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## EQUITABLE CHARACTERISTICS AND MANAGEMENT, STATUS, STANDARDS, AND PERFORMANCE PARAMETERS OF BIBRIK (BEVERIGH) SHEEP



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### Abstract

The present study was conducted to evaluate the biometric traits of Beverigh (Bibriki) sheep of Balochistan, Pakistan. The data for present study of Beverigh sheep (n=3198); rams (n=1294) and ewes (n=1904) were collected from 15 villages of three districts i.e., Duki, Harnai, and Loralai, whereas the data from Multipurpose Sheep Research Station, Yatabad (MSRSY), District Duki was also included in the study. For this purpose, a proforma was designed. Animal's body weight and other biometry measurements were recorded. The Beverigh sheep is fat-tailed breed and mostly domesticated for meat purpose. This breed has high adaptability to climate of the province. Beverigh sheep has stout body structure which helps the animal to survive in hard climatic conditions of the province. Sex has significant effect (P<0.05) on average body weight, heart girth, rump height, wither height and tail length. Beverigh sheep farming is quite preferred by the local farmers due to its adaptability, great survival rate, growth performance and especially for the pleasing taste of mutton of this breed. It was concluded that inspired positive performance traits were found, however financial returns from sheep production are marginal and low-cost production is still a challenge for researchers.

**Keywords:** Biometry, Measurements, Morphological characters, Performance parameters

## INTRODUCTION

Livestock is a sub-sector of Agriculture which contributes approximately 56% of Pakistan value addition in agriculture and nearly 11% to the gross domestic product (GDP) with involvement of 35 million people in this sector. Balochistan province comprises of arid and semi-arid lands, makes about 44% of the total geographical area of country. Only 5% of the land is cultivated and only 2.5% is cropped (1) Livestock is one of the major important sectors, and cover about 20% of the national stock of Pakistan. In some areas, it is only livelihood activity that enables people to survive. Balochistan is the nucleus of many valuable livestock breeds and play essential role in the socio-economic survival for its residents (2)

In Pakistan, thirty-one different breeds of sheep are present, out of which five fat-tailed breeds are present in Balochistan i.e., Beverigh, Balochi, Harnai, Rakhshani and Mengali, (3). Sheep population in Pakistan comprises 31million heads and 48.33% (14.98 million) are present in Balochistan province. The population of Beverigh sheep stands second highest is estimated 1.77 million leads by Balochi 4.00 million. Other prominent sheep breeds include Harnai 0.59 million and Rakhshani 0.043 million in the province (1).

Beverigh sheep primarily found in Balochistan province, well adopted to the local climate of Loralai, Harnai, Sibi and Duki districts. This breed is well adapted to harsh climate, tough conditions, and unfavorable environment of the province. When we compare the performance of this breed with other local breeds of Balochistan then one can easily assess that improvement in the productivity of this breed need to be addressed. However, this breed has already adequate prospective phenotypically as well as genotypic associate to be a good mutton breed in this region. From 1996-2015 the growth percentage of sheep was 0.12 in Pakistan and the same increase was found in Balochistan (4). Increase in percentage of sheep population shows that the farming of this breed has also amplified in the Province. Meat and milk are very important for every human being for their growth and daily body maintenance. Different production systems have been adopted by the farmers of the areas according to their climate, environments, and socio-economic conditions, mostly depends on grazing patterns, feeding practices, seasonal dissimilarity, sexual behavior, and sometimes individual variations play vital role (3 & 5). The Livestock breeders know the importance of breed and can well define the characteristics and special traits. Local livestock breeds have well adoptability with the local ecology; diseases and each breed have its own special trait (2). The present study focused to highlight the performance of Beverigh sheep breed maintained in different districts of Balochistan. The data collected will be helpful for designing strategies for breed improvement and conservation.

## MATERIAL AND METHODS

Present study was designed to assess qualitative and quantitative characteristics of Beverigh sheep breed of Balochistan. Data of n=3198 sheep, out of 3198, rams were 1294, and ewes were 1904, from four selected areas were obtained and recorded (Table I). Sheep were weighed by weighing balance ( $\pm 500$  gms) and biometry measurements were taken through Nasco measuring tape for sheep and goat made by USA ( $\pm 1$ cm).

