

Comparative study to estimate the productive performance of different sheep breeds of Balochistan in semi intensive conditions

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Abstract. The objective of the study was to explore the productive performance of the different breeds of sheep prevailing in different parts of the Balochistan province. Two hundred and forty (240) ram lambs of five different breeds were divided into 5 groups of 48 animals of same breed in each group used in the experiment. The animals were fed wheat straw *ad libitum*, green Barseem @ 3 kg/day/head and a commercial concentrate ration @ 0.20, 0.30, 0.35, 0.40 and 0.50 kg/day/head for five months period respectively. There was significant differences in total weight gain and average daily gain of breeds ($P < 0.05$). The results of the present study revealed that, weight gain of the Mengali and Balochi are significantly higher than other breeds ($P < 0.05$), while non significant ($P > 0.05$) between each other as well as Rakhshani and Harnai. Lowest weight gain was observed in Beverigh sheep. Biometric parameters of height, length and girth was observed significantly different among breeds ($P < 0.05$). Consistent growth performance was found in Mengali and Balochi as compare to others breeds. Variations in productive and biometric performance were due to genetic potential of breeds and environmental factors.

Key words: breed, biometric parameters, productive performance, weight gain.

Introduction. The breeds of sheep found in the Balochistan province are quite distinct from each other phenotypic, genotypic characters and adaptation to their distinct ecological zones. These factors significantly affect average daily weight gain during the fattening period for optimizing live weight gain and wool production (Mahajan et al 1976).

The productive and reproductive performance of sheep depends on many factors, especially genetic potential of a particular breed, availability of nutrition and environmental factors. Although, there is an availability of range of products as growth promoters, but still there are some strings attached to the use of these products. Growth promoters seem to have promising results, along with some disadvantages, especially those which are of hormonal origin, have been found to have adverse effects on human beings. Another disadvantage is the cost of the growth promoter. The alternative which is most suitable is still the wise use of available traditional feed concentrates along with roughages of good quality (Kochapakdee et al 1994).

For economical sheep farming, every aspect of the production chain needs to be addressed (Charray et al 1992). Due to recent development of new tools and technique in the modern husbandry practices, it is becoming relatively easier to explore the production potential of sheep. The objective of the study was to estimate the growth performance of sheep breeds of Balochistan in semi-intensive system and adoptability to rather different environment from their natural homeland.

Material and Method. The study was carried out at Experimental Station at Centre for Advanced Studies in Vaccinology & Biotechnology (CASVAB), University of Balochistan, Quetta. Two hundred and forty (240) male lambs of approximately same age (8-10 months) and weight of five distinct breeds found in Balochistan were included. Animals were divided in to five groups comprising of forty eight lambs of each breed. Animals

were ear tagged and managed under identical conditions. A semi control feeding regime was applied i.e. wheat straw *ad libitum*, Green (Barseem) 3kg/day/head and commercial concentrate ration was offered @ 0.2, 0.3, 0.35, 0.4 and 0.5kg/day/head respectively. Animals were weighed at the start of trial and there after on monthly basis before morning feeding. A delicate weighing scale (± 20) gram was used to check variation. In order to get productive performance of different breeds data revealed was subjected to statistical analysis using Completely Randomized Design (CRD) using computer soft ware MSTATC. Measurements of the length, height and girth (in inches) were also recorded at the end of the trial and correlations were estimated.

Results and Discussion. The results of initial weight, final weight, total weight gain, percent change and daily weight gains given in Table 1. Significantly higher ($P < 0.05$) gain was recorded in Mengali and Balochi (72.31 ± 1.9 and 71.28 ± 2.4) respectively, while the lower was found in Beverigh (51.54 ± 2.25). Munir et al (2008) comparing the impact of intensive and extensive feeding system and found that Balochi sheep under intensive feeding system gained 66.26 g/d/h during early winter months (Oct. to Dec.) provided 1.25 kg feed/day. The higher gain in the present study suggested that Mengali and Balochi breed have the genetic potential that would have exhibited in the present trial. Mahgoub et al (2000) and Macit et al (2001) reported that genotype had a significant influence on the average daily weight gain during the fattening period and also depends upon the availability of green fodder, *ad libitum* wheat straw supplemented with moderate quantity of concentrate. Kochapakdee et al (1994) emphasized the importance of concentrate supplementation in growth and productivity. In present study concentrate ration was provided @ 0.2 to 0.5 kg/day for the period of five months supported by green fodder and wheat straw but researchers in different studies describe the *ad libitum* fattening system of lambs as the best method, especially for meat production (Yacoub & Kashmoula 1988; Momani et al 1997). The expenditure associated with feeding and profit is very marginal and also depends on the employed production system (Charray et al 1992) and optimum growth can be obtained with appropriate combination of concentrate and forage in the lamb's diet (Mahajan et al 1976). Therefore, the strategy for production should be, to optimize the efficiency of utilization with the available feed resources and cutting the feeding cost, and thereby attempt to maximize animal production and profitability.

