



EFFECT OF SEX AND STRAIN ON GROWTH PERFORMANCE OF NIGERIAN INDIGENOUS CHICKENS (FUNAAB ALPHA AND YORUBA ECOTYPE)

Adewole F. A^{1*}, Adeyemi, O.A.², Bello, K. O.¹, Lala, A. O.¹, Famakinde S. A.¹, Sanusi, Y. T.²
and Egbeyale, L.T.²,

¹Institute of Food Security, Environment Resources and Agricultural Research,

²Department of Animal Production and Health, Federal University of Agriculture, Abeokuta

*** Corresponding author. Tel.:** +2348027170579, +2349069175311

E mail address: adewolefaith@yahoo.com

Abstract

A thirteen week experiment was conducted to determine the effect of sex and strain on the growth performance of Nigerian indigenous chickens (FUNAAB Alpha and Yoruba ecotype). One hundred and twenty chickens comprising thirty (30) each of FUNAAB Alpha males, FUNAAB Alpha females, Yoruba ecotype males and Yoruba ecotype females were assigned to four treatments arranged in a 2 x 2 factorial arrangement. Significantly ($p < 0.05$) higher final weight (1955.56g), the daily weight gain (14.95g), the daily feed intake (91.18g) and better feed conversion ratio (FCR) (6.20) were observed with the FUNAAB Alpha over the Yoruba ecotype chicken breed with 992.38g, 7.81g, 58.39g and 7.64 respectively.. Similarly, sex significantly ($p < 0.05$) increased the final weight, the daily weight gain, the daily feed intake of male indigenous chicken with better feed conversion ratio than their female counterparts. However, the female FUNAAB alpha chicken recorded significantly ($p < 0.05$) higher final weight (1714.82g), the daily weight gain (12.49g), the daily feed (82.44g) and better FCR (6.66) than both the male and female Yoruba ecotype while the Yoruba ecotype females recoded the least performance. It could be concluded that sex and strain has significant effect on the growth performance of indigenous chicken.

Keywords: FUNAAB alpha, Yoruba ecotype, sex, strain, growth performance,

Introduction

Poultry meat and egg consumption is vital in meeting the human daily protein requirements. Demand for poultry meat is higher because of its perceived superiority in health aspects when compared to red meat. The meat has comparably low contents of fat and cholesterol (Jaturashita, 2004). There is therefore the need to encourage increased production and consumption of chicken in Nigeria. The poultry industry in Nigeria is majorly composed of indigenous village scavenger breeds and high performing exotic breeds. According to Sil *et al.* (2002), the exotic breeds are not resistant to most of the endemic poultry diseases as their counterpart indigenous breeds do. The indigenous chickens are however, well adapted to the environment. Ogundipe *et al.* (1999) reported that, the advantage of having a stock that was developed locally includes ability to exhibit a greater adaptation to the environment than the imported stock. These indigenous chickens are also preferred by rural and urban dwellers for their more flavoured and tough textured meat, good quality eggs and other reasons. LeBehan–Dual (2004) reported that, many consumers prefer the local chicken to the exotic ones due to its leanness and relatively low price. In Nigeria, various ecotype have been reported. Forest or Yoruba ecotype and savannah or Fulani ecotype according



to Olori (1992). Through crossbreeding and intensive selection over many generations some chicken populations have also been developed in Nigeria including the FUNAAB Alpha at the Federal University of Agriculture of Agriculture, Abeokuta, for improved meat and egg production without sacrificing adaptation to tropical environment characterized with heat stress and infectious diseases (Ilori *et al.*, 2016).

According to Assan (2015), the knowledge of growth performance is essential in poultry production being fundamental attributes for assessing growth and feed efficiency as well as important yardstick in management and economic decision making. A number of factors such as nutrition, growth rate, sex and age have been reported to affect growth response (Omeje and Nwosu, 1983). Among all these factors, according to Sola-Ojo *et al.* (2012), sex has greatest impact on the possibility of genetically improving growth response. Therefore this study is aimed to determine the effect of sex and strain on growth performance of Nigerian indigenous chickens (FUNAAB alpha and Yoruba ecotype).

MATERIALS AND METHODS

Experimental site: The study was carried out at the poultry Unit of the Institute of Food Security, Environmental Resources and Agricultural Research, Federal University of Agriculture, Abeokuta. The farm is located in the derived savanna region with an average temperature of 38°C and a relative humidity of 38%. It is in the region 70m above sea level of latitude 7° 53'N and longitude 3° 20'E. It receives a mean precipitation of 1037mm per annum.