**Table I.** Data of Three Districts Of Bibrik Sheep Habitat Including MSRSY

Name of District	No of Villages	Male	Female	Total
MSRSY	-----	399	805	1204
Duki	15	298	298	596
Harnai	15	298	298	596
Loralai	15	299	503	802
Grand Total	45	1294	1904	3198

## BASE LINE STUDY

This study was completed in one year (January, 2018 to December, 2018) in the Beverigh breed populated districts viz. (Duki, Harnai and Loralai) of Balochistan province. From each district fifteen villages were visited for this base line study. For the purpose a comprehensive proforma was designed to collect data regarding the habitat, breeding, feeding, housing, management, production system, utility outlines, qualitative and quantitative traits

## QUALITATIVE CHARACTERISTICS

Sex, body coat, color pattern of sheep was recorded. Further, disease control measures and utility of this breed was documented.

## QUANTITATIVE CHARACTERISTICS

Body weight (Bw) and measurement of heart girth (HG), body length (BL), rump height (RH), wither height (WH), ear length (EL) and tail length (TL) of animals, present at villages were gathered randomly. The collected data were summarized using MS-Excel and analyzed using ANOVA and t-test in SPSS-16 for windows.

## RESULTS AND DISCUSSION

### PHYSICAL APPEARANCE

From the data collected it was revealed that this breed is of medium size, compact body, white in color, neck having black or brown patches as well as on ear tips, muffle, and eyes. Belly of animals are somewhat pendulous. The wool is white in color and coarse in quality.

## REPRODUCTIVE PERFORMANCE

Breeding of Beverigh sheep was carried out by natural mating as this was also practiced in Balochi breed (6, 7). Generally, one breeding ram is kept for 30 ewes, and remaining males are generally sold either for breeding purpose to needy farmers or slaughtered for meat purposes. The remaining male stock are sold out on the occasion of Eid-ul-Azha. Average age of maturity at MSRSY, Duki, Harnai and Loralai was  $297.81 \pm 31.35$ ,  $309.89 \pm 33.88$ ,  $301.43 \pm 35.22$  and  $302.21 \pm 50.08$  days for rams and  $259.48 \pm 18.00$ ,  $315.63 \pm 46.98$ ,  $279.69 \pm 19.80$  and  $264.52 \pm 31.81$  days respectively for ewes (Table 2). No significant difference ( $P > 0.05$ ) in age of maturity of sheep was revealed among different stations.

**Table II.** Age of maturity of Beverigh sheep (male=1294) and female (n=1904) from three districts and MSRSY Balochistan

Age of Maturity	Male			Female		
	Ave	Min	Max	Ave	Min	Max
MSRSY	$297.81 \pm 31.35$	240	370	$259.48 \pm 18.00$	210	330
Duki	$309.89 \pm 33.88$	210	440	$315.63 \pm 46.98$	260	510
Harnai	$301.43 \pm 35.22$	240	400	$279.69 \pm 19.80$	240	360
Loralai	$302.21 \pm 50.08$	210	450	$264.52 \pm 31.81$	200	350

The ewe, on average delivers 6-9 lambs in her lifespan. Almost analogous results were reported by a researcher (6 & 8). Most of the farmers allow mating from October to November or maximum up to mid of December and thereafter lambing took place in February and March. During these months maximum numbers of births were recorded. In present study, the twinning percentage was 4% at MSRS, Duki and 3% was recorded in Harnai and Loralai. The twinning ratio 3.20% was reported in Balochi sheep (6). In another study, the twinning percentage of experimental station and field farmers of Mengali sheep was estimated as 5.25% and 3.55% respectively. Twinning percentage depends upon good nutrition, and annual rain fall (3).

## HEALTH MANAGEMENT

The data collected revealed that some of Beverigh sheep breeders of the area do not vaccinate their valuable animals against different diseases, generally due to lack of awareness and sometimes due to poor financial conditions. Certain contagious diseases like Foot and Mouth, Anthrax, Enterotoxaemia, and many parasitic infestations affect the sheep flocks of the area (9). This aspect needs an immediate attention to save these precious animals.

## UTILITARIAN

The breed under study is mostly kept for getting meat, milk, and wool. This breed has an average wool yield 1.70 kg per annum, having course type fiber of diameter 41.5 micron. Sheep covers a foundation of income and guide a track the profession as a trade on national and international levels. These animals are commonly slaughtered on celebrations, festivals, anniversaries, and religious occasions like Eid-ul-Azha. Livestock farmers utilize wool to prepare hand-netted covers, carpets, mats, rugs as well as sold in market as raw material. In cold areas of the province, making of Landhi (Dried meat) is a symbol of pride and a unique tradition used during winter season. However, other food items like yogurt, cheese, and some local food items like Lassi, Ghee, and Krut are also prepared for routine usage at homes from milk, similar findings were reported by the researcher (3). In another study, (10) analyzed the household consumption patterns and demands elasticities of Balochistan in both the urban and rural areas.

