

COMPARATIVE MORPHOMETRICS TRAITS AMONG NOILER CHICKENS OF DIFFERENT PLUMAGE PATTERNS

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ABSTRACT

The study investigated morphometrics traits among noiler chickens of brown, barred, black, black and white, brown and white plumage patterns at 8 week. A total of 200 Day-old chicken of noiler breeds were obtained from Amo Farms Limited Oyo state. The chickens were distributed in duplicate of 25 chickens per plumage and fed with commercial diet (22% crude protein, 3000kcal/kgME). The research was carried at Adekunle Ajasin University. All routine management were practiced. The result obtained at the 8th week showed that the morphometrics traits for all the noiler chickens were all significantly different ($P < 0.05$) from each other with black and white plumage patterned chickens having the highest height (35.8333cm). The average weight gain indicated the least value in brown of 1055.55 ± 30.9204 g that was significantly different ($P < 0.05$) from brown and white with 1296.50 ± 73.9282 g. Wing length, breast width, breast length for all plumages were insignificantly different ($P > 0.05$). Black, black and white patterned noiler chicken was statistically insignificant, in beak length. The present study has revealed that the morphometrics traits of noiler chicken at 8th week, as influenced by difference in plumage patterns and could be used to make decisions in noiler chicken management and production.

Keywords: Noiler, plumage, morphometrics traits, weight gain

INTRODUCTION

Livestock in Nigeria are very important national resource, and contributes tremendously to the nation's wealth. Traditionally, animals are judged through visual examination, which is a subjective method of judgment (Abanikanda and Leigh, 2002). Therefore, the development of objective means (morphometric evaluation) for describing and evaluating body size and conformation characteristics would overcome many of the problems involved with visual assessment. In view of the importance of this small stock, it is important to initiate development programs that can genetically improve the birds for efficient and effective productivity. Morphometric evaluation of body traits (Oke *et al.*, 2004) provides useful information on the performance, productivity and carcass characteristics in animals.

Body measurements reflect primarily the length of the long bones of the animal and when taken over a period of time, they generally indicate the way in which the animal body is changing shape and it has been helpful for predicting of live weight and carcass characteristics (Oke *et al.*, 2004). In addition, correlations between body weight and linear body measurements are helpful not only in predicting body weight but also play a role in genetic improvement strategies such as breed characterization, evaluation of breed performance and prediction of live weight gain among other benefits. (Olawunmi, *et al.*, 2008). The most comprehensive measurement of growth available is still the bodyweights of live animals despite their being susceptible to short-term changes. Growth is a complex and highly dynamic physiological process that begins immediately after a zygote is formed and it continues until maturity. This paper evaluated morphometric trait of different plumage patterns of Noiler chickens, at week 8.

MATERIALS AND METHODS

Collection of material:

200 one-day old Noiler chicks was obtained from Amo Farm Sieberer Hatchery, Ibadan, Oyo State, Nigeria. One-day-old Noiler chicks of uniform plumage patterns were sorted and distributed randomly. Fresh and clean water was provided round the day. Routine and occasional poultry management practices was provided. The birds were fed ad-libitum without restrictions of light

intensity round the day, for the periods of the experiment. The diets were analyzed for their dry matter, crude protein and crude fiber composition (AOAC 1995). The study was carried out at Adekunle Ajasin University Akungba Akoko, Teaching and Research farm, of a mean annual rainfall of 1500-2000 mm and the average temperature ranging between 18°C and 35°C. Uniform plumage patterns were replicated, each of the plumage were housed in a wooden cage of 400cm by 300cm in a well-ventilated area. The morphological characteristics of the different plumage patterns which includes height, back length, wing length, breast width, breast length, shank circumference, beak length and weight gained were measured linearly, at 8 week, with a standard calibrated tape rule, through the under listed description.

Back length (cm): measurement was taken from the beginning of the neck to the tail; body height (cm): vertical measurements from the toes digit to the highest portion of the comb; wing length (cm): was determined by measuring from the beginning of the right wing to the tip of the wing. Beak length (cm): the length of the beak was denoted by measuring from the end of the nasal cavity to the tip of the beak. Breast width (cm): was determined by measuring the circumference of the fleshiest part of the breast. Breast length (cm): was measured from the cardiac to the basal region. Shank circumference (cm): The circumference of the right shank will be measured. Weight gain (g): birds was measured individually from each plumage patterns using scientific digital sensitive scale.