Experimental birds and management: One hundred and twenty day-old chicks comprising thirty (30) chicks each of FUNAAB alpha males, FUNAAB alpha females, Yoruba ecotype males and Yoruba ecotype females. These indigenous chickens were all sourced from the University's hatchery. The birds were raised under the intensive system of management using deep litter system. Sexing was done at the end of the chick phase (8 weeks), when the distinguishing characteristics especially comb was obvious. Commercial feed was used throughout the period of experiment and was adjusted from chick mash to grower mash after 8-week. Clean water from deep well was used and supplied every day. Water troughs were cleaned every day. All necessary vaccination and medication were provided as at when due.

Data collection on growth performance: The data on weekly feed consumption, weekly body weight and final body weight in grams were determined using weighing scale. Weight gain and feed conversion ratio (FCR) were determined as followed;

Weight gain = final weight – initial weight

$$FCR = \frac{\text{Feed intake}}{\text{Weight gain}}$$

Statistical analysis: The experimental layout was a 2x2 factorial arrangement. The data collected were subjected to Analysis of Variance (ANOVA) using SAS 2012. Significant ($p < 0.05$) means among variables were separated using Duncan Multiple Range Test of the software.



Results and Discussion

The main effect of strain and sex on growth performance of the Nigerian indigenous chickens is presented in Table 1. Strain has Significant ($P<0.05$) effect on the final weight, the daily weight gain, daily feed intake and the feed conversion ratio of the birds. FUNAAB alpha recorded significantly ($P<0.05$) higher values in final weight, daily weight gain and feed intake. The feed conversion ratio of FUNAAB alpha is also better. The poor performance of the Yoruba ecotype chickens could be as a result of their genetic make-up for their adaptability to tropical environment (Olawunmi *et al.* 2008). FUNAAB alpha, through crossbreeding and intensive selection over many generations, have been developed for improved meat and egg production without sacrificing adaptation to tropical environment characterized with heat stress and infectious diseases (Ilori *et al.*, 2016). The growth performance of FUNAAB Alpha showed that the strain can be grouped as heavy ecotype chicken Momoh (2008), in his work on the growth performance of Nigerian indigenous chickens, reported that the heavy ecotype (strain) showed significant higher body weights than the light ecotype (strain) at all ages. The final weight, the daily weight gain and the daily feed intake increased significantly ($P<0.05$) in male chicken of both strains than their female counterparts. Similarly, the feed conversion ratio (FCR) of the male birds were better ($P<0.05$). This finding was similar to the findings of Atteh (1990) and Adedokun and Sonaiya (2001), who reported higher performance for the male than female of the Nigerian indigenous chickens in terms of final weight. The difference in the performance of the two sexes may be due to the usual difference between sex differential hormonal actions which invariably leads to differential growth rates as reported by Baeza *et al.* (2001).

Table 1: The main effects of strain and sex on growth performance of the Nigerian indigenous chickens

Parameters	Strain			Sex		
	FUNAAB Alpha	Yoruba ecotype	SEM	Male	Female	SEM
*Initial weight (g)	699.90	335.97	11.76	545.59	490.28	11.76
Final weight (g)	1955.56 ^a	992.38 ^b	84.04	1652.97 ^a	1294.97 ^b	217.08
Daily weight gain (g)	14.95 ^a	7.81 ^b	0.87	13.18 ^a	9.58 ^b	1.63
Daily feed intake (g)	91.18 ^a	58.39 ^b	2.40	79.85 ^a	69.73 ^b	7.37
FCR	6.20 ^b	7.64 ^a	0.37	6.22 ^b	7.62 ^a	0.37

^{ab}; Means with different superscripts along the row are significantly ($P<0.05$) different

* Initial weight was used as covariate



The interaction effect between sex and strain on growth performance of the Nigerian indigenous chickens is presented on Table 2. FUNAAB alpha males recorded the highest ($P < 0.05$) final weight, daily weight gain and feed intake, followed by the FUNAAB alpha females; followed by the village scavenger males while the Yoruba ecotype females had the least performance. However, no significant interaction effect ($P > 0.05$) of the sex and strain was observed on the FCR of the birds. The result of this study in the interaction effect was similar to the finding of Momoh *et al.* (2010) who worked on sexed heavy and light Nigerian local chickens.

Table 2: Interaction effects of strain and sex on growth performance of Nigerian indigenous chickens

Strain	FUNAAB Alpha		Yoruba ecotype		
Sex	Male	Female	Male	Female	SEM
*Initial weight (g)	734.34	665.56	356.94	315.00	16.63
Final weight (g)	2196.30 ^a	1714.82 ^b	1109.63 ^c	875.13 ^d	38.59
Daily weight gain (g)	17.40 ^a	12.49 ^b	8.96 ^c	6.67 ^d	0.49
Daily feed intake (g)	99.93 ^a	82.44 ^b	59.77 ^c	57.02 ^c	0.94
FCR	5.75 ^b	6.66 ^b	6.70 ^b	8.58 ^a	0.29

abcd; Means with different superscripts along the row are significantly ($P < 0.05$) different

* Initial weight was used as covariate

Conclusion

The sex and strain significantly affected the final live weight, the daily weight gain and the daily feed intake of the Nigerian indigenous chickens. However, only the sex had significant effect on the feed conversion ratio of the birds.

