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COMPARATIVE EVALUATION OF GROWTH PERFORMANCE OF NIGERIAN INDIGENOUS, FUNAAB ALPHA AND BRAHMA CHICKENS

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ABSTRACT
This study was carried out on Nigerian indigenous, FUNAAB Alpha and Brahma chicken at the poultry breeding unit of the Teaching and Research farm of College of Animal Science and Livestock Production, Federal University of Agriculture Abeokuta, Ogun State Nigeria. The aim of the study was to evaluate the growth performance of the Nigerian indigenous, FUNAAB Alpha and Brahma chicken. A total of 150 birds were used for this experiment comprising 50 Nigerian indigenous, 50 FUNAAB Alpha and 50 Brahma chicken. Growth parameters such as body weight, shank length, breast girth and keel length were collected on a 14-day interval for a period of 13 weeks. Growth data collected were analyzed using two-way analysis of variance (ANOVA) of SAS 9.2 and the relationship between measured growth parameters of the three chicken breeds were determined using Pearson correlation. The results showed that body weight and other linear body measurements of birds increased as age advanced with Braham chicken performing better followed by the FUNAAB Alpha chicken while the Nigerian indigenous chicken had the lowest performance. High to moderate correlations ranging from 0.99 to 0.47 were observed between body weight and other linear body measurement indicating a strong association between body weight and other body measurement.

INTRODUCTION
Growth is one of the major characteristics of all living organism. It involves dynamic physiological changes which commences when the zygote is formed at the moment of fertilization and continues till maturity of the individual. Kor *et al.* (2006) noted that growth in all animals apart from relating to increase in body cells and volume is a complex process controlled by both genetic and non-genetic factors. Body weight is usually used as a measure of growth in farm animals; however numerous studies have shown that other growth traits relating to body morphometric measurements such as body length, shank length and chest girth can serve as good indicators of growth (Ige, 2013). The Nigerian local chicken (NLC) plays very significant roles in the socio-cultural and economic life of the rural populace in addition to acting as a buffer to scarcity of poultry and poultry products. Momoh and Kershima, (2008) reported that the NLC are classified into light and heavy weight genotype based their growth and body weight characteristics. Brahma chicken has the advantage of being a dual-purpose chicken and is frequently dependable within the generation of meat in numerous nations of the world (Lyimo *et al.*, 2014).

MATERIALS AND METHODS
Experimental site
The research was conducted at the poultry Breeding unit of the Teaching and Research Farm of College of Animal Science and Livestock Production, University of Agriculture Alabata road, Abeokuta Nigeria. Alabata (7^0 10^0 and 3^0 2^0 E) is in Odeda Local government area of Ogun State.

Experimental birds
A total of 150 birds consisting 50 Nigerian indigenous, 50 FUNAAB Alpha chicken and 50 Brahma chicken were used for the experiment. The chicken was raised on an intensive system of production

using deep litter housing system. Feeds and water were administered ad-*libitum*. Data such as body weight, shank length, breast girth and keel length were collected at day 1, 17, 31, 45, 59, 73 and 89.

Statistical Analysis

All Data collected were subjected to two-way analysis of variance (ANOVA) using SAS 9.2 and significant means were separated using Duncan Multiple Range Test of the same package.

RESULTS

The Effect of genotype on body weight and the linear body measurement of FUNAAB Alpha chicken, Nigerian indigenous chicken and Brahma chicken are shown in Table 1. The result showed that genotype was significantly different ($p< 0.05$) in body weight (BW) of the three genotypes in all the days experimental data was collected except on day 17 with the Braham chicken have the highest body weight and other linear body measurements followed by the FUNAAB Alpha chicken. Genotype has significant ($p< 0.05$) effect on keel length (KL) at day 31, 45, 59, 73 and 89 whereas for shank length (SL), the genotype shown significant effect ($p< 0.05$) for every other day except day 1. For breast girth (BG) the effect of genotype was significant at day 45, 59, 73 and 89.

Table 1: *Effect of genotype on body weight and the linear body measurement of FUNAAB Alpha chicken (FAC), Nigerian indigenous chicken and Brahma chicken*

