COMPARATIVE GROWTH PERFORMANCE AMONG NOILER CHICKENS OF DIFFERENT PLUMAGE PATTERNS AT STARTER PHASE

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ABSTRACT

The study investigated comparative growth performance among noiler chickens of brown, barred, black and multi plumage patterns at the starter phase. A total of 200 day-old chicks of noiler breeds were obtained from Amo Farms Limited. The chickens were distributed in duplicate of 25 chickens per plumage and fed with commercial diet (22% crude protein, 3000kcal/kgME). Data on average feed consumption, average weight gain, feed conversion ratio and feed efficiency were recorded weekly. The result obtained at the 4th week showed that the average feed consumption for all the noiler chickens were all significantly different (P<0.05) from each other with the multi plumage patterned chickens having the highest of 406.55g. The average weight gain indicated the least value of 385.57±5.9g that was not significantly different (P>0.05) from brown (402.73±17.4g) and multi plumage (432.00g). Both the feed conversion ratio and feed efficiency for brown, barred and black were all significantly different (P<0.05) in comparison to multi plumage patterned chickens. The black patterned noiler chicken showed the highest average weight gain. The present study has revealed that the performance of noiler chicken at the starter phase was influenced by difference in plumage patterns and could be used to make decisions in noiler chicken management and production.

Keywords: Noiler, plumage, feed consumption, weight gain

INTRODUCTION

Plumage patterns in avian species have been reported for different purposes such as camouflage against predators, sexual selection, social cues (Mason and Bowie, 2020); productive performance (Adetunji and Ola, 2020). It is controlled by both qualitative and quantitative traits (Klungland and Vage, 2000; Park *et al.,* 2013); and may occur at multiple scales being coordinated and localized patterns of within-feather colour variation (Mason and Bowie, 2020). It is an important factor in the development of particular lines in breeding programs.

Noiler chicken is an improved breed of poultry in Nigeria with varieties of plumage such as barred, white, brown, black etc. It is a dual purpose chicken that is for both meat and egg (Bamidele *et al.,* 2019; Suleiman *et al.,* 2019). It is developed by Amo farm Sieberer Hatchery Limited, along Ife-Odan Road, Awe, Oyo State. Noiler chicken was developed to support food security by improving household income due to their being very profitable. However, fewer studies exist on noiler chicken. Therefore, the objective of this study was to compare the growth performance among noiler chickens of different plumage patterns at starter phase.

MATERIALS AND METHODS

Samples and Location: 200 day-old chicken of noiler breeds were obtained from Amo Farms Sieberer Hatchery Ltd., along Ife-Odan Road, Awe, Oyo State. The birds were brood at the poultry unit of the Teaching and Research Farm, of the Adekunle Ajasin University, Akungba-Akoko**,** (T and R Farm, AAUA) Ondo State, Nigeria. 25 noiler chickens each of brown, barred, black and multi plumage varieties were duplicated and were raised to 4 weeks old. They were fed with feed containing 3000 kcal/kg of energy and 22% Crude protein (CP).

Experimental Design: Data such as average feed consumption and average weight gain of the noiler chickens based on their plumage pattern of brown, barred, black and multi were taken on weekly bases till end of the experiment. Data such as feed conversion ratio (FCR) and Feed Efficiency (FE) were then calculated. The data obtained were subjected to statistical analysis using the General Linear Models (GLM) procedure of software SAS, 2002 (SAS Institute, 2002).

RESULTS AND DISCUSSION

Tables 1 – 4 show the effect of plumage varieties on the growth performance of noiler chickens. At week 1 all the noiler chickens of different plumage varieties were significantly different (P<0.05) from each other based on their average feed consumption (AFC), average weight gain (AWG), feed conversion ratio (FCR) and feed efficiency (FE). At week 2, the multi patterned noiler chickens were significantly different (P<0.05) from the rest with highest AFC (292.5±0.00g) and FCR (1.65); the AWG showed no significant differences (P>0.05) among the chickens while the black patterned chickens had the highest FE (0.94±0.03) (P<0.05). At week 3, AFC for the noiler chickens with black plumage pattern was not significantly different (P>0.05) (296.32±2.99g) from multi colour plumage pattern (345.75g), barred (269.01±0.43) and brown (259.79±33.98g); while for AWG the brown (272.16±8.07g) and barred (270.9±3.76g) were not significantly different (P>0.05) and likewise (P>0.05) for black (298.69±8.48g) and multi (317.75g) patterned chickens. Both the FCR and FE were not significantly different (P>0.05) in all the chickens. At the 4th week, for AFC all the noiler chickens were all significantly different (P<0.05) from each with the multi colour plumage pattern having the highest of 406.55g. The AWG indicated the least value of 385.57±5.9g that was not significantly different (P>0.05) from brown (402.73±17.4g) and multi (432.00g). Both the FCR and FE for brown, barred and black were all significantly different (P<0.05) in comparison to multi colour plumage pattern.

