EFFECT OF OUTDOOR AND PASTURE FORAGING ACCESSIBILITY ON PERFORMANCE RESPONSES OF NOILER BIRDS

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ABSTRACT
This experiment was carried out to determine the effect of outdoor and pasture foraging accessibility on performance responses of Noiler birds. A total number of 320 Noiler birds were divided into 5 treatments and each treatment were replicated 4 times with 16 birds per replicate. At the end of the brooding phase (2 weeks), the birds were placed in a 2 x 2 factorial arrangement (were outdoor durations and pasture accessibility was considered as factors) in a completely randomized designed (CRD).Were T1 serves as control (Indoor), T2 4 hours outdoor accessibility, 8 hours outdoor, 4 hours outdoor plus pasture foraging and 8 hours outdoor plus pasture foraging for T2, T3, T4 and T5 respectively. The data obtained in this study were subjected to Analysis of Variance (ANOVA) were means were separated using Duncan multiple range test (DMRT) of the statistical analysis software package (SAS). The birds in T2 had significantly ($P<0.05$) higher final weight, similarly, higher ($P<0.05$) weight gain were observed in birds reared in T2. The result however, suggest non-significant ($P>0.05$) differences in initial weight, feed conversion ratio, feed cost per kilogram diet. It is therefore concluded that outdoor and pasture foraging has a profound effect on performance profile of Noiler birds. It is therefore recommended for better final body weight and weight gain birds should enriched birds with pasture foraging material and at least 4 hours outdoor accessibility.

Key words: Outdoor, Foraging, Performance and Noiler

INTRODUCTION
There is growing demand for poultry meat worldwide, particularly in developing countries partly in response to population growth and growing affluence (Elkashaf *et al.,* 2016). In response, poultry industries have intensified, adopting high stocking densities and rapid growth genetics to maximise output and profitability. Crowded living space can have a significant positive impact on farmer incomes, which generally increase with stocking density (Bessei, 2018). However, decrease in space allowance is likely to have detrimental effects on the welfare of the birds (Bessei 2006; Meluzzi and Sirri, 2009). Free range and organic poultry production systems were developed following a growing awareness of human health and nutritional concerns (Fanatico *et al.,* 2007). Consumers ascribed greater quality and security of meat and high standards of animal welfare to specialty products obtained from such alternative systems, although there is little scientific evidence supporting these perceptions (Ponte *et al.,* 2008). There is a growing body of literature that recognises the importance of allowing chickens to express their natural behaviour by providing outdoor access. However, studies investigating the effects of offered outdoor access to housed meat chickens in the tropics are scarce (Sanchez-Casanova *et al.,* 2019)

The demand for better tasting meat, improved animal welfare, and environmental friendly production has led to the modification of production systems practiced in Europe and the United States (Comert *et al.,* 2016).

In Nigeria, it is observed that the practice of animal ethics is lacking or non-existent. Animal ethics and welfare issues are hardly taught in schools and rarely table for discussion at scientific conferences and workshops. The reasons for this fragrant neglect are not known. Poultry farmers may be absolved of blame since they are generally ignorant of animal management and welfare issues (Babeyemi and Bamikola, 2010). However, the concern of the populace towards animal ethical practices is a fast growing field in some developed countries in the world especially in the United State. This may be due to its positive effects on the animal, their products and by-products for the use of man (Akinyemi *et al.,* 2011).

Commercial broiler chicken welfare is receiving increasing scrutiny from the media and non-governmental organizations concerning welfare issues associated with rapid growth and rearing conditions. Currently, in Nigeria there is little scientific information regarding the effect of outdoor access on the performance of both fast-growing and slow growing meat producing birds. The free-range production system which is one of such systems has been observed to increase the flavour of chicken compared with conventionally confined systems with high density (Tong *et al.*, 2014). Poultry products derived from free range or organic production are very popular sources of food with consumers' preferring these poultry products because they believe that the products have a superior sensory quality and meat security coupled with high standards of animal welfare (Tong *et al.*, 2014).

MATERIALS AND METHODS

Experimental site

The experiment was conducted at Poultry unit of Livestock and Teaching and Research Farm, Department of Animal Science, Federal University Dutsin-Ma, Katsina State, Nigeria. Dutsin-Ma LGA lies on latitude 12°26'N and longitude 07°29'E. Rainfall is between May and September with a peak in August. The average annual rainfall is about 700 mm. The mean annual temperature ranges from 29°C – 31°C. The highest air temperature normally occurs in April/May and the lowest in December through February (Abaje *et al.*, 2014).

Experimental birds and design

A total 320-day-old chick Slow-growing (Noiler) meat type birds was procured from a reputable hatchery. The birds were brooded in an indoor floor pen.

