ABG -09

Effect of Mating Ratio on Weight of Day Old Chicks in Lines of Shikabrown@ Parent Stock Chickens

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Abstract
An experiment was conducted to evaluate the effect of mating ratio on weight of day old chicks in lines of Shikabrown @ parent stock chickens. A total of 210 birds (30 roosters and 180 hens) from the two lines were used for this study. Fifteen (15) roosters were mated to 90 hens in the dam and sire lines at mating ratio 1:3, 1:6 and 1:9, and a total of 1711 fertile eggs were hatched in three sets. Weight of day old chicks was taken using a weighing balance in grammes. Data collected were subjected to ANOVA procedure of SAS, with significant means separated by DMRT procedure. From the results obtained, no significant ($p<0.05$) difference was observed on the weight of day-old chicks in the two lines. In conclusion, it is recommended that lower mating ratio be used for chick production to reduce cost of production.

Keywords: Mating, weight, chickens, lines, ratio, parent

Introduction

The success of the sustenance of poultry production chain depends on regular and constant supply of day-old chicks; with commercial poultry operators relying on hatcheries for the supply of day-old chicks for production (Stromberg, 1975). Mating system, age of eggs, egg storage condition, flock age, husbandry and rearing practices, incubator temperature and relative humidity and egg turning are among the several factors affecting poultry egg hatchability (Brah and Sandhu, 1989; Tarongoy *et al*., 1990; Weis, 1991; Gebhardt-Henrick and Mark, 1991; Buhr, 1995 and Permsak, 1996). Reports have also shown poor egg storage, prolonged egg storage, breeder age, incubation problems, genetic effect of breeds, varieties and individuals within breeds as potential factors leading to poor egg fertility and hatchability (Fairchild *et al*., 2002; Islam *et al*., 2002).

Therefore, this research was carried out to evaluate the effect of mating ratio on weight of day-old chicks.

Materials and Methods

Experimental location: This study was conducted at the Breeding Unit of the Poultry Research Programme, National Animal Production Research Institute (NAPRI), Ahmadu Bello University, Shika-Zaria, Kaduna State-Nigeria. The Research station lies between $11^0$12'N and $7^0$33'E, at an altitude of 691 m above the sea level (Ovimaps, 2011).

Experimental birds and management: A total of 210 Shikabrown® parent stock chickens were used for this experiment, consisting of 30 roosters and 180 hens (52 weeks of age) from the dam and sire lines. Birds of the two lines were mated at ratio 1: 3, 1: 6 and 1: 9, with each group replicated five times. A total of 30 families were generated, 15 for the dam line and 15 for the sire line, with the roosters allowed to mate with the hens freely during the experimental period. The birds were kept under a deep litter management system, with the pens (3m x 1.5m) fitted with wood shavings. Drinkers, feeders and nest boxes were also provided. The birds were provided with recommended feed and medication, with water provided *ad libitum.*

Hatching traits: Fertile eggs from each pen were collected for a period of seven days post-mating. A total of 1711 eggs were collected, labeled accordingly and taken to the hatchery of the National Animal Production Research Institute (NAPRI) for storage, incubation and hatching. Three hatches were collected during the experimental period. A total of 20 chicks per mating ratio were sampled at random from the population of chicks hatched and their average body weight was obtained using a digital scale in grammes (g).

Statistical analysis: Data collected on weight of day old chicks were subjected to analysis of variance (ANOVA) using the General Linear Model (GLM) procedure of SAS (2004), with significant means separated using Duncan Multiple Range Test (DMRT). All data were analysed according to the following model:

$Y_{ijk} = \mu + B_i + T_j + H_k + e_{ijk}$

Where;

Y_{ijk} =observation of the i^{th} line (B), j^{th} mating ratio (T) and k^{th} hatch
μ = Overall mean,
B_i= effect of the i^{th} line,
T_j= effect of the j^{th} mating ratio
H_k= effect of the k^{th} hatch
e_{ijk} = Random error.

Results and Discussion

Results obtained showed significant ($p<0.05$) difference across hatches at mating ratio 1:3, 1:6 and 1:9 in both the dam and sire lines studied. Several incubator factors such as temperature, humidity and turning condition might have resulted to these differences as reported by Elibol and Brake (2003); Lourens *et al*. (2005). The findings of King'ori (2011) showed egg collection, handling, and egg storage condition as additional factors likely to result to these differences.

Table 4. 4: Least square means for day-old weight of chicks (g) at varying mating ratio in lines of Shikabrown@ parent stock.

Mating ratio	Dam line Means	Sire line Means	SEM	LOS
1: 3	31.75	32.83	2.74	Ns
1: 6	29.92	31.00	2.50	Ns
1: 9	29.83	30.25	3.24	Ns

LOS-level of significance, SEM-standard error of mean, ns- not significant ($p>0.05$).

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