

## Research Article

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# Study on correlation estimates between carcass traits of sheep breeds of Baluchistan

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### Abstract

The correlation estimation among carcass trait is highly valuable to decide single and multiple trait selection strategy. The estimation of correlation is important genetic parameter, which helps the breeder for selection and establishment of future breeding program. For this purpose, total 120 male animals with 30 animals from each breed were randomly selected from four different sheep farms of Baluchistan. The Animals were divided into 4 different groups on the basis of breed differences A, B, C and D Balochi, Rakhshani, Harnai and Bibrik sheep, respectively. The randomly selected animals were slaughtered to observe the carcass weight and for correlation analysis. The results for correlation estimates among live body weight vs CW, DP, BmW, BW; CW vs DP, BmW, BW; DP vs BMW; BW; BmW vs BW for Balochi, Rakhshani, Harnai and Bibirk breed were ranged moderate to high and positive. The correlation result for carcass traits of Balochi, Rakhshani, Harnai sheep breed revealed strong and positive relationship between different carcass traits except Harnai sheep breed which have moderate and positive results. Whereas the results for correlation estimates among bone weight of Bibrik sheep breed were observed moderate and positive between some carcass traits which may be due to inbreeding method were applied in the farm. It is concluded that Balochi, Rakhshani and Bibrik breed produces more carcass weight as compared with Harnai sheep.

**Keywords:** Baluchistan; Carcass; Correlation; Sheep breed

## Introduction

The livestock sector played a major role in economy of Pakistan with share of 56.3% to agriculture sector value addition. It is estimated that more than 35 million numbers of peoples are involved with livestock business and contributing about 11% to national GDP. In this way to maintain and increase the sustainability of agriculture development, it is a major task for the government of Pakistan to pay attention on livestock sector and its production including milk, meat, eggs, manure, hides, fiber and horns [1, 2]. However, due to extreme poverty situation and lack of education system in different areas has interest for sheep farming that can lead to a major and strong small ruminant industry of this province. There should be a scientific approach for adopting and applying various modern methods for sheep rearing which will make a major breakthrough for farmers of Baluchistan [3, 4]. Baluchistan is highly favorable province for raising of small ruminant particularly sheep because of its large areas of rangeland geographical and climatic situations [5, 6]. There are 30 sheep breeds found in Pakistan among them four major and well known recognized fat tail sheep breeds Balochi, Bibrik, Rakhshani and Harnai are commonly reared in Baluchistan for milk and meat purpose [7]. The improvement in genetic parameters is mainly depending on the phenotypic and genetic correlation with various traits [8, 9]. Information about relationship is beneficial when associated traits could be considering for selection, if the correlation among traits observed positive and high, the selection would results improvement of other various related traits [10]. This study was aimed to estimate the correlation among carcass traits of Balochi, Rakhshani, Harnai and Bibrik sheep breeds of Baluchistan surely will help to observe the level character related and

possibilities for making improvement of particular traits could be possible.

## Material and methods

### Animal and their management

Present research was conducted to analysis the correlation among carcass traits of Balochi, Rakhshani, Harnai and Bibrik sheep breeds of Baluchistan. For this purpose, total 120 male animals with 30 animals from each breed Balochi, Rakhshani, Harnai and Bibrik sheep breed were randomly selected from their respective areas of four different sheep farms of Baluchistan. Animals were divided into four groups on the bases of breed differences A, B, C and D Balochi, Rakhshani, Harnai and Bibrik sheep, respectively.

### Phenotypic characteristics

Their phenotypic characteristics for breed confirmation, health status and age were confirmed by the formula suggested by [11, 12]. The randomly selected animals were slaughtered to observe the carcass weight and for further analysis.

### Data

After slaughtering the data were collected for different carcass parameters and tabulated for further analysis of different carcass traits such as live body weight, carcass weight, dressing percentage, boneless weight and bone weight.

### Correlation estimates

On completion, the data was typed, tabulated in MS Excel and correlation analyzed was performed using the computer software (SAS).

## Results

### Analysis of correlation among some carcass traits of sheep breed of Baluchistan

The results for correlation among birth weight vs carcass weight, dressing percentage, boneless weight and bone weight were recorded  $r = 0.67, 0.65, 0.63, 0.21$  carcass weight vs DP, Bmw and BW were found  $0.59, 0.62, 0.27$  dressing percentage vs

BmW and BW 0.53, 0.23 boneless weight vs BW were 0.29. The results for analysis of correlation among some carcass traits of Balochi breed showed strong and positive

relationship among carcass traits except bone weight which were low and positive. The details of findings are displayed below (Table 1).

**Table 1. Analysis of correlation between some carcass traits of Balochi breed**

Trait	Balochi sheep			
	Carcass weight	Dressing percentage	Boneless weight	Bone weight
Live body weight	r = 0.67	r = 0.65	r = 0.63	r = 0.21
Carcass weight		r = 0.59	r = 0.62	r = 0.27
Dressing percentage			r = 0.53	r = 0.23
Boneless weight				r = 0.29

**Correlation estimates among some carcass traits of Rakhshani sheep breed**

The results for correlation estimates between some carcass traits of Rakhshani sheep including live body vs CW, DP, BmW and BW were recorded r = 0.69, 0.61, 0.67, 0.19 carcass weight vs DP, Bmw and BW were found 0.57, 0.68, 0.25 dressing percentage vs

BmW and BW 0.49, 0.24 boneless weight vs BW were 0.21. The result for analysis of correlation among some carcass traits of Rakhshani breed showed strong and positive relationship among carcass traits except bone weight which were low and positive. The details of findings are displayed in (Table 2).

