COMPARATIVE PERFORMANCE OF TWO STRAINS OF LAYER CHICKS FED HONEY AS REPLACEMENT OF ANTIBIOTICS

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ABSTRACT
The present study examined the comparative performance between two strains of layer chick reared in the semi-arid region and fed honey in place of antibiotics. Two egg layer strains, made up of one brown (Lohman Brown classic), one black (Nera Black) were sourced from reputable hatchery. Eighty eight day old chicks from each of the strains were in a 2 x 2 factorial arrangement in a completely randomized design with the two strains (Lohmann brown classic and Nera black) and administration of honey (with and without) as the factors. These made up four treatments which were replicated thrice with 22 chicks per replicate. Feed intake and body weight were measured and weight gain and feed conversion ratio were determined. The results of the study showed that performance parameters of two strains measured were statistically similar except for Mortality. Nera black strain had a higher mortality. The total feed cost of the brown strain was higher having ₦240.768 as compared with Lohmann Brown strain having ₦220.096. Even though there are no significant differences between the treatments in feed cost per kg gain, numerically brown strain had higher feed cost per kg gain (₦455.240) than Black strain (₦450.371) birds. Feeding honey as replacement for antibiotics did not affect (P>0.05) final weight, weight gain, total feed intake FCR and total water intake. Mortality is slightly higher (P<0.05) for layer strain chicks that are not fed water with honey then those fed water with honey.
Keywords: Strain, semi-arid, honey, performance, chicks

INTRODUCTION
The egg industry is enjoying increased production as consumers become more educated about the nutritive value of eggs and as more eggs are processed (Leeson and summers, 2005). Eggs are relatively inexpensive per unit of protein and energy contained in yolk and albumen, and so egg consumption continues to increase in developing countries (Leeson and summers, 2005). Most of the major international poultry breeders are located in temperate countries while much of the world's poultry production takes place under more extreme temperature conditions in the tropical regions. Often humid conditions are very extreme, in addition to the prolonged periods when the temperature is over 30°C (Gowe and Fair full 2008).

The availability and affordability of eggs and poultry meat will go a long way to meet the protein needs of several populations in hot regions. An obvious constraint on poultry production in these regions is the climate. It is certain that the genetic potential of poultry is greatly affected by the environment. It is in response to some of these questions that this study will be conducted to evaluate comparative performance of commercial layer strains reared in semi-arid tropics and fed honey as replacement for Antibiotics.

MATERIALS AND METHODS
The study was conducted at the Poultry Unit, Livestock Teaching and Research Farm, Department of Animal Science, Federal University Dutsin-Ma. Dutsin-Ma lies on latitude 12°26'N and longitude 07°29'E (Abaje *et al.*, 2014).

Two egg layer strains, made up of one brown (Lohman Brown classic), one black (Nera Black) were sourced from reputable hatchery. Eighty eight day old chicks from each of the strains were in a 2 x 2 factorial arrangement in a completely randomized design. The two strains (Lohmann brown classic and Nera black) and administration of honey (with and without) served as the factors giving four treatments and replicated thrice with 22 chicks per replicate.

The chicks were reared in floor pens covered with a thick layer of wood shavings. The birds were reared up to 8 weeks of age. Feed and water were supplied *ad libitum* during the whole period. They were fed diet having crude protein contents of 20.0% and energy contents of 2,800kcal/kg (NRC, 1994; Leeson and Summers, 2005). A given quantity of feed was measured and fed to the birds on a weekly basis. From which weekly feed intake was measured. The birds were weighed in the early

morning before receiving any feed and water using a weighing balance at two 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 were determined. Water intake was also determined. Mortality was recorded. Data from all experiments were analyzed using the general linear models (GLM) procedure of SAS software (SAS Institute Inc., 1994) according to a completely randomized design. Data were subjected to analysis of variance. Where the analysis of variance is significant, Duncan's multiple range test was used to separate the treatment means (Steel and Torrie, 1980).

RESULT AND DISCUSSION

The growth performance of chicks of two strains of commercial layer chicken is shown in Table 1. All the performance parameters of two strains measured in this study were statistically similar except for Mortality. Contrary to this Olawumi and Dudusola (2012) and Yakubu *et.al* (2007) reported that Nera black genotypes are more feed efficient and converted feed given to produce more egg than Lohman brown strain under the same condition. The only explanation for these differences may be attributed to genotype variability.

Table 1: Performance of Chicks of two Strains of Commercial Layer Chickens in Semi-Arid Region (0-10 weeks)

Parameter	Brown strain	Black strain	SEM
Initial weight (kg/bird)	0.036	0.032	0.001
Final weight (kg/bird)	0.529	0.569	0.021
Total weight gain (kg/bird)	0.493	0.537	0.021
Total feed Intake (kg/bird)	1.448	1.584	0.014
Feed conversion ratio	2.955	2.963	0.130
Total feed cost (₦/bird)	220.096	240.768	5.600
Feed cost/kg gain (₦)	455.240	450.376	7.002
Mortality	2.750[b]	4.250[a]	0.382

a, b, c, d, e, = Means within rows with different superscript are significantly different ($p<0.05$).

There was difference between the two layer strains in terms of total feed cost of the two layer strains. The total feed cost of the brown strain was higher having ₦240.768 as compared with Lohmann Brown strain having ₦220.096. The black strain has higher total feed cost than the brown strain because the Black strain had higher feed intake, which translates to the higher feed cost. Even though there are no significant differences between the treatments in feed cost per kg gain, numerically brown strain had higher feed cost per kg gain (₦455.240) than Black strain (450.371) birds. This is because black strain had higher FCR (2.963) than brown strain (2.955) but the lower the better FCR.