Table 1

Weight Gain of Different Sheep Breeds in Kg (Mean \pm SEM)

Breed	Initial weight	Final Weight	Total Gain	% Change	Average Daily Gain (gm)
Balochi	22.15 ± 0.76	32.85 ± 1.02	10.69 ± 0.29	48.58 ± 1.53	71.28 ^a ± 2.4
Rakhshani	22.92 ± 1.19	31.50 ± 1.23	8.58 ± 0.43	38.02 ± 2.29	57.22 ^b ± 1.02
Harnai	22.17 ± 0.96	31.00 ± 0.99	8.83 ± 0.30	40.64 ± 1.88	58.89 ^b ± 1.25
Beverigh	19.5 ± 0.75	27.23 ± 0.87	7.73 ± 0.29	40.24 ± 2.1	51.54 ^c ± 2.25
Mengali	22.75 ± 1.47	33.50 ± 1.9	10.85 ± 1.03	48.01 ± 1.35	72.31 ^a ± 1.9

^{abc}Means followed by different letter in the column are significantly different ($p < 0.05$); 1 kilogram = 2.204622 pounds.

The Biometric parameters of Height, Length and Girth of breeds in present study (Table 2) revealed significant difference ($P < 0.05$) showing extends of variability. The girth of Mengali and Balochi is highest than the other three breeds ($P < 0.05$) while no significant difference was observed in rest of breeds ($P > 0.05$).

Table 2

Biometric Traits of Different Sheep Breeds
(Mean \pm SEM of Height, Length and Girth in Inches)

<i>Breed</i>	<i>Height</i>	<i>Length</i>	<i>Girth</i>
Balochi	24.85 ^b ± 0.260	36.38 ^a ± 0.640	33.15 ^a ± 0.720
Rakhshani	20.83 ^d ± 0.390	27.50 ^c ± 0.940	29.16 ^b ± 1.060
Harnai	25.67 ^a ± 0.280	35.41 ^a ± 0.670	29.25 ^b ± 0.750
Beverigh	22.53 ^c ± 0.260	31.53 ^b ± 0.640	30.00 ^b ± 0.720
Mengali	26.05 ^a ± 0.230	36.68 ^a ± 0.690	33.55 ^a ± 0.720

^{abc}Means followed by different letter in the column are significantly different ($p < 0.05$); SE= Standard Error; 1 Inch = 24.4 mm.

The results of Biometric correlation estimates among the traits in five breeds of sheep of present study were found highest between W*G (0.978 \pm 0.051) in Mengali and lowest were between W*L traits (-0.061 \pm 0.091) in Rakhshani. Commonly girth is used to estimate the weight of the sheep (Jones & Forbes 1982). It has observed that all traits were positive except W*L (-0.061 \pm 0.091) and L*H (-0.447 \pm 0.333) traits in Rakhshani. The highest correlation estimates between W*H traits were found (0.893 \pm 0.030) in Rakhshani and lowest (0.034 \pm 0.072) in Harnai. Estimates of correlations between all traits of Mengali and Balochi were moderate to high and consistent as compare to other breeds (Table 3). Biometry findings are supported by Acharya (1982) and Meheta et al (1995) the variation in biometry, productive, reproductive performance and survival of Juliann and Malpura, and Sonadi sheep of India were due to genetic potential of breeds as well as adoptability to environment.

Table 3

Biometric Correlations Estimates Between Traits (Mean \pm SEM), Weight (W), Height (H), Girth (G) and Length (L) of Different Sheep Breeds

<i>Breed</i>	<i>Correlation</i>					
	W*L	W*H	W*G	L*H	L*G	H*G
Balochi	0.510 ± 0.264	0.450 ± 0.05	0.629 ± 0.197	0.511 ± 0.480	0.800 ± 0.149	0.405 ± 1.273
Rakhshani	-0.061 ± 0.091	0.893 ± 0.030	0.973 ± 0.051	-0.447 ± 0.333	0.137 ± 1.202	0.799 ± 1.202
Harnai	0.761 ± 0.093	0.034 ± 0.072	0.898 ± 0.104	0.124 ± 0.156	0.675 ± 0.382	0.000 ± 1.041
Beverigh	0.186 ± 0.113	0.866 ± 0.067	0.517 ± 0.207	0.411 ± 0.319	0.000 ± 0.633	0.238 ± 0.530
Mengali	0.774 ± 0.093	0.890 ± 0.067	0.978 ± 0.051	0.505 ± 0.480	0.810 ± 0.149	0.685 ± 1.202

Conclusions. It is a fact that extensive production is economically viable than semi-intensive system. Therefore it is necessary to develop a strategy for production, to optimize the efficiency of utilization of available feed resources and limiting the feeding cost, and thereby attempt to maximize sheep production. Variations in productive and biometric performance are may be, due to genetic potential of breeds and environmental factors. However, further investigations to be carried out to establish more precisely the maximum growth performance of the different breeds prevailing in the Balochistan province for profitable farming.

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