed conversion ratio and average body weight gain has been observed in birds fed diet A compared to other treatments. Based on the result from the current study,

Introduction

The increased in cost of commercially formulated feeds has a serious impact to poultry production and profit for intensive commercial broiler farming worldwide. This led to an increase in price of broiler chicken in Nigeria (FAO, 2013). Poultry refers to all domesticated birds kept for eggs or meat production. (FOA, 2011). Poultry (chickens) among all the domesticated birds have no religion or cultural barrier hindering the production and consumption worldwide (Metekia, et al., 2022 and Igbokwe 2010)

Among all these food producing birds in Nigeria and other parts of the world, chickens are probably more than all the other birds and found throughout, (Feetham 1990). Poultry production is seen to be one of the most profitable business known.

E-ISSN 3027-215I P-ISSN 3026-9482

diet A perform better than other treatments. However, processing methods used in other treatment might have affected the nutrient composition and feed intake in that treatments. In order to effectively conclude, further research is needed on the different processing temperature and time.

Key word. Broiler, poultry, performance, commercial feed, self-formulated feed.

However, there are so many challenges as there is competition between poultry and human in term of raw material used as feed such as maize, sorghum, and other grain crops (David Farell 2019 and FAO 2013). As a consequence, feed ingredients need to be acquired from distant supply area and may not be hundred percent (100%) sufficient in nutrients content and also very expensive (Nyoupayou 1990). Comparative trials have been conducted on the use of commercially formulated feeds and the locally produced feed to find out the most efficient form of feed that yields high growth rate and reduce production costs. (Sanusi et al, 2015 and Mc Donald, 1987). This study is aimed to compare the effects of self-formulated and commercially prepared broiler feed on growth performances of a broiler chicken.

Materials and Methods

Subjects and Husbandry of Birds

In order to evaluate the performance of the feeds used, five hundreds (500) day old broilers were ordered from a commercial hatchery (Zartech) in plateau state. A total number of 500 chicks was needed for the trial but additional chicks were included so as to replace the number of birds that died during transportation. Prior to the distribution of birds in the pen, birds with signs of ill-health and unusual size were removed from the population when inspected and weighted using a top pan balance. Birds within the range of 39g and 42g was used for the trial for a uniform growth. Prior to the bird's arrival, the study room were cleaned, disinfected and pre-heated using heater. The trial room were partitioned, 5cm depth wood shaving was used as bedding material to regulate welfare issues such as footpad dermatitis. Pens were labelled as A, B, C, D and E. The 5 treatments were fed with self-formulated and commercial feed inclusion of appropriate treatments in the starter and finishers diets. *Ad libitum* feed and water were provided to birds using feeding troughs and nipple drinker respectively. Birds were managed using controlled temperature and ventilation

which are regulated according to behavioural changes and the age of the birds as recommended by animal welfare act 2006. Lighting of the study room was provided according to the age of the birds as recommended by animal welfare regulations. Records of daily temperature and humidity in the trial room will maintained, health check and behavioural monitoring was maintained twice daily so as to assess the welfare of the birds. Weekly performance of the birds were determined by measuring the feed intake (FI) body weight gain (BWG), feed conversion ratio (FCR). Data collected were analysed using ANOVA in IBM SPSS (version 23), confidence and significant level were set at 95% and ($p < 0.05$) respectively.

Table 1: Composition of broiler starter diets containing differently processed Soya bean

Treatment (%)

Ingredient	**A**	**B**	**C**	**D**	**E**
Maize		60	26.	26.	26
Maize bran	-	0	30	30	30
Local fish meal	-	0	7	7	7
Soyabean meal (full fat)	-	34.43	0	0	0
Toasted soya bean	-	0	10	0	0
Full fat soyabean	-	0	0	10	0
Boiled soya bean	-	0	0	0	10
L-lysine HCL	-	0.25	1.5	1.5	1.5
Premix	-	0.52	10	0	0
DL-methionine	-	0.35	1.0	1.0	1.0
Bone meal	-	2.18	4.1	4.1	4.1
Salt	-	0.43	0.3	0.3	0.3
Total		**100**	**100**	**100**	**100**
Calculated Analysis-	**-**				
ME (Kcal/kg)	-	3084.20	3152.6	3152.7	3035.8
CP	-	24.36	25.3	24.4	24.3
CF	-	3.50	3.9	5.1	4.6
Fat	-	3.42	9.1	8.6	8.3
Lysine	-	1.4	2.1	2.1	2.1
Meth	-	0.69	1.2	1.2	1.2

E-ISSN 3027-2151 P-ISSN 3026-9482

Table 2: Composition of broiler finisher diets containing differently processed soya bean

