

## GROWTH PERFORMANCE OF THREE STRAINS OF LAYING CHICKENS IN A SEMI-ARID REGION OF NIGERIA

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### ABSTRACT

A total of 550 birds comprising of Noiler and Silver brown 200 for each while the remaining 150 Bovan brown were used for the study. Data were collected on each bird on weekly basis from week one to twentieth week. Body weight were significant ( $P < 0.05$ ) across all ages. The result revealed that the growth performance of Noiler was significantly higher (3128g) than Bovans brown (1819.20g) and Silver brown (1797.80g) at 20<sup>th</sup> week.

Key words: Noiler, Bovans brown, Silver brown, growth performance, body weight.

### INTRODUCTION

Livestock keeping is an essential part of the Nigerian society and economy, as it contributes to man livelihood in terms of food, employment, transport, draft power, manure, savings and insurance and social status (FAO, 2018). About 13 million households keep farm animals and the sector contributes 6 to 8 percent of the National Gross Domestic Product. Nigeria has the second largest chicken population in Africa after South Africa. The Nigerian poultry industry comprises about 180 million birds, 80 million of which are raised in extensive systems, 60 million in semi-intensive and the remaining 40 million in intensive systems (FAO, 2018).

Growth being one of the major characteristics of all living organism, involves dynamic physiological changes which commences when the zygote is formed at the moment of fertilization and continues till maturity of the individual (Olerefuh *et al.* 2017). Growth is the result of an animal gaining weight with time until it reaches maturity (Porter *et al.*, 2010). The growth of animals is characterized by a sigmoid-type curve with three phases: initial slow growth, a phase of pronounced acceleration, and a period of deceleration, until mature weight is reached (Segura-Correa *et al.*, 2017). Growth performance of an animal is a phenotypic attribute influenced by the environment, to a larger extent and it is a manifestation of the genetic constitution of the animal. Growth aspects in farm animals can be readily appreciated and can be easily subjected to quantification either by weighing or by linear measurements (Lawrence and Fowler, 2012, Oleforuh *et al.*, (2017). The current study was taken to determine the growth performance of three strains of chickens.

### MATERIALS AND METHODS

The study was conducted at the University of Maiduguri Livestock Teaching and Research Farm, Maiduguri, Borno State.

#### Experimental birds and management

A total of 450 day-old birds sourced from two reputable hatcheries; Amo and Zartech were used for the study. One hundred and fifty day-old chicks each of Noiler and Silver brown strains were sourced from Amo hatchery and the remaining one hundred and fifty Bovan brown day old chicks sourced from Zartech Hatchery. The day-old chicks were identified by tagging with indelible marker pen and brooded together. The birds were fed commercial starter mash containing 2800 kcal ME/Kg and 21% Crude Protein (CP) from 0-8 weeks. Clean water was given ad libitum. They were all vaccinated against New castle disease and Vitamin supplements were also given to ensure good health and improved egg production.

#### Body measurements

The bodyweight were collected on weekly basis body weight measured in gram with a digital scale.

The appropriate statistical model used is

$$Y_{ik} = \mu + A_i + L_k + e_{ik}$$

Where;  $Y_{ik}$  = observation of the individual bird

$\mu$  = Population mean

$A_i$  = Fixed effect of age ( $i = 1^{\text{st}}, 2^{\text{nd}}, 3^{\text{rd}}, 4^{\text{th}}, 5^{\text{th}}, 6^{\text{th}}, \dots, 20^{\text{th}}$  week)

$L_k$  = Fixed effect of strain ( $k = 1, 2, 3$ )

$e_{ik}$  = Random Error

#### **Statistical analysis**

All data generated were subjected to analysis using statistix 9.0 and significant means were separated using Least Significant Difference

### **RESULTS**

The table showed the least square means of bodyweight for Noiler, Silver brown and Bovans brown chickens from 1-20 weeks of age. Strains had significant ( $P < 0.05$ ) effect in all the ages of study. The result revealed that Noiler strain had the heaviest bodyweight and were significantly ( $P < 0.05$ ) different across all ages among the three strains of chickens. However, despite the variation in mean bodyweight between Silver brown and Bovans brown from one to twenty weeks of age, there was no statistical difference between them.