Days	Genotype	BW (kg)	KL (cm)	SL (cm)	BG (cm)
1	BC	31.36±0.26^{a}			
	FAC	28.05±0.70^{b}			
	NIC	27.83±0.94^{b}			
17	BC	92.60± 6.28	5.42±0.13	4.05±0.09^{a}	13.25±0.68
	FAC	85.16± 4.47	4.92±0.15	3.69±0.07^{b}	14.75±0.48
	NIC	80.45± 6.73	5.06±0.15	3.71±0.07^{b}	14.34±0.73
31	BC	263.57±8.17^{a}	6.53±0.07^{a}	4.55±0.09^{a}	16.17± 0.58
	FAC	243.48±11.39^{a}	5.77± 0.12^{b}	3.92± 0.06^{b}	16.95±0.41
	NIC	203.73±11.06^{b}	5.57±0.11^{b}	3.66±0.07^{c}	15.71±0.62
45	BC	490.51±18.88^{a}	8.53±0.12^{a}	6.58±0.13^{a}	19.66±0.54^{a}
	FAC	397.24±19.70^{b}	6.87±0.15^{b}	5.14±0.11^{b}	18.60±0.39^{b}
	NIC	328.26±16.07^{c}	6.57±0.14^{c}	4.86±0.09^{b}	17.61±0.58^{c}
59	BC	610.58±17.77^{a}	9.99±0.14^{a}	7.38±0.10^{a}	23.19±0.50^{a}
	FAC	510.70±22.56^{b}	8.56±0.16^{b}	6.81±0.10^{b}	20.61±0.36^{bc}
	NIC	421.58±16.38^{c}	8.04±0.17^{c}	6.44±0.15^{c}	19.65±0.54^{cb}
73	BC	692.43±19.78^{a}	10.37±0.13^{a}	7.48±0.09^{a}	24.62±0.54^{a}
	FAC	613.24±25.96^{ab}	9.48±0.16^{b}	7.31±0.11^{a}	24.49±0.39^{a}
	NIC	484.72±25.00^{b}	8.67±0.18^{c}	6.84±0.12^{b}	21.82±0.58^{b}
89	BC	795.88±23.28^{a}	10.78±0.13^{a}	8.19±0.14^{a}	66.21±8.05^{a}
	FAC	685.11±30.91^{a}	9.56±0.16^{b}	7.43±0.11^{a}	24.68±5.73^{b}
	NIC	556.96±35.63^{b}	8.88±0.22^{c}	6.84±0.12^{b}	22.29±8.64^{c}

^{abc} Means with different superscripts are significantly different ($p< 0.05$)

Relationship among the growth traits measured in FUNAAB Alpha chicken, Nigerian indigenous chicken and Brahma chicken is shown in table 2. Body weight had high to moderate and positive correlation with all linear body measurements in the three chicken genotypes used in the research. Body weight and linear body measurement KL SL and BG had a high and positive correlation with each other in the FUNAAB Alpha and Nigerian indigenous chicken where as in Brahma chicken, body weight has a high and positive correlation with KL and SL while a moderate correlation was in BG with BW, KL and SL.

Table 2: *Relationship among the growth traits measured in FUNAAB Alpha chicken, Nigerian indigenous chicken and Brahma chicken*

	BW (kg)	KL (cm)	SL (cm)	BG (cm)
BRAHMA CHICKEN (BC)				
BW (kg)				
KL (cm)	0.89***			
SL (cm)	0.90***	0.99***		
BG (cm)	0.50***	0.48***	0.47***	
FUNAAB ALPHA CHICKEN (FAC)				
BW (kg)				
KL (cm)	0.90***			
SL (cm)	0.90***	0.99***		
BG (cm)	0.85***	0.97***	0.96***	
NIGERIAN INDIGENOUS CHICKEN (NIC)				
BW (kg)				
KL (cm)	0.87***			
SL (cm)	0.88***	0.98***		
BG (cm)	0.83***	0.98***	0.95***	

***= highly significant at <.0001

DISCUSSION

The results of the present study revealed that body weight and other linear body measurements of birds increased as age advanced with the BC having the highest values followed by the FAC and NIC had the lowest values. The excellent performance seen in BC and FAC was due to the fact that the BC and FAC had gone through selections and general improvement; the lower body weight and linear body measurements reported for the NIC is expected since our local poultry have gone through more of natural selection (Ibe, 1998). At day 59 which is equivalent to 8 weeks, effect of genotype on the linear body parameter (KL, SL and BG) of the three chicken genotypes were, 9.99cm, 7.38cm and 23.19cm for BC, 8.56cm, 6.81cm and 20.61cm for FAC and 8.04cm, 6.44cm and 19.65cm for the NIC. This result corroborates the findings of Sola-Ojo *et al*. (2020).

Results revealed a positive and significant correlation between body weight and other linear body measurement. This implies that there exists a strong linear relationship between body weight and keel length, shank length and breast girth and that as body weight increase, other body measurements also increased (Egena, 2014). Therefore, an improvement in body weight of chickens would lead to an improvement in linear body measurement. Ajayi *et al.* (2008) reported that an increase in any of the body measurement will invariably lead to a corresponding increase in body weight of chicken. A high to moderate correlation coefficients ranging from 0.99 to 0.47 was also observed in this study. Adeleke *et al*. (2011) reported a genetic correlation between growth traits in pure and crossbred progenies of Nigerian indigenous chicken to range from 0.99 to 0.43 which is in the same range as observed in our study. This result corroborates the reports of Yahaya *et al*., (2012) and Alabi *et al*.

(2012) that high positive correlation exists between body weight and linear body measurements in broilers and naked neck/venda chickens of South Africa, respectively.

CONCLUSION

From this study, Brahma chicken and FUNAAB Alpha chicken have been seen to exhibit significant higher body weight and body measurements over Nigerian indigenous chicken. High positive correlations between body weight and linear body measurements implies that an improvement in body measurements may lead to an improvement in body weight. This relationship may be used in selection programme for genetic improvement of local, crossbred and commercial broiler chickens.

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