

ESTIMATION OF GENETIC FACTORS INFLUENCING GROWTH TRAITS IN GOAT BREEDS

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Abstract: The aim of this study is to estimate the genetic factor - correlation of body weights in goat breeds. The body weights at birth and at three, six, nine and 12 months and the average daily gains in live weights from birth until weaning and from weaning until the age of 12 months of four goat breeds over a period of 10 years were collected. Statistical analysis of the data was done using R version 4.0.2. The phenotypic correlations of the body weights ranged from low to high and positive (0.164903 to 0.95480). The phenotypic correlations of pre/post weaning average daily weight gains with body weights ranged from low to high and positive (0.092000 to 0.9213074). Heritability is not estimated due to less volume of data. This study may be further continued with increased number of breeds and data with additional parameters, to analyze the impact of genetic factors on growth traits which would provide useful information for optimization of breeding plans.

Keywords: Goat, Body weight, Average daily weight gains, Correlation, Genetic factors.

Introduction

Genetic improvement in livestock can be achieved by selection. Body weight is the most important selection criteria for the improvement of meat production in goat. The differences in body weight among the individuals are due to several genetic and non-genetic factors. It is very essential to measure the degree of these factors to analyze the genetic variation among individuals and thereby to formulate effective breeding plans for their future improvement. Knowledge of the genetic parameters is imperative for estimation of breeding values and increase the genetic gain [1]. There are limited published results on the estimates of genetic parameters for growth traits in goats. Hence this study is conducted with the objective of estimate the genetic parameters viz., Heritability and Phenotypic Correlation of body weight in goat breeds.

Materials and methods

The body weight records over a period of 10 years (2009 - 2018) of four goat breeds namely, Kanni Adu, Kodi Adu, Jamunapari and Tellichery maintained at Livestock farm complex, VCRI, Tirunelveli, Tamil Nadu, India were collected. The body weights at birth and at three,

*Received Jan 15, 2021 * Published Jan 20, 2021 * www.ijset.net*

six, nine and 12 months and the average daily gains in live weights from birth until weaning and from weaning until the age of 12 months of both male and females were estimated. Statistical analysis of the data was done using R version 4.0.2 (<https://www.r-project.org/>).

Results and Discussion

Phenotypic Correlation: The phenotypic correlation estimates for body weights at different ages and pre/post weaning average daily weight gains are presented in Table 1.

Table 1. Phenotypic correlation of different economic traits of Goat							
	B wt	W wt	6M wt	9M wt	12M wt	Pre W ADG	Post W ADG
B wt	1						
W wt	0.132092	1					
6M wt	0.363749	0.571647	1				
9M wt	0.164903	0.671729	0.95480	1			
12M wt	0.268837	0.894434	0.67037	0.837472	1		
Pre W ADG	0.092000	0.974646	0.65700	0.712082	0.8397592	1	
Post W ADG	0.171363	0.502287	0.68712	0.819193	0.9213074	0.4613017	1

The phenotypic correlations of the body weights ranged from low to high and positive (0.164903 to 0.95480) which means that as any one body weight is increase; the simultaneous increase is expressed in the other. The phenotypic correlations of pre/post weaning average daily weight gains with body weights ranged from low to high and positive (0.092000 to 0.9213074). This indicated that selection for increased body weight at this age would result in genetic improvement in the subsequent ages. The present result of this study was in agreement with those reported in previous studies in other goat breeds namely, Tellicherry goat [2], Adani goat [3], Zaraibi goat [4], Draa goat [5] and Boer graded goat [6]. The results of estimation of correlation suggest that the body weight can be used as a selective criterion at earlier age to increase the genetic improvement of growth performance traits.

Heritability is not estimated due to less volume of data. This study may be further continued with increased number of breeds and data with additional parameters to analyze the impact of

genetic factors on growth traits which would provide useful information for optimization of breeding plans.

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