



Genetic and phenotypic correlation among body weight at various ages and among the reproductive traits in landrace desi and their cross-bred pigs

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Introduction

The phenotypic correlation among body weight at various ages in Landrace, desi and their half-breeds besides data pooled over all genetic groups were positive and significant in majority of cases but genetic correlations among body weight at various ages were positive and high but no specific trend. In reproductive traits the phenotypic correlation of age at first farrowing with litter size at birth, litter weight at birth and litter weight at weaning were non-significant in each genetic groups separately. The phenotypic correlation of age at first farrowing with farrowing interval was positive in desi and Landrace genetic groups. The genetic correlation of age at first farrowing with litter size at birth and at weaning are in general negative and low where its relation with farrowing interval was also negative. The phenotypic correlation among litter size and litter weight at birth and at weaning had positive and high except with farrowing interval. The genetic correlations were also positive and high in majority of cases. Litter size and Litter weight at birth and at weaning had positive and high phenotypic correlation in majority of cases except with farrowing interval. Genetic and phenotypic correlation between two traits were calculated from analysis of variance and covariance by parental half-sib correlation method as describe by Backer(1975). Measure of associates between two traits is the phenotypic correlation which is the correlation between the performances in each trait. It reflects the extent to which performance in one trait is associated with the performance with the other traits. Correlated characters are of interest for three chief reasons. (I) Connection with the genetic cause of correlation through the pleiotropic action of genes. (II) Connection with the change brought by selection and (III) Connection with natural selection. The relationship between a metric character and

fitness is the primary agents that determine the genetic properties of that character in natural population.

Materials and Methods

The present study was carried out on 1301 pigs spread over a period of 20 years from 1982 to 2001 belonging to three genetic groups viz. Landrace(378), Desi (288) and their half breeds (625) maintained at pig breeding farm Ranchi veterinary college (Jharkhand). The pre-weaning and post-weaning body weight were recorded at 4-weekly interval from birth to 24th week of age. The weaning was done at the age of 8th weeks. The year was divided in to 4 season on the basis of climatological data viz., Winter (December to February-Cold), Summer (March to May-Hot dry), Rainy(January to August-Hot humid) and Autumn (September to November-Moderate). The whole data were grouped in to 4 periods comprising of 5 years in each period viz., P1(1982 to 1986) P2 (1987 to 1991), P3(1992 to 1996) and P4(1997 to 2001). The suckling piglets were provided with creep feed in creep box after 2 weeks of ages. Least squares-analysis was done to see the effect of genetic and non-genetic factors on weight at different ages. Duncan Multiple Range Test (DMRT) as modified by Kramer(1957) was used for pair wise comparison of different effects .

Results and Discussion

Growth traits

Phenotypic and genetic correlation among body weight at different ages:- The phenotypic correlation among body weight at various ages in each genetic group separately besides data pooled over all the genetic group were positive and significant . Significantly positive correlation between weights at different ages showed that the

factors which were responsible for body weight at initial stage are also responsible for body weight at latter stages. Positive and significant phenotypic correlation among weight at different ages were also reported by Sukhdeo et al.(1981), Mukhopadhyay et al.(1991), Pandey et al. (1997), Kumar(1999), and Khalkho(2004) in exotic, desi and crossbred pigs. The genetic correlation among body weight at different ages were high and positive. Positive and high genetic correlation among weight at different ages were also reported by Sukhdeo et al.(1981), Mukhopadhyay et al.(1991), Pandey et al. (1997), Kumar(1999), and Khalkho(2004) in exotic desi and their crossbreds. The variations in present finding in different genetic groups separately might be due to the sampling fluctuation and genetic structure of the population.

Reproductive traits

Correlation of age at first farrowing (AFF) with litter size, litter weight at birth, at weaning and farrowing interval:- Phenotypic correlation of age at first farrowing with litter size and litter weight at birth and at weaning were non-significant but its relation with farrowing interval were negative. Kumar(1999), reported negative and non-significant correlation of age at first farrowing with litter size, litter weight at birth and at weaning, whereas farrowing interval was non-significant in majority of cases. Similarly, genetic correlation of AFF were negative and low with litter size and weight at birth and at weaning where as its relation with farrowing interval was positive. Kumar(1999) reported negative correlation of AFF with all the traits except farrowing interval in majority of cases. Correlation of litter size at birth with litter size at weaning, litter weight at birth and at weaning and farrowing interval:- Litter size at birth had negative correlation with litter size at weaning, litter weight at birth and weaning (Table). This is similar with the findings of Mukhopadhyay et al. (1992) and Kumar (1999). The phenotypic correlation of litter size at birth with farrowing interval was non-significant. In general, the genetic correlation of litter size at birth with litter size at weaning, litter weight at birth and at weaning was positive and high, Mukhopadhyay et al. (1992), and Kumar

(1999), also reported similar findings. Correlation of litter size at weaning with litter weight at birth and at weaning and farrowing interval:-The phenotypic correlation of litter size at weaning with litter weight at birth and at weaning and farrowing interval had negative and non-significant effect. Mukhopadhyay et al. (1992) and Kumar (1999) also reported similar results. Correlation between litter weight at weaning and farrowing interval:-The phenotypic correlation between litter weight at weaning and farrowing interval was positive and non-significant. Correlation of litter weight at birth with litter weight at weaning and farrowing interval:-Litter weight at birth had negative phenotypic correlation with litter weight at weaning. Correlation of litter weight at birth and farrowing interval were also negative. Mukhopadhyay et al (1992) and Kumar (1999) also recorded same result of phenotypic correlation between litter weight at birth and at weaning in exotic, desi and its crosses. The genetic correlation of litter weight at birth with litter weight at weaning was low and negative, Kumar (1999) also had similar result.

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