At the end of the brooding phase (2 weeks), the birds were placed in a 2 x 2 factorial arrangement in a completely randomized design. The factors were housing on deep liter without outdoor or deep litter with outdoor access and pasture foraging) and 4- or 8-hours outdoor accessibility. Therefore, there were five treatments as shown below:

6. Treatment one – Noiler birds reared on deep litter without outdoor accessibility
7. Treatment two – Noiler birds reared on deep litter with 4 hours outdoor accessibility
8. Treatment three – Noiler birds reared on deep litter with 8 hours outdoor accessibility
9. Treatment four – Noiler birds reared on deep litter with 4 hours outdoor + Pasture foraging
10. Treatment five – Noiler birds reared on deep litter with 8 hours outdoor + Pasture foraging

Sixty-four (64) birds was assigned to each of the treatments above each treatment was have 4 replications of 16 birds each. The Deep Litter group was reared indoors on concrete floors without access to outdoors while the Deep Litter and Pasture Foraging group was have indoor pens that opened onto separate yards, which was be surrounded by net fencing. The indoor portion of each pen was having 1 fount-type or bowl drinker and a hanging conical feeder and pasture for foraging groups. The outdoor portion of each DLFR pen were 2 x 20m^2 (4m2 per bird) have 1 drinker and a feeder with a rain shield.

Growth Performance

For feed intake and live weight gain: A given quantity of feed was measured and fed to the birds on a weekly basis. From which weekly feed intake was measured. Daily feed intake and total feed intake was determined. The birds were weighed at two weeks as they are assigned to the various treatments. From thereon, they were weighed early in the morning before receiving any feed and water using a weighing balance at weeks' interval during the experimental period. Initial and final body weights of the birds were measured at the beginning and end of the experiment respectively. Average daily weight gain and feed conversion ratio was determined.

RESULT AND DISCUSSION

The result on growth performance of slow growing meat birds raised with outdoor accessibility and foraging were presented in table 1 below. The result revealed that there are non-significant ($P>0.05$) difference in initial weight of the birds in this study that mean the birds were all homogenous in terms of body weight before the commencement of this study while the final weight of indicate significant ($P<0.05$) differences with increases of outdoor accessibility and pasture foraging of birds in this study. Birds raised in T2 had the highest final body weight (1.717) followed by 1.703, 1.647, 1.640 and 1.623 for T3, T4, T1 and T5 respectively. Similarly, there are significant ($P<0.05$) difference in

weight gain of the Noiler birds with access to outdoor and pasture foraging practices. 1.012% in T2 was the highest weight gain obtained in this study while 0.902 in T5 was the lowest weight gain values obtained in a bird raised with outdoor accessibility and pasture foraging.

The result in study indicate that total feed intake, feed conversion ratio and feed conversion per kilogram live weight gain were not statistically (P>0.05) different in among the slow growing birds raised in this study despite numerical differences exist between treatment mean. The result further revealed that there are no significant (P>0.05) difference in feed cost per kilogram gain.

The increase in growth rate for those in outdoor accessibility may be linked to increase in welfare and sunlight accessibility compared to confinement group. This will however, support the study conducted by Cao *et al.* (2008) that suggested that increased growth of male birds under different light wavelength has attributed to increased levels of testosterone and growth hormone production, which in turn stimulates the myofiber growth of the pectoral muscles.

Table 1: Effect of outdoor accessibility and pasture foraging on Noiler bird's performance

Parameters	T1	T2	T3	T4	T5	SEM
Initial body weight (kg)	0.735^{a}	0.705^{a}	0.717^{a}	0.732^{a}	0.721^{a}	0.013
Final body weight (kg)	1.640^{bc}	1.717^{a}	1.703^{ab}	1.647^{bc}	1.623^{c}	0.026
Weight gain (kg)	0.905^{b}	1.012^{a}	0.987^{ab}	0.915^{b}	0.902^{b}	0.026
Total feed intake	4.419^{a}	4.562^{a}	4.474^{a}	4.463^{a}	4.351^{a}	0.089
FCR	4.889^{a}	4.507^{a}	4.545^{a}	4.545^{a}	4.831^{a}	0.123
FC/Kg Feed (₦)	1095.20^{a}	1009.56^{a}	1018.00^{a}	1082.15^{a}	1082.08^{a}	27.600

FCR= Feed conversion ratio, FC/KG= Feed cost per kilogram feed, SEM= Standard error mean

CONCLUSION

It could be concluded that outdoor and pasture foraging has a profound effect on performance profile of Noiler birds. It is therefore recommended for better final body weight and weight gain birds should enriched birds with pasture foraging material and at least 4 hours outdoor accessibility.

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