### **DISCUSSION**

The variation in growth rate observed among the three strains at weekly interval is an indication that strains have different genetic potentials for growth and the strains have different ancestors. Increase in bodyweight of each strain as growth advances in age is an indication that age is a major determinant of growth and physiological development, such variation in growth performance among the three strains of chickens could be utilized in genetic improvement of growth through selection. The findings of the current study are consistent with the reports of Ojedapo (2008) who reported marked strain and breed differences for bodyweight. According to the reports of Ojedapo *et al.* (2008) chickens reared in derived savannah zone of Nigeria mean bodyweight for Nera black (1237g), Brown shaver (978g), Black shaver (983g) which were lower than the current findings of this study. Furthermore, the mean bodyweight obtained in this study were also higher than the reports of Olawumi (2011) on three breeds of commercial layers in derived savannah zone of Nigeria at 20 weeks of age for Isa brown (1422g), Bovans Nera (1499g) and Dominant black (1412g). However the mean bodyweight reported in this study were lower than the result obtained by Melesse *et al.* (2018) for three strains of chickens reared in midland agro ecological zone of Ethiopia for Bovans brown (3.13kg), Sasso (3.19kg) and Keokok (3.17kg) respectively.

**Table 1** Least square means of body weight in three strains of chickens

| Age | Noiler               | Silver brown         | Bovans brown         | SEM   |
|-----|----------------------|----------------------|----------------------|-------|
| 1   | 59.29 <sup>a</sup>   | 52.40 <sup>b</sup>   | 51.49 <sup>b</sup>   | 1.16  |
| 2   | 131.23 <sup>a</sup>  | 108.37 <sup>b</sup>  | 108.36 <sup>b</sup>  | 2.27  |
| 3   | 259.00 <sup>a</sup>  | 201.33 <sup>b</sup>  | 194.61 <sup>b</sup>  | 4.48  |
| 4   | 431.81 <sup>a</sup>  | 294.40 <sup>b</sup>  | 278.30 <sup>b</sup>  | 7.05  |
| 5   | 588.47 <sup>a</sup>  | 381.70 <sup>b</sup>  | 373.92 <sup>b</sup>  | 9.88  |
| 6   | 793.13 <sup>a</sup>  | 467.87 <sup>b</sup>  | 477.46 <sup>b</sup>  | 11.09 |
| 8   | 1068.80 <sup>a</sup> | 652.00 <sup>b</sup>  | 659.06 <sup>b</sup>  | 14.61 |
| 10  | 1413.30 <sup>a</sup> | 829.80 <sup>b</sup>  | 848.27 <sup>b</sup>  | 19.51 |
| 12  | 1742.10 <sup>a</sup> | 1019.50 <sup>b</sup> | 1030.50 <sup>b</sup> | 24.82 |
| 13  | 1916.70 <sup>a</sup> | 1114.80 <sup>b</sup> | 1131.00 <sup>b</sup> | 28.26 |
| 14  | 2092.50 <sup>a</sup> | 1208.90 <sup>b</sup> | 1227.2 <sup>b</sup>  | 31.95 |
| 15  | 2272.40 <sup>a</sup> | 1296.70 <sup>b</sup> | 1332.1 <sup>b</sup>  | 34.38 |
| 16  | 2442.60 <sup>a</sup> | 1394.80 <sup>b</sup> | 1430.80 <sup>b</sup> | 36.66 |
| 17  | 2607.10 <sup>a</sup> | 1498.50 <sup>b</sup> | 1522.50 <sup>b</sup> | 38.60 |
| 18  | 2785.30 <sup>a</sup> | 1598.6 <sup>b</sup>  | 1623.20 <sup>b</sup> | 40.31 |
| 19  | 2949.60 <sup>a</sup> | 1693.7 <sup>b</sup>  | 1722.4 <sup>b</sup>  | 41.30 |
| 20  | 3128.40 <sup>a</sup> | 1797.80 <sup>b</sup> | 1819.20 <sup>b</sup> | 43.34 |

Means (a,b) within row with different superscripts are significantly different (P<0.05)

## CONCLUSION

From the results obtained in this study, it was found that Noiler chickens tend to have higher bodyweight among the three strains of chickens and hence it can be use for both meat and egg production.

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