Ingredient	T1	T2	T3	T4	T5
	Treatment (%)				
Maize	-	65.46	22.0	22.0	22.0
Maize bran	-	0	36.1	36.1	36.1
Local fish meal	-	0	1.3	1.3	1.3
Soyabean meal (full fat)	-	27.29	25	25	25
Toasted defatted BSFL	-	0	10	0	0
Full fat soya bean	-	0	0	10	0
Boiled soya bean	-	0	0	0	10
DL-methionine		0.35	0.03	0.03	0.03
Bone meal	-	0	5.1	5.1	5.1
Salt	-	0.40	0.3	0.3	0.3
Total	**-**	**100**	**100**	**100**	**100**
Calculated Analysis	**-**				
ME (Kcal/kg)	-	3226.90	3024.1	3024.232	3005.60
CP	-	17.73	21.1	20.1	20.0
CF	-	3.30	4.6	5.8	5.3
Fat	-	3.41	8.6	8.2	7.8
Lysine	-	1.11	0.7	0.7	0.7
Meth	-	0.55	0.2	0.2	0.2

RESULTS AND DISCUSSION

RESULTS

The result in this study showed that there is no significance difference ($p>0.05$) found on the Body weight of chickens in all the treatments as shown in the Table 3. Although, a higher body weight (BW) of (739g and 705.50g) was found in treatment A and E respectively as compared to birds on other treatment at the starter phase. the value for the initial body weight and average body weight gain of birds in treatment A, D and E at starter phase (40.67g, 40.30g and 40.67g) and (359g,252g and 240g) are higher compared to other treatments as well as in the starter phase. As also shown in table 3, the value of the FI survival rate in treatment A,D and E (718g, 672g and 680g) and (97%, 96% and 97%) respectively were also higher compared to other treatments in this study.

Although there is no significant difference (p>0.05) were found on feed conversion ratio at the starter phase However, treatment C (0.94) shows a better FCR compared to other throughout the research.

The results of the effects of the experimental diets on the growth performance of birds at the finisher phase is presented in Table 4. There is no significance differences found (p>0.05) in all the parameters tested throughout the experiment. Although, the value of for the initial body weight and feed intake in treatment A,D and E (739g, 732.10g and 706.10) and (1441g 1367g and 1325g) respectively is numerically higher compared to other treatment. Similarly, the value for average body weight gain and survival rate in treatment A, D and E (660g, 430.20g and 429g) and (97.20%, 96% and 96.50%) respectively is higher compared to other treatments at the finishing stage during the research trial. However, a relatively fair feed conversion ratio of 2.14 in treatment A was found in finishing phase compared to other treatment in the research.

Table 3: Effects of different experimental diets on growth performance of birds at starter phase

Treatments

Performance	A	B	C	D	E
IBW	40.67	40.14	40.33	40.30	40.67
ABW (g)	739	642	653	700	705.50
FI (g)	718.00	665.00	616.00	672.00	680.00
ABWG (g)	359.00	234.00	204.00	252.00	240
FCR	0.97	1.0	0.94	0.96	0.96
Survl. (%)	97.00	95.00	95.00	96.00	97
P –Value	0.598	0.739	0.722	0.672	0.599

Table 4: Effects of different experimental diets on growth performance of birds at Finisher phase

Treatments

Performance	A	B	C	D	E
IBW	739	648	634	732.10	706.10
FI(g)	1441.00	1305.00	1304	1367.00	1325.00
ABW	2699.0	1900.40	2300.70	2600.10	2520.50
ABWG (g)	660.00	389.00	420.00	430.20	429.00

E-ISSN 3027-215I P-ISSN 3026-9482

FCR	2.14	2.80	3.00	2.86	3.39
SURV (%)	97.20	94.00	94.00	96.00	96.50
P- Value	0.075	0.451	0.764	0.099	0.545

Discussion

From the results obtained in this study, there is an increased growth performance and feed efficiency on broiler chickens fed with treatment A compared to broiler chickens on the other treatments in both starter and finishing phase. This could be attributed to the availability of higher nutrients and high feed intake of in treatments A. the findings of this research are in line with other authors who reported similar findings where a commercially prepared fed perform better than self- formulated feed ((Chohan et al., 1993). Poor performance, low feed intake and low availability of nutrients in feeds observed in other treatments in both starting and finishing stage could be attributed to presents of anti-nutritional factors found in soya beans. (Leeson et al., 1987). A report of Chohan et al., (1993), revealed a poor growth performance when unprocessed soya bean was used on broiler chickens. This could be due to the heat used when processing may not be sufficient to destroy the trypsin inhibitors which consequently affect the growth performance of the chickens. Similarly, in line with the findings of this trial, Ari et al (2012) attributed that steaming method was superior compared to toasting and extrusion.

Conclusion and Recommendation

No significant differences was seen on all the parameters measure throughout the research trial. Birds fed diet A produced the heaviest weight both at the starter and finishers phase compared to other treatments. Similarly, an improved feed conversion ratio and average body weight gain has been observed in birds fed diet A compared to other treatments. Based on the result from the current study, diet A. produced better results. However, processing methods used in other treatment might has affects the nutrient composition and feed intake in that treatments. Further research is needed on the different processing temperature and time in other effectively conclude.

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