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Comparison of Body Weight and Linear Measurements of Pearland Belgy Strains of Guinea Fowls in Northern Guinea Savanna Zone Of Nigeria

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Abstract
A total of 60 day-old keets from guinea fowl generated from a base population of 60 adult guinea fowls were used to compare and assess the variability of two guinea fowl strains for growth and body linear measurements. Traits measured were body weight, body length, neck length, thigh length, shank length and breast width using a flexible measuring tape. Data obtained from bi-weekly measurements of body weight and body linear measurements were analyzed using General Linear Model Procedure of SAS. Strain of guinea fowl affected body weight and body linear measurement of keets from 2 weeks up to 16 weeks. Belgy strain had higher values for all the traits considered in the study and across all the ages. The body weight of Belgy strain was higher ($p<0.01$) than those of Pearl guinea fowls by almost 16.88% of body weight at 2 weeks which is shown as 69.91±0.00g for Belgy and 53.03±0.00 g for Pearl. The body weight of Belgy strain was heavier ($P<0.01$) than those of Pearl strain by 57.79% with a weight difference of 178.78 g at 16 weeks. Belgy strain showed a greater potential for faster growth rate than Pearl strain. Belgy strain should be incorporated in improvement programme purposed for guinea fowl in Northern Guinea Savannah zone of Nigeria.

Keywords: Guinea Fowls, Pearl and Belgy Strains, keets, Guinea Savanna

Introduction

The guinea fowl (*Numida meleagris*) originated within Africa where today some still remain in their wild form, representing a source of protein and income in rural communities (Dei and Karbo, 2004). Moreover, guinea fowl plays an important role in the socio-cultural livelihood of many tribes (Teye and Adam, 2000). In addition to high protein, guinea fowl meat is also characterized by low fat content, thus it is highly prized compared to chicken meat. The birds are free from most poultry diseases (Moreki and Seabo, 2012). Other advantages of rearing guinea fowl include low production costs, greater capacity for utilization of green feeds, control of ticks and other pests, better ability to protect itself against predators and lower requirements for labor and management (Sayila, 2009).

Phenotypic characteristics are important in identifying and defining breed attributes. Mcainsh *et al*. (2004) stated that phenotypic variation is exactly what characterizes local poultry strain. Body linear measurements help in the comparison of growth in different parts of the body. It has been severally used to characterize strains, evaluate carcass yield, sex effect on performance and predict live weight gain in livestock (Oke *et al.,* 2014). Body linear measurement and its relationship to size and shape have been extensively studied in both large animals and poultry (Ogah, 2011). Body linear measurements have been a recurring interest to livestock production either to supplement body weight as a measure of productivity or as predictors of some less visible characteristics (Sapriyantono *et al*., 2012). To upgrade the productivity for income generation from guinea fowl, the variability in body weight and body linear measurements has to be considered.

This study was therefore aimed at comparing body weight and body linear measurements of Pearl and Belgy strains of guinea fowl in Northern Guinea Savanna zone of Nigeria.

Materials and Methods

The experiment was carried out at the Teaching and Research Farm, Department of Animal Science, Ahmadu Bello University, Zaria. The site is geographically situated between latitude 11°12'N and longitudes 7° and 33'E at an attitude of 640m above sea level (Ovimaps, 2016). Annual rainfall in this area ranges from 1102mm to 1904mm per annum which last from late April or early May to October. The mean temperature fluctuates from 31°C maximum during the dry season to 18°C minimum during the wet season. It is located 22km Northeast of Zaria city and in the Northern Guinea Savannah zone of Nigeria as reported by Kabir (2010).

A total of 60 (30 each) of two distinct strains of Guinea fowl birds (Pearl and Belgy) comprising of 6 males and 24 females each of Pearl and Belgy strains were obtained from Zaria in Kaduna State and Maradi,

Niger Republic, respectively for the study that lasted for 16 weeks. The body linear measurements such as neck length, body length, shank length, thigh length and breast width were taken as described by Fayeye *et al*. (2006). The measurements were taken using a tailor's tape in centimeter.

Data obtained from bi-weekly body weight and linear measurement data were analyzed using General Linear Model Procedure of SAS (SAS, 2004). Means within the traits were separated using Duncan's Multiple Range Test (SAS, 2004).

Results and Discussion

Least square means and standard errors for the traits studied are presented in Table 1. Strains affected ($p<0.01$) all body weight and body linear measurements of guinea fowls. Belgy strain had higher values for all the traits considered in the study and across all the ages. The body weight of Belgy strain was higher ($p<0.01$) than those of Pearl guinea fowls by almost 16.88% of body weight at 2 weeks which is shown as 69.91±0.00g for Belgy and 53.03±0.00g for Pearl. The body of Belgy strain was heavier ($p<0.01$) than that of Pearl strain by 57.79% with a weight difference of 178.78g at 16 weeks. The neck of Belgy strain was longer ($p<0.01$) than that of Pearl guinea fowls by almost 26% of neck length at 2 weeks which is shown as 5.15±0.03cm for Belgy and 4.09±0.03cm for Pearl. The neck of Belgy strain was longer ($p<0.01$) than that of Pearl strain by 45% with a length difference of 4.65cm at 16 weeks. The body of Belgy strain was longer ($p<0.01$) than that of Pearl guinea fowls by almost 17% of body length at 2 weeks which is shown as 12.07±0.12cm for Belgy and 10.32±0.12cm for Pearl. The body of Belgy strain was longer ($p<0.01$) than that of Pearl strain by 26.66% with a length difference of 6.34cm at 16 weeks.

