

Short Communication

Correlation and Regression Coefficient Estimates between some Growth Performance Traits of Harnai Sheep

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Abstract. Present investigation was carried out to estimate the correlation and regression coefficient estimates between some growth performance traits of Harnai sheep. The available data was collected and maintained at Multipurpose Sheep Research Centre Yetabad, District Loralia, Balochistan, Pakistan. The data regarding growth traits including birth weight, yearling weight, weaning weight and fleeces weight was analysed for the estimation of correlation and regression coefficient. In present study the results for correlation and regression coefficient estimates were observed low to positive between some growth performance traits of Harnai sheep. Due to low results for correlation and regression coefficient, it is concluded that mass selection is advisable for achieving better performance in growth traits of Harnai sheep.

Keywords: correlation, regression coefficient, growth traits, Harnai sheep

Livestock sector of Pakistan considered as back bone of agriculture department. Small ruminant contributes a significant role in economy of country as well as provide livelihood to small scale farmers. At present 29.1 million sheep population is estimated with contribution of meat 657,000 tonnes, milk 38,000 tonnes, wool 44.1 million and skin 11,001 million, respectively, (Farooq, 2014). There are 4 different sheep breeds of Balochistan Harnai, Baluchi, Rakshani and Bevrigh. Harnai sheep is a major fat tail sheep breed of Balochistan province and commonly found in district Loralai, Ziarat, Harnai and Sanjawi districts of Balochistan. Harnai sheep is medium sized breed mostly kept for meat purpose (SMEDA, 2011). For the development of effective genetic improvement programme, it is necessary to acquire knowledge about the genetic parameters including correlation, regression coefficient, heritability and repeatability (Bilgin *et al.*, 2004). The estimation of correlation and regression are two main genetic parameters, which helps the breeder for selection and establishment of future breeding programmes (Babar *et al.*, 2003). Keeping in the view importance of growth traits of Harnai sheep and genetic parameters, present study was designed to estimates

the correlation and regression coefficient between some growth traits of Harnai sheep.

In present study the data was collected from Multipurpose Sheep Research Centre Yetabad, District Loralia, Balochistan. The data regarding the growth performance traits including birth weight, yearling weight, weaning weight and fleece weight was brought under the study for the estimation of correlation and regression coefficient.

The correlation and regression estimation was analysed according to the formula suggested by Becker (1984).

The correlation coefficient between the growth performance traits has been worked out according to the formula:

$$r_{xy} = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{[\sum x^2 - \frac{(\sum x)^2}{n}][\sum y^2 - \frac{(\sum y)^2}{n}]}}$$

where:

r = coefficient of correlation; $\sum xy$ = sum of the product of x and y variables; $\sum x$ = sum of the x variable; $\sum y$ =

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sum of y variable; Σx^2 = sum of the squared value of x; Σy^2 = sum of the squared value of y; $(\Sigma x)^2$ = square of sum of x variable; n = number of records/ observations.

The regression of dependent variable, y on independent variable, x will be calculated by using the formula:

$$b_{yx} = \frac{\Sigma xy - \frac{(\Sigma x)(\Sigma y)}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}$$

The results for correlation estimation between some growth traits of Harnai sheep. The results of correlation estimation between some performance traits were observed low and positive among different growth traits of Harnai sheep except it was found medium and positive between birth weight and weaning weight. The details are presented in Table 1.

Results for regression coefficient between some growth traits of Harnai sheep. Results for regression coefficient of some growth performance traits of Harnai sheep were observed low and positive among different growth traits of Harnai sheep except it was found medium and positive between birth weight and weaning weight. The details are presented in Table 2.

Correlation coefficient. In current study results for the estimation of correlation and regression coefficient were observed low and positive excepting the results of correlation and regression coefficient between birth

weight and weaning weight were observed positive and medium. Results of the current study are controversial to the findings of Raza *et al.* (2017) and Tahir *et al.* (2016) who reported higher values for correlation and regression estimates between birth, weaning, yearling and fleece weights of Kacchi and Bibrik sheep breed. They have reported that due to inbreeding depression and unfavourable management conditions low values of correlation and regression estimates can be observed. Findings of our research are partially supported by Rastogi (2001) and Akhtar *et al.* (2010), who observed low, medium and positive values for performance traits of Black sheep and Mengali sheep breeds. The reported difference among the results of different studies may be due to size of herd, genetic potential of individual breed and management disorders and also due to the size of data. The findings of Lashari *et al.* (2010) and Nawaz *et al.* (1985) are in agreement with the findings of current research. The results of Bilgin *et al.* (2004) are higher as compared to results of the present study, who has reported higher values for correlation and regression coefficient between growth traits of Awassi sheep. The findings of other researchers depicted low results for correlation as well as regression estimates between birth, weaning, yearling and fleece weights of local sheep breed and Pak-Awassi sheep breeds. Another research was conducted by Parkash *et al.* (2012) who has been reported higher results for correlation and regression estimates between some growth traits of Malura sheep breed of India. The above mention difference among the researches may be due to high level of inbreeding and size of flock that may have also reduced the genetic variability among the animals and these problems can be solved through applying the different methods of selection to remove inbreeding and for the improvement of low level performance of individual as well as herd production. It is concluded that mass selection should be performed for better growth and production in future breeding plans.

Table 1. Correlation estimates between growth traits of Harnai sheep

Traits	Birth weight	Yearling weight	Weaning weight	Fleece weight
Birth weight	1	-	-	-
Yearling weight	0.6245	1	-	-
Weaning weight	0.0556	0.0519	1	-
Fleece weight	0.1298	0.0988	0.0588	1

Table 2. Regression co-efficient between some performance traits in Harnai sheep

Traits	Birth weight	Yearling weight	Weaning weight
Yearling weight	0.3903	-	-
Weaning weight	0.0031	0.0027	-
Fleece weight	0.0169	0.0098	0.0035

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