



Inheritance of juvenile body weight at five weeks of age in a colored synthetic sire line broiler

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ABSTRACT

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The data utilized in the present study pertaining to 2752 progenies (1432 males and 1320 females) from 62 sires and 496 dam of colored synthetic sire line broilers maintained at AICRP on Poultry Improvement of Orissa University of Agriculture and Technology, Bhubaneswar located at College of Veterinary Science and Animal Husbandry, Bhubaneswar, Odisha. The mean±S.E. for body weight at day old, five week, breast angle, shank length and keel length all measured at five weeks of age, for males and females were presented. The heritability estimates for body weight at five weeks of age were high while for other traits the estimates were low to moderate increase in both the sexes. The genetic correlations of five week body weight with all other traits were positive and high in both the sexes except body weight at day old age. The phenotypic correlations for these traits were positive but low in magnitude. Results suggested that a selection index using body weight, breast angle, shank length and keel length at five weeks of age is expected to give better response for the sire line parents than selection for body weight alone.

Keywords: Conformation traits, Heritability, Correlation in broiler.

INTRODUCTION

Juvenile body weight is the single most important economic trait in broilers. Incorporation of some conformation traits along with body weight is expected to give better results than selection basing on body weight alone (Jambui *et al.*, 2017). Therefore, heritability and correlations (genetic, phenotypic and environmental) among the body weight and body measurements were estimated as a preliminary step in a colored synthetic sire line flock which has undergone direct selection for juvenile body weight.

MATERIALS AND METHODS

The data utilized in the present investigation were collected from a flock of color synthetic sire line broiler chicken maintained at the AICRP on Poultry Improvement, Orissa University of Agriculture and Technology, Bhubaneswar, located at College of Veterinary Science and Animal Husbandry, Bhubaneswar, Odisha. Informations were obtained from 2752 progenies (1432 males, 1320 females) produced from 62 sires and 496 dams. The chicks were produced in several hatches at an interval of 10 days.

The least squares procedures outlined by Harvey (1966) was used for adjustment of hatch effect. The heritability for each trait was estimated using variance component analysis from half sib correlation for male and female progenies, separately. The genetic, phenotypic and environmental correlation of 5th week body weight with the conformation traits were estimated using variance

and covariance components analysis. The standard error of the genetic correlation was calculated as per Robertson (1959) while the method given by Goulden (1962) was followed for calculating the standard error of phenotypic correlation. The environmental correlation was calculated as per Becker (1975).

RESULTS AND DISCUSSION

The heritability estimates for different traits are presented in Table 1. The heritability of juvenile body weight from sire component was lower in males and females (Table 1). Similar observations were made by Singh *et al.* (2000) and Kishore *et al.* (2002). The magnitude of heritability of conformation traits from sire component of variance were similar in magnitude (Table 1). Lower estimates of heritability in conformation traits indicated that non-additive genetic variance did not seem to be important in these characters. Lien (1973) and Aggarwal *et al.* (1980) observed similar h^2 estimates for the measurement traits as in the present study.

Table 1: Heritability±SE estimate of body weight, breast angle, shank length and keel length at five weeks of age in colored synthetic sire line broiler chicken

Traits	Male	Female
Body weight at day old of age	0.062±0.043	0.047±0.030
Body weight at 5 weeks of age	0.620±0.139	0.530±0.126
Breast angle at 5 weeks of age	0.226±0.071	0.378±0.100
Shank length at 5 weeks of age	0.093±0.048	0.176±0.065
Keel length at 5 weeks of age	0.227±0.071	0.284±0.083

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Table 2: Genetic, phenotypic and environmental correlations between different traits and standard errors

Correlation between	Male			Female		
	r_g	r_p	r_e	r_g	r_p	r_e
Day old weight and 5 th week weight	0.108±0.274	0.010 ^{NS} ±0.001	0.0085	0.139±0.264	0.041 ^{NS} ±0.001	0.033
Body weight & breast angle at 5 weeks of age	0.809**±0.065	0.215*±0.001	-0.018	**0.597±0.114	0.159±0.001	-0.063
Body weight and shank length at 5 weeks of age	0.799**±0.076	0.155±0.002	0.016	0.508±0.256	0.146±0.001	0.028
Body weight and keel length at 5 weeks of age	0.722**±0.324	0.102±0.001	-0.150	0.432±0.324	0.211*±0.001	0.124

(NS-Non-Significant, ** P<0.01)* P<0.05

The genetic, phenotypic and environmental correlations are presented in Table 2 along with the standard errors. The genetic correlation between body weight at five weeks of age and each of breast angle, shank length and keel length were positive. The phenotypic correlations were also positive. A positive and high genetic correlation was estimated by Dutta *et al.* (1971) and Kumar (1979) for body weight and breast angle, Aggarwal *et al.* (1975) and Verma *et al.* (1979) for body weight and shank length and Tosovsky *et al.* (1975) for body weight and keel length. The phenotypic correlation between different traits were also positive and moderate. Correlations between the traits were exhibited both positive and negative association and very low in magnitude in environmental components. Results suggested that a selection index considering body weight, breast angle, shank length and keel length at five week of age is expected to give better results than selection for body weight alone in this synthetic sire line broiler chicken while developing a parent line (sire and dam line) traits (conformation traits) other than primary traits should be given due importance for the survival of commercials at field. Also the genetic & phenotypic estimates obtained in this study suggest selection index method to evaluate the genetic merit of the sire line.

Since most of the workers are now working on molecular genetics, recent references in biometrical genetics are scanty.

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