PERFORMANCE AND CARCASS CHARACTERISTICS OF NOILER CHICKENS REARED UNDER DIFFERENT HOUSING TYPE.

Suleiman Aliyu[1], Zainab Saminu Jibia[1], and Mustapha Nalado Sabo[1].

[1]Department of Animal Science, Faculty of Agriculture, Federal University, Dutsin-Ma, Katsina State, Nigeria.

**Corresponding Author Email: smartclassfudutsinma@gmail.com Tel: +234-8034536681*

ABSTRACT

The study was conducted at Livestock Teaching and Research Farm, Department of Animal Science, Federal University Dutsin-Ma Katsina State. The aim of this study was to determine the Performance and welfare parameters of Noiler birds reared under two different housing types with or without pasture. Noiler is an improved indigenous dual-purpose breed of chicken developed in Nigeria to meet national demands for food supply. From the result obtained, the weight gain was increased while FCR was reduced by given Noiler access with pasture. The recent increase in free-range meat production and consumption has led to extensive investigation in this area, especially, with regards to Nigerian indigenous breed. Pasture consumption results in dilution of energy and protein intake and may cause impaction and dietary electrolyte imbalances. One hundred and twenty (120) chickens were brooded for 4 weeks and thereafter allotted to three (3) treatment for a period of 12 weeks. Each treatment was allotted 60 chicks (20 chicks per replicate) with three replicates of 20 chicks. On the 84th day, a total of 36 birds were randomly selected for slaughtering to obtain the carcass yield, giblet and offal analysis were determined. The O-P/outdoor with barren land shows a significant difference in terms of final body weight, weight gained and total feed intake (1.71%, 0.99% & 4.52%). The result shows that, there is significant differences between O-P to DL and O+P. Meanwhile, DL and O+P recorded highest scores of FCR and FC (4.89%, 4.86% & 1095.20%, 1087.62%) respectively.

Keywords: Noiler chicken, *Lablab,* free range, carcass, *ad libitum*

INTRODUCTION

In recent years, the increased emphasis on regulation has driven changes on how animals are fed and managed and will continue, possibly in an accelerated manner with much pressure on considered an environmentally sound and economically viable approach Olaniyi, *et al.,* (2012). The environments to which poultry birds are exposed include the housing system, the feed they consume, climatic factors and management systems which affect the performance of the birds Abeke *et al.,* (1998). Furthermore, the outdoor production system increases the flavor of chicken better than the conventionally confined systems (Fanatico *et al.,* 2006, Latter 2000 & Lewis *et al.,* 1997). However, little is known about whether accessing an outdoor range affects the welfare of chickens.

In low-input systems, housing and management aim for optimizing health and welfare of chickens, for example, by setting limits on flock size and stocking densities Erian and Phillips (2017). The outdoor range provided in commercial poultry farms is usually exposed to highly variable environmental conditions (i.e., sun, rain, snow, wind, storms), as compared to climate-controlled indoor housing (Richards *et al.,* 2011, Gordon and Charles, 2002), provides no or little shelter, and may pose increased risk of predation Bestman and Bikker Ouwejan, (2020).

MATERIAL AND METHODS

The experiment was conducted in the Livestock Teaching and Research Farm, Federal University Dutsin-Ma, Katsina State. A total of 120 day-old Noiler chicks was obtained from a reputable commercial hatchery company and the chickens was reared for 4 weeks indoors (brooding). At the end of the fourth week, the birds were moved to the experimental pens. The birds were placed randomly in each of the following three (3) treatments and three (3) replications in completely randomized design. The assigned treatments allocated are Deep Litter (DL), Outdoor without Access to Pasture (O-P) and Outdoor with Access to Pasture (O + P) respectively. The birds on outdoor pecked on pasture legume (*Lablab purpureus L.*) commonly known as Hyacinth bean which the birds pecked on daily basis. Each bird with pasture have direct access to Hyacinth bean *ad libitum* and commercially (experimental diet) prepared diet while those on outdoor without pasture have no access to *Lablab* for 12 weeks of the experiment (that is, O-P and O+P). However, birds managed in deep-litter/indoor (DL) were given feed of the same nutrient/ commercially (experimental diet) prepared diet and water *ad libitum*.

The performance of the Noiler chickens reared in the production systems (deep litter, free range and pasture) were regressed against the weeks of production Santos *et al.,* (2005). The body weight gain and carcass of the birds were taken and analyzed. All the data from the experiments was analyzed using Analysis of Variance (ANOVA) in Systat software Santos *et al.,* (2005). Significantly ($P<0.05$) different means was separated using Duncan's Multiple Range Test (DMRT) as contained in SAS (1999) package.