Table 1: Effect of plumage varieties on the growth performance of noiler chickens at week 1

Parameters	Brown	Barred	Black	Multi
Average feed consumption (g)	87.15±0.00^{c}	86.33±0.00^{d}	92.50±0.00^{b}	135±0.00^{a}
Average weight gain (g)	74.27±0.00^{d}	77.61±0.00^{c}	79.08±0.00^{b}	81.25±0.00^{a}
Feed conversion ratio	1.17±0.00^{b}	1.11±0.00^{d}	1.17±0.00^{c}	1.66±0.00^{a}
Feed efficiency	0.85±0.0^{c}	0.89±0.00^{a}	0.86±0.00^{b}	0.60±0.00^{d}

^{abcd}Means within a row with different superscripts are significantly different (P<0.05). General Linear Model procedure (SAS®, 2002).

Table 2: Effect of plumage varieties on the growth performance of noiler chickens at week 2

Parameters	Brown	Barred	Black	Multi
Average feed consumption (g)	204.2±3.04^{b}	193.85±2.45^{c}	187.2±0.7^{c}	292.5±0.00^{a}
Average weight gain (g)	170.78±2.25^{a}	168.05±1.25^{a}	175.82±5.34^{a}	177.5±0.00^{a}
Feed conversion ratio	1.20±0.034^{b}	1.15±0.02^{bc}	1.0655±0.04^{c}	1.65±0.00^{a}
Feed efficiency	0.84±0.24^{b}	0.87±0.02^{ab}	0.94±0.03^{a}	0.607±0.00^{c}

^{abcd}Means within a row with different superscripts are significantly different (P<0.05). General Linear Model procedure (SAS®, 2002).

Table 3: Effect of plumage varieties on the growth performance of noiler chickens at week 3

Parameters	Brown	Barred	Black	Multi
Average feed consumption (g)	259.79±33.98^{b}	269.01±0.43^{b}	296.32±2.99^{ab}	345.75±0.00^{a}
Average weight gain (g)	272.16±8.07^{b}	270.9±3.76^{b}	298.69±8.48^{a}	317.75±0.00^{a}
Feed conversion ratio	1.06±0.05^{a}	0.993±0.02^{a}	0.99±0.038^{a}	1.09±0.00^{a}
Feed efficiency	0.95±0.05^{a}	1.0070±0.02^{a}	1.01±0.0385^{a}	0.92±0.00^{a}

^{abcd}Means within a row with different superscripts are significantly different (P<0.05). General Linear Model procedure (SAS®, 2002).

In this study, at week 4 of the starter phase, the black patterned noiler chicken showed, though in figure, the highest AWG compared to the rest. It clearly showed that the plumage patterns are governed by both qualitative and quantitative traits (Klungland and Vage, 2000; Park *et al.,* 2013). The effect of plumage colour on the AWG is in line that black plumage poultry has better performance with the data obtained by Dahloum *et al.* (2018) that Algerian indigenous naked-neck chickens of black feathered layers produced the biggest eggs in comparison to the white and brown-feathered layers of the same species. Adetunji and Ola (2020) also reported the black-feathered noiler hen produced overall average egg weight and egg weight at 52nd week of age (though not statistically

significant) in comparison to the brown noiler hens. Olaniyi (2023) also reported that black plumage noiler chicken has better growth performance to brown plumage noiler chicken at finisher's phase.

Table 4: Effect of plumage varieties on the growth performance of noiler chickens at week 4

Parameters	Brown	Barred	Black	Multi
Average feed consumption	280.88±3.17^{b}	255.98±5.84^{c}	288.50±4.97^{b}	406.55±0.00^{a}
Average weight gain	402.73±17.4^{ab}	385.57±5.9^{b}	436.27±16.6^{a}	432.00±0.00^{ab}
Feed conversion ratio	0.70±0.038^{b}	0.66±0.05^{b}	0.66±0.37^{b}	0.94±0.00^{a}
Feed efficiency	1.44±0.08^{a}	1.51±0.01^{a}	1.51±0.08^{a}	1.06±0.00^{b}

^{abcd}Means within a row with different superscripts are significantly different (P<0.05). General Linear Model procedure (SAS®, 2002).

CONCLUSION

The present study has revealed that the performance of noiler chicken at the starter phase was influenced by difference in plumage patterns. The noiler chicken with black plumage may be considered for meat production based on growth performance. However, further studies are recommended to investigate the underlying mechanisms behind these differences for better performance.

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