## BIOMETRIC PERFORMANCE

The results of biometric performance of this study are presented in Table III, IV and V.

**Table III.** The effect of sex on biometric measurements of Beverigh sheep (Mean±SEM)

Variable	Ram	Ewe	p-Value
Body Weight (kgs)	37.55 ± 0.071	29.65 ± 0.037	0.00
Heart Girth (Cm)	72.68 ± 0.106	65.54 ± 0.196	0.00
Body Length (Cm)	65.83 ± 0.096	61.25 ± 0.126	0.432
Rump Height (Cm)	59.57 ± 0.083	56.61 ± 0.099	0.00
Wither Height (Cm)	60.95 ± 0.087	58.04 ± 0.096	0.00
Tail Length (Cm)	25.82 ± 0.054	22.94 ± 0.074	0.00

**Table IV.** Live body weight and biometric parameters of Rams Beverigh sheep Balochistan.

Parameters	Weight (kgs)	Heart Girth	Body Length	Rump Hight	Wither Hight	Tail Length
MSRSY	40.14±0.081 <sup>a</sup>	71.38±0.138 <sup>b</sup>	65.65±0.163 <sup>a</sup>	60.89±0.175 <sup>b</sup>	58.69±0.122 <sup>c</sup>	26.56±0.087 <sup>a</sup>
Duki	38.55±0.057 <sup>b</sup>	71.03±0.134 <sup>b</sup>	65.78±0.204 <sup>a</sup>	61.46±0.176 <sup>a</sup>	60.11±0.189 <sup>a</sup>	25.43±0.118 <sup>c</sup>
Harnai	36.56±0.052 <sup>c</sup>	74.45±0.260 <sup>a</sup>	65.86±0.213 <sup>a</sup>	60.35±0.161 <sup>c</sup>	59.64±0.177 <sup>b</sup>	25.27±0.110 <sup>c</sup>
Loralai	34.10±0.049 <sup>d</sup>	74.28±0.235 <sup>a</sup>	66.09±0.198 <sup>a</sup>	60.13±0.172 <sup>ab</sup>	60.15±0.179 <sup>a</sup>	25.76±0.110 <sup>b</sup>
P-Value	0.00	0.00	0.432 NS	0.00	0.00	0.00

\*Different superscript in each column shows significant difference ( $P<0.05$ )

**Table V.** Live body weight and biometric parameters of Ewes Beverigh sheep Balochistan

Locality	Weight (Kg)	Heart Girth (Cm)	Body Length (Cm)	Rump Height (Cm)	Wither Height (Cm)	Tail Length (Cm)
MSRSY	30.80±0.049 <sup>a</sup>	58.13±0.088 <sup>d</sup>	56.55±0.070 <sup>d</sup>	55.51±0.068 <sup>b</sup>	53.54±0.066 <sup>c</sup>	19.98±0.066 <sup>c</sup>
Duki	28.80±0.074 <sup>bc</sup>	71.12±0.413 <sup>b</sup>	65.61±0.193 <sup>b</sup>	61.45±0.175 <sup>a</sup>	60.10±0.189 <sup>a</sup>	25.42±0.117 <sup>a</sup>
Harnai	28.68±0.078 <sup>c</sup>	63.44±0.246 <sup>c</sup>	61.26±0.260 <sup>c</sup>	55.37±0.231 <sup>b</sup>	54.96±0.238 <sup>b</sup>	24.64±0.135 <sup>b</sup>
Loralai	28.91±0.054 <sup>b</sup>	75.32±0.216 <sup>a</sup>	66.20±0.194 <sup>a</sup>	61.65±0.147 <sup>a</sup>	60.43±0.147 <sup>a</sup>	25.20±0.091 <sup>a</sup>

