ESTIMATES OF GENETIC PARAMETERS FOR BODY WEIGHT AND SHANK LENGTH IN ASEEL CHICKEN

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ABSTRACT

Data on body weight, thigh length and shank length at eighth week from 237 Aseel birds were used for this study. The effects due to hatch and sex were found to be highly significant (P<0.01) on these traits except non-significant hatch effect on thigh length. The data were corrected for the fixed effects of hatch and sex for the estimation of heritability for these traits by paternal half-sib correlation method and Derivative Free Restricted Maximum Likelihood (DFREML) procedure. The heritability for these traits estimated by both the models were very low, non-significant and not different from zero.

KEYWORDS: Aseel, shank length, body weight, heritability

INTRODUCTION

Information regarding heritability estimates is very useful in animal breeding as a means to predict potential response to selection. Since production traits are inter-related, considerations of such relationships are very relevant to choosing appropriate selection method. Aseel birds are mainly reared for fighting and meat purpose and selected based on the thigh length, shank length and body weight. Hence this study was under taken to estimate the genetic variability and assess the sequence for improving the Aseel flock maintained at Institute of Poultry Production and Management (IPPM) by conventional selection.

MATERIALS AND METHODS

Data on body weight, thigh length and shank length at eighth week from 237 (116 males and 121 females) Aseel birds maintained at IPPM, TANUVAS, Chennai-51 were used for this study. These birds were from 2 hatches and 11 sire families. Body weight was taken for individual live birds. Shank length was taken as the distance between the hock joint to the tarsometatarsus and thigh length was taken as the distance between the hock joint and the pelvic joint. The least-squares means for thigh length, shank length and body weight at eighth week were estimated. The data were corrected for the significant fixed effects of hatch and sex for the estimation of heritability for these traits by paternal half-sib correlation method (Becker, 1984). The same data set was subjected for estimation of heritability by animal model using Derivative Free Restricted Maximum Likelihood (DFREML) procedure (Meyer, 1993). The heritability was estimated by univariate analysis incorporating only additive genetic effect in the model and genetic correlation for thigh length, shank length and body weight were also studied.

RESULTS AND DISCUSSION

The effects due to hatch and sex were found to be highly significant (P<0.01) on shank length and body weight except non-significant hatch effect on thigh length. The least-squares means for thigh length, shank length and body weight at eighth week were 8.96±0.08 cm, 6.21±0.06 cm and 540±7 g in males and 8.37±0.08 cm, 5.84±0.06 cm and 464±7 g in females. The thigh length, shank length and body weight at eighth week were more in males. The heritability estimates were 0.074±0.116, 0.016±0.093 and 0.033±0.099 for thigh length, shank length and eighth week body weight

respectively. The heritability estimates values are shown in Table.1. Comparatively, heritabilities in this study were lower than the values obtained by Adeleke et al. (2011) and these values were 0.16 for thigh length, 0.70 for shank length and 0.39 for body weight at 8 weeks of age in Nigerian indigenous chicken. Foleng et al. (2006) obtained the estimated heritability of 0.40 and 0.37 for body weight for light and heavy chickens, respectively.

Table: 1. Heritability estimates values for various parameters

Heritability for traits	Paternal half-sib correlation method	Derivative Free Restricted Maximum Likelihood (DFREML)
Thigh length	0.074±0.116	0.064±0.122
Shank length	0.016±0.093	0.012±0.090
Eighth week body weight	0.033±0.099	0.030±0.100

Estimation of heritability by DFREML

The heritability estimated by animal model **(**DFREML) were 0.064±0.122, 0.012±0.090 and 0.030±0.100 for thigh length, shank length and eighth week body weight respectively. The heritability for these traits estimated by both the models were very low, non-significant and not different from zero. The low heritability at 8 week of age also indicates less genetic variability among the chicks. The heritability estimates obtained in this study fall within the range reported by Momoh and Nwosu (2008) in Nigerian local chicken. Adeleke *et al. (2011)* observed that Keel length had low to high heritability with the highest value of 0.63 at eight weeks of age in Nigerian local chickens. The genetic correlations among these traits were beyond the possible values of +1 and -1 except that between shank length and body weight (-0.739±2.541). However, the standard error related to this estimate was very high. The low heritability at 8th week of age also indicates less genetic variability among the chicks. This above study shows that individual/mass selection of birds for these traits would not yield any genetic improvement and it can be improved by introducing superior germ plasm from outsourcing. The low heritability estimates observed could be due to non-genetic effects such as dominance and epistasis.

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