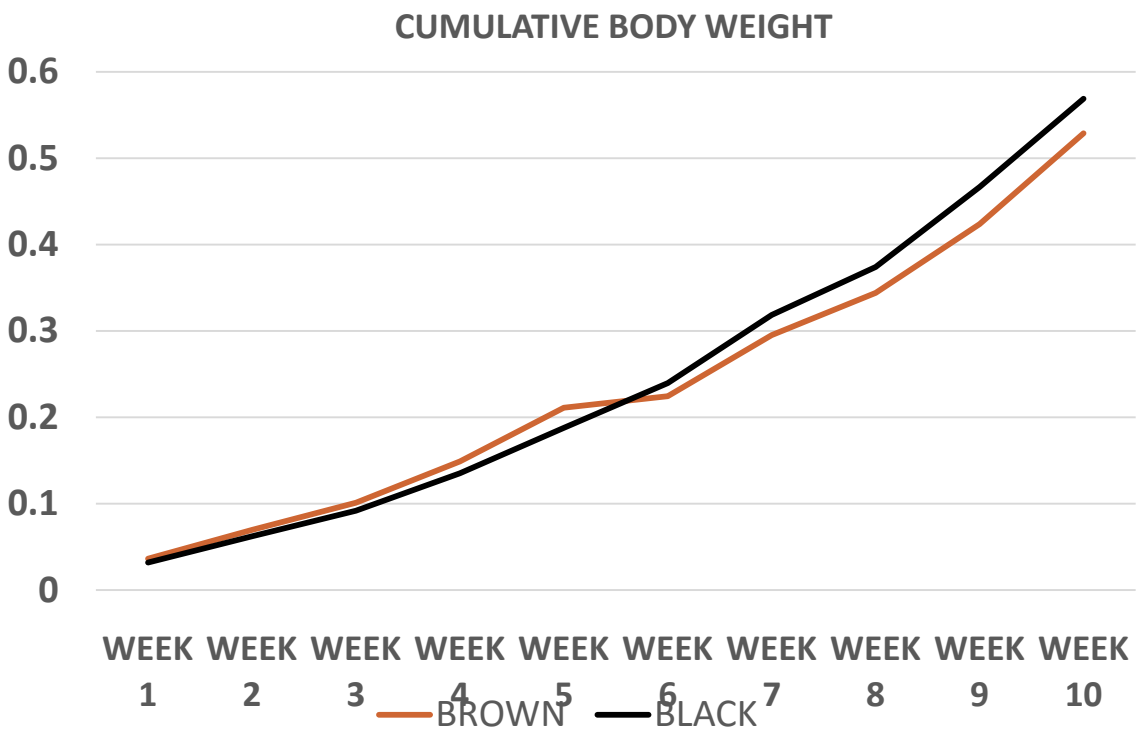

Fig. 1: Cumulative Weight Gain of Commercial Layer Strain Chicks Reared in Semi-Arid Tropics

The cumulative weight gain of commercial layer strain chicks reared in semi-arid tropics shown in figure 1. The body weight of the Brown strain is slightly higher than black strain at initial stage but decline at 6 weeks while Black strain continuously increasing.

Main effect of Strain of Commercial Layer Strains fed honey as replacement for antibiotics (7-10 weeks)

The initial weight, total feed intake and water intake were statistically different for the two strains of the layer chicks fed honey as replacement for antibiotics as shown in table 2. Total feed intake was higher ($P<0.05$) for the black strain (1.253kg/bird) compared to the brown strain (1.127kg/bird). The black strain also consumed more ($P<0.05$) water (290.800 ml/bird) than the brown strain (243.297 ml/bird). The final weight, weight gain, FCR and mortality were similar ($P>0.05$) for the two strains.

Table 2: Performance of Chicks of two Strains of Commercial Layer Chickens Fed Honey as Replacement for Antibiotics (7-10 weeks)

	Initial weight	Final weight	Weight gain	Total feed Intake	FCR	Total Water Intake	Mortality
Strain							
Brown	**0.295**	**0.529**	**0.234**	**1.127^{b}**	**4.964**	**243.297^{b}**	**1.000**
Black	**0.318**	**0.569**	**0.251**	**1.253^{a}**	**5.128**	**290.800^{a}**	**1.750**
SEM	**0.005**	**0.021**	**0.019**	**0.011**	**0.440**	**6.957**	**0.426**
Honey							
Water + honey	**0.317**	**0.534**	**0.217**	**1.172**	**5.502**	**267.090**	**0.750^{b}**
Water – Honey	**0.297**	**0.564**	**0.267**	**1.208**	**4.589**	**267.007**	**2.000^{a}**
SEM	**0.005**	**0.021**	**0.019**	**0.011**	**0.440**	**6.957**	**0.426**

a, b, c, d, e, = Means within rows with different superscript are significantly different ($p<0.05$).
FCR – Feed conversion ratio

Main effect of honey fed to Commercial Layer Strains as replacement for antibiotic (7-10 weeks)

The final weight, weight gain, total feed intake FCR and total water intake were similar (P>0.05) for layer strain chicks fed water with or without honey as replacement for antibiotics as shown in table 2. Mortality is slightly higher (P<0.05) for layer strain chicks that are not fed water with honey then those fed water with honey. This agrees with the observation of Babaei *et al.* (2016) who reported that feed intake was not affected when they fed honey to Japanese quails. Contrary to the results of this study Babaei *et al.* (2016) observed differences in the weight gain and FCR of Japanese quails fed honey.

Conclusion and Recommendation

From the result of the study, the two layer strains performed similarly in all measured parameters except for mortality which was higher for Nera black strain. Feeding honey in place of antibiotic reduced mortality of layer strain chicks. More researches should be conducted to further compare the performance of different layer strains chicks during laying phase and the mechanism of action of honey as replacement for antibiotics.

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