Analysis of data shows a significant difference ( $P<0.05$ ) in BW, HG, BL, RH, WH and TL among different locations (Table 4). These values were highest in rams at MSRSY viz 40.14±0.081kg, 75.32±0.216, 66.83±0.198 cm, 61.13±0.172 cm, 60.13±0.172 cm, and 26.56±0.087cm; while, in ewes these values were 30.80±0.049 kg, 58.13±0.088cm, 66.20±0.194cm, 60.43±0.147cm, 61.65±0.147cm and 25.42±0.117cm respectively. In rams the lowest values recorded at Loralai were 34.10 ± 0.049kg, 74.28±0.0235cm, 65.65±0.163cm, 60.89±0.175cm, 60.89±0.175cm, and 25.76±0.11. The highest values recorded in ewes at MSRSY were 30.80±0.049kg, 58.13±0.088cm, 66.20±0.194cm, 60.43±0.147cm, 61.65±0.147cm, and 25.42±0.117cm respectively. In ewes the values were at lowest level at Loralai viz 28.91±0.054 kg, 58.13±0.088cm, 56.55±0.070cm, 53.54±0.066cm, 55.41±0.068cm and 19.98±0.066 respectively. Some environmental factors such as season of breeding and lambing, birth weight was also found significant effect on above mentioned parameters. Birth, weaning, and yearling weight averaged as 2.79±0.05, 18.44± and 36.70±0.33 respectively. The effect of year and season of birth, sex type of birth and age of dam was studied by least square analysis of variance. (1). The effect of seasons observed (8) on Bibrik sheep showed that the birth weight was 2.50±3.88 and yearling weight was 36.28±2.44 in spring season and 3.22 ± 4.88 and 38.44 ± 3.88 was in winter respectively at MSRS Yetabad. Heritability and correlations were estimated between lamb body weight at different ages and reproductive traits in Lori-Bakhtiria sheep breed in Iran. The estimates of direct heritability for lamb body weights were 0.31±0.02 at birth, 0.10± 0.02 at weaning and 0.19 ± 0.02 at six months of age and estimates of maternal heritability were 0.22 ± 0.02, 0.16 ± 0.02 and 0.04 ± 0.02, respectively (3 and 16). The findings studied on, 5 breeds (Beverigh, Balochi, Rakhshani, Harnai and Mengali) from different areas of the province shows significant difference in heart girth, body length, and with height under semi-intensive

farming (6). It was also observed that, sheep kept under semi-intensive environments adopted by some progressive livestock farmers proved too, has positive impact on the performance traits but may increase the production cost. Pearson Correlation Coefficients among all biometrical characteristics obtained for Beverigh sheep are summarized in Table 6. Highest correlation was found between bodyweight and heart girth (0.815); while high to medium correlation was observed among other traits.

**Table VI:** Bivariate correlation of biometric characteristics of Beverigh sheep

Variable	Heart Girth (Cm)	Body Length (Cm)	Wither Height (Cm)	Rump Height (Cm)	Tail Length (Cm)
Heart Girth (Cm)		0.815**	0.680**	0.764**	0.666**
Body Length (Cm)			0.665**	0.796**	0.663**
Wither Height (Cm)				0.738**	0.545**
Rump Height (Cm)					0.578**
Tail Length (Cm)					----

\*\* Significant correlation ( $P < 0.05$ )

Gender plays a significant role in the form and weight of sheep (Table 4). These results agreed with those reported by some different scholars (6, 11, 12, 14). A recent study of genetic trends for some productive traits of Lohi sheep in Pakistan, revealed the effect of year, season of birth, sex, type of birth and age of dam was recorded (11). Researchers also reported that chest girth is the best predictive equation for body weight in captured Stone's sheep (12) similar results was reported by another researcher (13 and 15).

Findings of biometric features of this study support the findings of (3), studied the biometry, profitable performance, and survival of Mengali sheep breed. They reported that male sheep have more weight and higher biometry measurements (heart girth, body length, rump height, wither height and tail length) when compared with females. In a research work (9), assessed the profitable performance of five breeds of sheep of Balochistan province and reported that these breeds have significantly different ( $P < 0.05$ ) heart girth, body length, rump height, wither height and tail length. Researchers also reported that heart girth is the excellent predictive tool for body weight in captured Stone's Sheep (13).

In this study most important work analysis not only be measured the qualitative and quantitative characteristics but it also focused to appraise the other potentials which give the animals some extra capability to flourish well in an extreme hard and drought conditions.

There are many parameters such as animal's nutrition, breeding practice, climatic conditions, some environmental factors, and traits which plays a very important role in breed characterization, especially study of reproductive performance. The importance of non-genetic features disturbing reproductive performance needs a detailed study program.

## CONCLUSION

The findings of the study indicated that the Beverigh breed is a descriptive breed having exclusive qualities. Animal rearing under semi-intensive atmosphere adapted by the progressive sheep owners reveals to be slightly expensive, but importance should be put on the improvement in reproductive management, nutrition, and breeding practices at the farms for better productivity and for the preservation of this precious local breed.

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