**Table 2. Correlation estimates among some carcass traits of Rakhshani sheep**

Trait	Rakhshani sheep			
	Carcass weight	Dressing percentage	Boneless weight	Bone weight
Live body weight	r = 0.69	r = 0.61	r = 0.67	r = 0.19
Carcass weight		r = 0.57	r = 0.68	r = 0.25
Dressing percentage			r = 0.49	r = 0.24
Boneless weight				r = 0.21

**Correlation estimates among some carcass traits of Harnai sheep breed**

The results for correlation estimates between some carcass traits of Harnai sheep including live body vs CW, DP, BmW and BW were recorded r = 0.57, 0.51, 0.55, 0.13 carcass weight vs DP, Bmw and BW were found 0.49, 0.61, 0.27 dressing percentage vs BmW and BW 0.47, 0.22 boneless weight vs BW were 0.17. The results for analysis of correlation among some carcass traits of Harnai breed were low and positive relationship among carcass traits including bone weight. The details of findings are displayed in (Table-3).

**Correlation estimates among some carcass traits of Bibrik sheep breed**

The results for correlation estimates between some carcass traits of Bibrik sheep including live body vs CW, DP, BmW and BW were recorded r = 0.69, 0.61, 0.65, 0.39 carcass weight vs DP, Bmw and BW were found 0.63, 0.67, 0.47 dressing percentage vs BmW and BW 0.62, 0.53 boneless weight vs BW was 0.17. The results for analysis of correlation among some carcass traits of Bibrik breed were strong and positive relationship among carcass traits including bone weight. The details of findings are displayed in (Table 4).

**Table 3. Correlation estimates among some carcass traits of Harnai sheep**

Trait	Harnai sheep			
	Carcass weight	Dressing percentage	Boneless weight	Bone weight
Live body weight	r = 0.57	r = 0.51	r = 0.55	r = 0.13
Carcass weight		r = 0.49	r = 0.61	r = 0.27
Dressing percentage			r = 0.47	r = 0.22
Boneless weight				r = 0.17

**Table 4. Correlation estimates among some carcass traits of Bibrik sheep**

Trait	Bibrik sheep			
	Carcass weight	Dressing percentage	Boneless weight	Bone weight
Live body weight	r = 0.69	r = 0.61	r = 0.65	r = 0.39
Carcass weight		r = 0.63	r = 0.67	r = 0.47
Dressing percentage			r = 0.62	r = 0.53
Boneless weight				r = 0.57

### Discussion

The findings of presented for analysis of correlation estimates between some carcass traits of four different sheep breeds of Baluchistan raised at various sheep farms were observed strong positive and high for live body weight, carcass weight, dressing percentage and boneless weight of Balochi, Rakhshani and Bibrik breeds, whereas the results for correlation estimates between some carcass traits of Harnai sheep breeds were low to moderate and positive. The findings of [13, 14] are in agreement with our study. They reported that male sheep animal produced more meat with strong and positive relationship with carcass traits in Dumbi and Bibrik sheep raised at Yetababd Government farm Balochistan and Nabisar Umar kot Government farm Sindh. The findings of [1, 15], reported that the descriptive statistics model for correlation estimates between carcass traits were ranged moderate to high and positive coefficient of variation. Their findings are in agreement with our study. The findings of [3, 16] are controversial with our results; they reported that mature animal body having higher fat deposition cause less red meat production as compared with lambs which have less fat deposited on body The findings of [3, 16], are controversial with our results, they reported that mature animal

body having higher fat deposition cause less red meat production as compared with lambs which have less fat deposited on the body of Italian crossbred heavy lambs and Mangali sheep breed of Baluchistan. They suggested that live weight of body was observed higher and carcass weight, dressing percentage and boneless weight were recorded low. It is therefore the results for correlation and regression coefficient estimates in their study were observed low to moderate and positive. The findings of [17-19] were in less agreement with findings of current study. They reported low to moderate and positive results for genetic correlation estimates. It has been suggested that correlation was observed low moderate or weak may be due to cold carcass weight. They hot carcass weight may have a strong and positive genetic correlation with other traits as well as price at different ages and fatness quality and condition of animals. The results of [20], their findings are in agreement with the result of current study. They reported that correlation estimates showed highly positive and strong measurement between live body weight and carcass traits. It has also been reported that correlation analysis was observed low and negative among different bone weight, live body, carcass weight,

dressing percentage and boneless weight in Italian and Baraqi sheep breeds [9, 10].

### Conclusion

The findings of our study suggested that there are many possibilities to improve the carcass quality and yield by genetic selection particularly mass selection and provide the specific population genetic parameters for estimation are required for genetic evaluation of different carcass traits of sheep breeds of Baluchistan.

### Authors' contributions

Conceived and designed the experiments: RR Kaleri & HA Kaleri, Performed the experiments: RR Kaleri & IA Khan, Analyzed the data: A Leghari, GM Solangi, RA Mangi, ZA Mangrio & MA Chandio, Wrote the paper: RR Kaleri, MA Gopang, DK Bhptani & MI Baloch.

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