

EFFECT OF FEEDING TIME ON THE GROWTH AND MORPHOLOGICAL TRAITS OF ISA BROWN PULLETS

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ABSTRACT

Restricted access to feed at certain period of the day improves markers of metabolic health in animals. This study is aimed at investigating the impact of feeding time on the growth and morphological traits of Isa Brown chicken. Eighty Isa brown pullets at 49 days were divided into two groups of 40 chickens per group with four replicates of 10 chickens per group. The first group represented as G8, were fed at 8.00 hrs while the second group represented as G4, were given feed at 16.00 hrs. Water was given ad-libitum while feeding with commercial grower mash was restricted to 800 g per replicate per day at the specified time. The study lasted for 40 days. The live weight of the chickens was measured on weekly basis using a table top scale of 3 kg maximum capacity. The following linear body traits were measured in centimetre using a tape rule: leg length (LL), thigh length (TL), back length (BL) and wing length (WL). The result of the study showed that the G8 chickens recorded better and higher growth performance than G4 from 14 days till the end of the study. G8 chickens had significantly ($p < 0.05$) longer length for all the linear traits measured except in LL at 49 and 56 days, and BL at 56 and 70 days where G4 chickens had significantly ($p < 0.05$) longer length than G8 chickens. The study concludes that evening (4pm) feeding of Isa Brown chickens was not significantly optimal.

Keywords: Layers, linear traits, feeding, growth, Isa Brown

INTRODUCTION

Growth is a complex and highly dynamic physiological process that begins immediately after a zygote is formed and it continues until maturity (Fayeye *et al*, 2014). Achieving exponential growth from day one till slaughter age is considered an important traits in livestock production with respect to profitability in meat production (Abe *et al.*, 2017). However, there are contributory factors to growth and development in poultry at every stage of growth and these are important to both poultry breeders and meat producers, and among these are body weight and morphometric measurements, (Adeniji and Ayorinde, 1990). Body weight for instance, plays an important role in the determination of several other economically important traits and in determining market price of farm animals (Momoh and Kershima, 2008). While on the other hand, Morphometric traits are the quantitative analyses of the structure, shape, and size of an organism. To achieve optimal growth and development, and reduce feed wastage in poultry production, feeding management procedure like time restricted feeding and feeding flexibility should be critically considered to further encourage non-farmers into farming. Time restricted feeding in poultry is the process where poultry are allowed access to feed for 10 hours or less per day, which has been reported to improve markers of metabolic health in animals (Hatori *et al.*, 2012). It has been further reported that restricted feeding with no caloric restriction provides health benefits and extends longevity (Saibaba *et al.*, 2021). This study therefore, is aimed at investigating the effect of feeding time on the growth and linear measurements of Isa Brown chickens.

MATERIALS AND METHODS

Experimental Site

The experiment was carried out at the Research farm of Aquatech College of Agriculture and Technology, Ibadan. The farm lies within the rain forest ecological zone of the country, and falls within longitude and latitude $7^{\circ}27'$ and $3^{\circ}25'$ respectively, and at altitude of between 200m and 300m above the sea level with an annual rainfall of about 1,250 mm. The temperature and relative humidity ranges from 30° - 35° C and 76-84% respectively (Abe *et al.*, 2019).

Experimental Procedure

Eighty 7-weeks old Isa brown layer chickens were used for the study. The chickens were divided into two groups of 40 chickens per group with four replicates per group. Commercial grower mash feed were fed to the two groups. The first group represented as G8, were fed 8am in the morning while the second group represented as G4, were given feed at 4pm in the evening. The chickens were housed in a wired cage with zinc roofing sheet and covered by net all sides to allow for ample ventilation. Adequate feeders and drinker were provided. Water was given ad-libitum while feeding was restricted to 800g per replicate at the specified time. The experiment lasted for 40 days.

Data Collection and Analysis

The live weight of the chickens was measured on weekly basis using a table top scale of 3 kg maximum capacity. Linear body traits were measured in centimetre using a tape rule. The linear body traits measured were leg length (LL), thigh length (TL), back length (BL) and wing length (WL). These traits were considered because of their market affinity and importance. Data collected were subjected to one-way analysis of variance (ANOVA) using general linear models (GLM) of Statistical Analysis System (SAS 2003). The means were separated using Duncan Multiple Range Test (DMRT) of the same package at Probability level of 0.05.

RESULTS AND DISCUSSION

Figure 1 presented the growth performance of the chickens as influenced by the different feeding time. From the figure, it could be observed that G4 chickens started with a superior weight than G8 chickens. However, after 7 days of the study, the body weight of G8 chickens almost catch up with the G4. The growth curve of G4 chickens was less steep compared to G8 chickens. The G8 chickens recorded better and higher growth performance than G4 at 14 days till the end of the study. This could be due to the effect of temperature changes because the day gets hotter few hours after 8.00 hrs as compared to 16 hrs of the day, thus, more feeds are directed to meat deposition during hot period as opposed to cool time of the day where more feeds are used for body heat production and maintenance. The growth curve of G4 as seen in the figure was less steep than G8 with lower standard deviation from the mean of the data.



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G4	6.05 ±0.69 ^b	12.45 ±1.98 ^b	16.05 ±1.35 ^a	35.05 ±3.36 ^a
77 days				
G8	6.15 ±1.09 ^a	13.30 ±1.64 ^a	16.80 ±1.86 ^a	37.15 ±6.70 ^a
G4	6.10 ±0.82 ^a	12.75 ±1.90 ^b	15.95 ±1.53 ^b	37.00 ±3.48 ^a
84 days				
G8	6.25 ±1.10 ^a	13.45 ±1.70 ^a	17.25 ±2.16 ^a	38.95 ±7.96 ^a
G4	6.18 ±0.81 ^b	12.80 ±1.86 ^b	16.80 ±1.72 ^b	38.15 ±3.93 ^a

^{a,b} means with the same superscript in columns are not significantly different (P<0.05)

G8 = 8.00hrs feeding time; G4 = 16.00hrs feeding time;

LL = leg length; TL = thigh length; WL = wing length; BL = back length

Presented in Table 2 is the pooled mean value for linear traits measurement at different feeding time. From the table, it could be seen that G8 had the superior length in all the linear traits measured. The highest percentage increase of 3.7 was recorded in TL followed by WL. The SD and the range as shown in the table revealed that there was high variation between the individual lengths for all the traits measured in G8 when compared to the values recorded in G4. This further point to the fact that higher growth were recorded in G8 than G4.

Table 2 Pooled mean value for linear traits measurement at different feeding time

Parameter	Time	Mean	SD	Range	
				Minimum	Maximum
LL	G8	6.07	0.24	5.20	6.30
	G4	6.04	0.14	5.80	6.20
TL	G8	12.78	0.38	12.00	13.50
	G4	12.16	0.29	11.50	12.70
WL	G8	15.70	0.42	14.80	16.30
	G4	15.14	0.33	14.70	15.80
BL	G8	33.09	1.51	27.70	35.00
	G4	32.81	0.61	31.30	34.00

G8 = 8.00hrs feeding time; G4 = 16.00hrs feeding time; SD = Standard deviation

LL = leg length; TL = thigh length; WL = wing length; BL = back length

CONCLUSION AND RECOMMENDATION

Feeding time in Isa Brown chickens showed significant (P<0.05) difference. Various environmental factors like temperature of the day, hormonal changes, sleep e.t.c. may have contributed to this differences recorded between 8.00hrs and 16hrs feeding time. 8.00hrs feeding produced the superior weight in Isa Brown chickens.

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