References

- Adedokun, S.A., and Sonaiya, E.B. (2001).** Comparison of the performance of Nigerian indigenous chickens from three agro ecological zones. *Livestock research for rural development* 3(2). 34 – 39.
- Assan, N. (2015).** Methodology and factors influencing the association of body weight, performance parameters with linear body measurements assessment in poultry. *Scientific Journal of Pure and Applied Sciences*, 4: 200 – 210.
- Atteh, J.O. (1990).** Rural poultry production in western middle-belt region of Nigeria in rural poultry production in Africa. Ed. Sonaiya, E.B. Proceedings of an international workshop on rural poultry in Africa. Ile-Ife Nigeria. 13-16 November, 1989. 211 – 217.
- Baeza, E. J., Williams, D., Guemene and Duclos, M.J. (2001).** Sexual dimorphism for growth in Muscovy duck and changes in Insulin-Like Growth Factor I (IGF- I), Growth Hormone (GH) and triiodothyronine (T3) plasma levels. *Reproduction Development*, 41: 173-179.



- Ilori, B. M., Wheto, M., Durosaro, S. O., Akano, K., Adebambo, O. A. and Adebambo, A. O. (2016).** Polymorphism of *IGF-1* Promoter and the UTR Regions of Nigerian Locally Adapted Chickens. *Journal of Biology, Agriculture and Healthcare*. 6(10): 2224-3208.
- Jaturashitta, S. (2004).** Meat management. Mingnuang press, Chiang Mai, Thailand.
- LeBehan – Dual, E., (2004).** Genetic variability within and between breeds of poultry technological meat quality. *World Poultry Science Journal*, 60: 331-340.
- Momoh, O. M. and Nwosu, C. C. (2008).** Genetic evaluation of growth rates in crosses between two ecotypes of Nigerian local chicken. *Livestock Research for Rural Development* 20(10).
- Momoh OM, Ani AO, Ugwuowo LC (2010).** Part-period Egg Production and Egg Quality Characteristics of Two Ecotypes of Nigerian Local Chickens and Their F1 Crosses. *Int. J. Poult. Sci.* 9(8): 744-748, 2010 ISSN 1682-8356.
- Ogundipe, S.O., Oni,O.O., Sekoni, A.A., Abubakar, B.V., Adeyinka, I.A and Nwogu, B.I. (1999).** The development of foundation layer stock for the Nigerian commercial egg production industry. Paper presented for public lecture delivered at the 20th Anniversary of Animal care konsult (Nig.) Limited, held at Sheraton Hotels. Thurs. 9, Dec. 1999.
- Olawunmi, O. O., Salako, A. E. and Afuwape, A. A. (2008).** Morphometric differentiation and assessment of function of the Fulani and Yoruba ecotype indigenous chickens of Nigeria. *International Journal Morphology*, 26(4): 975-980.
- Olori, V.E., (1992).** An evaluation of two ecotypes of the Nigerian Indigenous chicken. M.Sc. Thesis, OAU Ile Ife.
- Omeje, S.S.I and C.C. Nwosu, (1983).** Egg production patterns in local chickens and their crosses in short term. *Nigeria Journal of Animal Production*, 10: 91-96.
- SAS, 2000. Institute Inc. SAS Technical Report Package 234 SAS/STAT Software. The GEMOD Procedure. Release 6.09.SAS Institutes Inc. Cary, NC. USA.
- Sil, G.C., Das P.M., Islam M.R., and Rahman M.M., (2002).** Management and disease problems of cockerels in some farms of Mymensingh, Bangladesh. *International Journal of Poultry Science*, 1: 102-105.
- Sola-Ojo, F.E., Ayorinde, K.L., Bolu, S.A.O., Toyé, A.A., Kayode, R.M.O., Alli, O.I., Adeyemi, K.D. and Gomina, P. (2012).** Sexual Dimorphism in Growth Traits and Carcass Characteristics in the Nigerian Fulani Ecotype Chicken. *American-Eurasian Journal of Sustainable Agriculture*, 5(3): 371-377.
- Sonaiya, E.B., (1990).** The context and prospects for development of small holder rural poultry production in Africa. Proceeding CTA International Seminal Small Holder Rural Poultry Production, 1: 35-52