Table 1: Means (±SE), for Body Weight (g) and Body Linear Measurements (cm) in Pearl and Belgy Guinea Fowl Strains at various ages (weeks)

Week	Strain	BWT	NL	BL	THL	SHL	BRWD
2	Belgy	69.91±00^{a}	5.15+0.03^{a}	12.07±0.12^{a}	4.25±0.04^{a}	2.73±0.02^{a}	4.51+0.04^{a}
	Pearl	53.03±00^{b}	4.09+0.03^{b}	10.34±0.12^{b}	4.01±0.04^{b}	2.50+0.02^{b}	4.00±0.04^{b}
	SEM	1.09	0.07	0.14	0.03	0.02	0.04
4	Belgy	174.00±3.86^{a}	6.28±0.06^{a}	15.83+0.21^{a}	5.32+0.07^{a}	2.98±0.01^{a}	5.47±0.07^{a}
	Pearl	86.44±3.86^{b}	5.79+0.06^{b}	13.53±0.21^{b}	5.47±0.07^{b}	2.97±0.01^{b}	5.10±0.07^{b}
	SEM	6.31	0.05	0.21	0.05	0.01	0.05
6	Belgy	266.39±5.35^{a}	8.92±0.09^{a}	20.08±0.22^{a}	7.28±0.09^{a}	3.86±0.05^{a}	7.59±0.10^{a}
	Pearl	111.39±5.35^{b}	6.39±0.09^{b}	15.26±0.22^{b}	6.23±0.09^{b}	3.24±0.05^{b}	6.22±0.10^{b}
	SEM	10.76	0.18	0.35	0.09	0.05	0.11
8	Belgy	334.28±6.5^{a}	10.02±0.2^{a}	23.13±0.23^{a}	8.16±0.08^{a}	4.29±0.05^{a}	8.54±0.11^{a}
	Pearl	152.85±6.5^{b}	6.95±0.12^{b}	16.92±0.23^{b}	6.92±0.08^{b}	3.58±0.05^{b}	7.03±0.11^{b}
	SEM	12.75	0.22	0.44	0.09	0.06	0.12
10	Belgy	378.24±6.7^{a}	10.90±0.2^{a}	24.87±0.25^{a}	9.08±0.10^{a}	4.57±0.06^{a}	8.96±0.10^{a}
	Pearl	205.01±6.87^{b}	7.69±0.12^{b}	18.80±0.25^{b}	7.58±0.10^{b}	3.91±0.06^{b}	7.67±0.10^{b}
	SEM	12.26	0.22	0.43	0.12	0.06	0.11
12	Belgy	419.83±8.02^{a}	11.83±0.13^{a}	25.96±0.23^{a}	9.83±0.10^{a}	4.90±0.56^{a}	9.52+0.09^{a}
	Pearl	257.61±8.02^{b}	8.57±0.13^{b}	20.80±0.23^{b}	8.27±0.10^{b}	4.02±0.56^{b}	8.22±0.09^{b}
	SEM	11.96	0.23	0.37	0.13	0.07	0.11
14	Belgy	443.33±7.78^{a}	12.75±0.12^{a}	27.38±0.22^{a}	10.50±0.10a	5.25±0.08^{a}	9.63±0.91^{a}
	Pearl	279.18±7.78^{b}	9.55±0.12^{b}	22.05±0.22^{b}	8.98±0.10^{b}	4.09±0.08^{b}	8.90±0.91^{b}
	SEM	11.99	0.23	038	0.12	0.09	0.08
16	Belgy	488.13±7.99^{a}	15.05±0.14^{a}	30.12±0.20^{a}	12.52±0.10^{a}	6.55±0.08^{a}	11.22±0.14^{a}
	Pearl	309.35±7.99^{b}	10.40±0.14^{b}	23.78±0.20^{b}	9.97±0.10^{b}	5.05±0.08^{b}	9.94±0.14^{b}
	SEM	12.91	0.32	0.44	0.18	0.11	0.13

BWT = body weight, NL = neck length, BL = body length, SHL= shank length, THL = thigh length, BRWD = breast width, a,b = significant ($p<0.01$) probability level, SEM = standard error of mean

The thigh of Belgy strain was longer ($p<0.01$) than those of Pearl guinea fowls by almost 6% of thigh length at 2 weeks which is shown as 4.25±0.04cm for Belgy and 4.01±0.04cm for Pearl. The thigh of Belgy strain was longer ($P<0.01$) than those of Pearl strain by 25.56% with a length difference of 2.55cm at 16 weeks. The shanks of Belgy strain were longer ($P<0.01$) than those of Pearl guinea fowls by almost 9.2% of shank length at

2 weeks which is shown as 2.73±0.02cm for Belgy and 2.50±0.02cm for Pearl. The shanks of Belgy strain were longer ($p<0.01$) than those of Pearl strain by 30% with a length difference of 1.50cm at 16 weeks. The breast of Belgy strain was wider ($p<0.01$) than that of Pearl guinea fowls by almost 12.75% of breast width at 2 weeks which is shown as 4.51±0.04cm for Belgy and 4.00±0.04cm for Pearl. The breast of Belgy strain was wider ($p<0.01$) than that of Pearl strain by 13% with a length difference of 1.28cm at 16 weeks. The result is in line with the report of Assan (2013) that age is a major determinant of growth and physiological development. Fajemilehin (2010) reported significant difference in the growth performance of different strains of guinea fowl. The result of body weight and body linear measurements as affected by guinea fowl strains suggested that the Belgy strain was superior to Pearl when body weight and body linear measurements were considered from day old up to 16 weeks of age.

Conclusion and Recommendation

Belgy strain showed a greater potential for faster growth rate than Pearl strain. Belgy strain should be incorporated in improvement programme purposed for guinea fowl in Northern Guinea Savannah zone of Nigeria.

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