RESULT AND DISCUSSION

PERFORMANCE CHARACTERISTICS

Table 3.1: Growth Performance of Noiler chickens Reared under Free Range

Parameters	DL	O-P	O+P	SEM
Initial Body Weight (kg/bird)	0.74	0.71	0.73	0.01
Final Body Weight (kg/bird)	1.64^{b}	1.71^{a}	1.64^{b}	0.01
Weight Gain (kg)	0.91^{b}	0.99^{a}	0.91^{b}	0.02
Total Feed Intake (kg)	4.42	4.52	4.41	0.06
Feed Conversion Ratio	4.89^{a}	4.53^{b}	4.86^{a}	0.08
Feed Cost/kg weight gain	1095.20^{a}	1013.78^{b}	1087.62^{a}	17.93

$^{a-b}$ means within rows bearing different superscripts differs significantly at $p > 0.05$.

DL = Deep Litter, O+P = Outdoor with Pasture, O-P = Outdoor without Pasture and SEM = Standard Error of Mean

The result of growth performance of birds is shown in TABLE 3.1. Initial body weight was similar ($P>0.05$) among all the treatments. Highest final body weight and body weight gain were obtained in O-P (1.71kg and 0.99kg respectively) which were significantly higher than those of DL and O+P. There is no significant difference ($P>0.05$) between DL and O+P (*Lablab purpureus*) in terms of final body weight and body weight gain (DL: 1.64 & O+P: 1.64). In contrast to the findings in the current study, (Jiang, *et al.*, 2011 and Chen *et al.*, 2013) indicated that there were no significant differences in the performance of chickens with outdoor access. Some studies indicated that outdoor access (more frequent and further away from the shed) caused a reduction in body weight of broilers (Po1towicz and Doktor 2011; and Taylor *et al.,* 2020).

This is in agreement with observations of Castellini *et al.,* (2002), who reported that outdoor treatments reduced growth rate compared to the conventional housing. This finding is also contrary to the results of

(Ponte *et al.,* 2008) who reported that outdoor raised birds with access to pasture had higher body weights when compared with birds without access to pastures. Additionally, Santos *et al.,* (2005) reported that birds in semi-confined environment had better body weight gains due to better comfort and welfare (Oke *et al.,* 2016) also reported that access to legume pasture improved the performance of hens. (Ponte *et al.,* 2008) showed significantly higher body weight in broiler chickens that had free access to pasture.

There are no significant differences in terms of total feed intake (TFI) among all the treatments.
(Knight *et al.,* 2018) Reported that, the finding would assume that intake would be slightly higher on a legume based pasture, but would most likely make no significant difference. This assertion is in consonance with (Oyegunle *et al.,* 2021) reported that, often times, farmers assume that poultry raised on pasture will consume less feed over their production cycle when compared with house raised poultry due to foraging for grass and insects. However, this is not true. Animals will have a higher energy demand living outside because they are expending more energy walking around and using more energy to stay warm/cool. O-P has the lower feed conversion ratio (FCR) and feed cost (FC) (FCR 4.53 & FC 1013.78~~₦~~), while DL and O+P has higher FCR and FC (FCR 4.89, 4.86 & FC 1095.20~~₦,~~ & 1087.62) respectively. The result of this study shows that there is no significant ($P > 0.05$) differences both in FCR and FC between DL and O+P. In contrary, (Oke, *et al.,* 2015) who reported that the feed conversion ratio was better on the pastures than in the deep litter system, but this did not translate into higher body weight but possibly being used for other activities.

Carcass characteristics of Noiler

Table 3.2 Carcass Analysis/g/kg

Parameters	DL	O-P	O+P	SEM
Live Weight (kg)	1.90	1.83	1.74	0.14
Dress Weight (%)	59.89	68.85	65.88	2.83
Breast Weight (%)	16.51	18.20	17.18	2.04
Wing Weight (%)	9.22	9.84	8.92	1.32
Back Weight (%)	13.69	13.58	13.26	1.91
Neck Weight (%)	6.55	5.92	5.80	1.09
Thigh Weight (%)	18.93	20.61	19.77	2.60
Legs Weight (%)	3.04	4.27	3.96	0.51

[a-b] means within rows bearing different superscripts differs significantly at $p < 0.05$.
DL = Deep Litter, O+P = Outdoor with Pasture, O-P = Outdoor without Pasture and SEM = Standard Error of Mean.

Mean yields of eviscerated carcass, live, dress, back, breast, neck, thigh, wing, and leg of chickens in 2 raising systems (DL/O+P) are shown in table 2. The result obtained shows that there is no significant differences among all the treatments in terms of live, dress, back, breast, neck, thigh, wing, and leg. Meaning that, all the treatments are statistically the same. In the present study, although stocking density was lower in the free-range treatment, there was no effect of the production system on eviscerated carcass, breast, thigh, and wing yield ($P > 0.05$), which was in consistent with (Sogunle *et al.,* 2012). In contrast, [30] and [2] found that percentages of breast and thigh meat increased when birds had an outdoor access and a lower stocking density in an organic production system because of forced motor activity.

CONCLUSION

In conclusion, from this result obtained, the weight gain was increased while FCR was reduced by given Noiler access with pasture. There was no effect of the production system on carcass and eviscerated analysis of breast, thigh, and wing, gizzard, liver, heart and intestinal yield of Noiler chickens reared under different housing type ($P > 0.05$).

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