RESULTS AND DISCUSSION

Table 1: Relationship between the plumage patterns and various morphometric traits data at 8 week

Parameters	Height (cm)	Back Length (cm)	Wing Length (cm)	Breast Width (cm)
Plumage				
Black	35.4600±0.74185 ^a	29.3100±0.62991 ^a	20.0450±0.42149 ^a	13.2650±0.19819 ^a
Brown	32.3450±0.46120 ^b	27.5450±0.55462 ^a	20.2750±0.35562 ^a	13.5150±0.28620 ^a
Barred	34.1143±0.85008 ^{ab}	28.3381±0.34451 ^a	20.1476±0.29726 ^a	13.2190±0.20766 ^a
Brown (white)	31.4900±0.82791 ^b	28.4400±0.61756 ^a	20.5200±0.32173 ^a	13.0500±0.27497 ^a
Black (white)	35.8333±1.19490 ^a	29.1833±1.26027 ^a	19.5667±0.52196 ^a	13.3167±0.33308 ^a

Parameters (G)	Breast Length (cm)	Beak Length (cm)	Shank (cm)	Body weight
Plumage				
Black	13.3450±0.13367 ^a	2.04500±0.038713 ^a		4.26000±0.06087 ^{bc}
1242.25±51.8923 ^{ab}				
Brown	12.9300±0.29291 ^a	1.86000±0.031934 ^b		4.47500±0.08970 ^{ab}
1055.55±30.9204 ^c				
Barred	13.0524±0.16756 ^a	1.95714±0.031298 ^{ab}		4.15714±0.06955 ^c
1117.05±32.4598 ^{bc}				
Brown (white)	12.8300±0.32285 ^a	1.95000±0.87242 ^{ab}		4.58000±0.8794 ^a
1147.40±49.8318 ^{ab}				
Black (white)	13.5500±0.28373 ^a	2.08333±0.054263 ^a		4.50000±0.15055 ^{ab}
1296.50±73.9282 ^a				

The Table 1 above showed the relationship between the plumage patterns and various morphometric traits data at 8 week. Black, black and white plumage, having the highest performance of a close range was significantly ($p < 0.005$) different in height with respect to brown and (brown and white), barred also shows an insignificant ($p > 0.005$) difference to brown and (brown and white). The back length at 8 weeks of the research, of the various plumage under this studies show no significant difference at ($p > 0.05$), same observation was also noticed from the result table for the wing length, breast width, breast length at ($P \leq 0.05$). The beak length for brown and white, black, brown plumage are as well insignificant to barred and (brown and white). The shank circumference that was measured in centimeters for all the studied plumage patterns, it was established that (brown and white) plumage

birds was significantly different from barred and black plumage but insignificantly ($p>0.005$) different from (black and white) and brown plumage, but there was a close range value which were insignificantly ($p>0.005$) different between brown, (brown and white) and (black and white).

Weight gain was also determined among the plumage. The weight gained of (black and white) of about 1296g at 8 weeks was significantly higher as compared with brown and barred, in contrast, there was no significant difference between black, barred and (brown and white), but significantly higher to brown plumage at ($P\leq 0.05$).

DISCUSSION

From the result table, there was a progressive increase in the morphometric data collected as the age of the birds increase. In contrast to Shahjahan (2011), who considered six plumage, reported that there was no significant differences among the plumage with respect to weight gain as they increased in age at ($P> 0.05$), obtained height values for black and white birds was significantly ($P<0.05$) different from those of brown plumage but similar to those of to black, barred, brown and white ($p>0.05$). Ensminge (1992) documented that plumage pattern had genetic and breeding functions to play other than camouflage and defense mechanism, influencing the morphometric trait differences. From the obtained results, black plumage had potential for higher tendency for an increased height above other plumage patterns. The results obtained from this research shows no significant difference among the various plumage patterns for their back length, wing length, breast length in contrast to Al-Qamashoui *et al.*, (2014), although he compared the significant level among male and female gender of local chickens. Adamu *et al.*, (2021) corroborated our findings that there is no significant difference in the thigh length, shank length and wing length of Noiler chicken, meanwhile the current research shows a contrary fact that there was a significant difference in the shank circumference, but was in line with Okpeku *et al.*, (2004). The differences in the shank circumference, weight gain and beak length can't but attributed to the genetic makeup behind the plumage patterns variance of Noiler chicken.

CONCLUSION

The present investigation revealed the significances in the morphometric characteristics among five plumage patterns of Noiler chickens. Black, black and white showed superior value over other plumage in their height. Furthermore, there were insignificant differences in breast length, breast width, and wing length at 8 weeks of Noiler production. Therefore, Noiler birds with black or black and white had higher weight gain, beak length and height. Black plumage birds has potential to gain more weight in short while over other plumage patterns.

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