



Survey and Performance Evaluation of Malpura Sheep in Farmers' Flocks of its Native Tract

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ABSTRACT

Data on growth, wool and milk yield of Malpura sheep maintained under farmers' flocks in its native tract were recorded and analyzed. In breeding tract of Malpura sheep, more than 80 percent farmer's family members were found illiterate. The average weight of adult rams was 49.17 ± 0.53 kg and of the lactating ewes was 34.36 ± 0.18 kg. Location significantly affected body height in the all age groups, while for other traits an erratic trend was noticed. The least squares means of body weight at weaning and hoggets stage were 13.09 ± 0.15 and 22.55 ± 0.34 kg, respectively. The wool yield of animal was higher ($P<0.01$) in March clip (755 g) followed by that in September – October (481 g) and was lowest in July (444 g). The week of lactation significantly affected ($P<0.01$) daily milk yield and maximum milk yield was in 4th week of lactation. The overall performance of Malpura in farmers' flock was found satisfactory under prevailing harsh climatic conditions of semi-arid tropics.

Keywords: Malpura, sheep, growth, wool yield, farmers flock.

Malpura is one of the important and well-recognized mutton sheep of India. It produces quality meat in addition to coarse wool of about one kg annually. Ewes of this breed have good mothering ability and produce sufficient milk to sustain and accelerate the growth of their neonates (Mishra *et al.*, 2005). This breed was given emphasis by Indian Council of Agricultural Research, New Delhi while launching All India Coordinated Research Project on sheep for mutton production in 1970's by including Malpura as dam breed for evolving Mutton Synthetics. At Central Sheep and Wool Research Institute, Avikanagar, this breed has been found useful as dam breed in introducing the resistance against semi-arid tropic stresses in the evolved strain of sheep such as Avikalin, Bharat Merino and Avimaans. Reports available (Arora *et al.*, 1975c, Acharya, 1982, Mishra *et*



al., 2005) regarding performance of this breed were mostly based primarily on the information recorded under organized farm conditions. The information on production potential of Malpura sheep under field conditions is scanty. Hence an attempt was made to collect information on growth parameters, wool production and milk production in its native tract.

MATERIAL AND METHODS

The reported study was conducted on 17 and 16 randomly selected villages of Tonk and Jaipur districts, respectively (Report, 2004). The numbers of flocks covered are detailed in Table 1.

Table 1: Sheep flocks covered

District	Tehsil	No. of flocks/ farmers	No. of villages
Tonk	Malpura	64	07
	Niwai	59	10
	Chaksu	20	06
Jaipur	Phagi	50	05
	Sanganer	37	05
Total		230	33

Management Practices followed

Most of the farmers of Malpura tehsil (Distt.Tonk) manage their flocks by grazing with little supplementation. In village Diggi most of the flocks are migratory. In village Pindni ki Dhani, all flocks are stationary but breeders provide supplementary feeding to all the animals. In Niwai tehsil (Tonk), almost all flocks are stationary and flocks graze near the villages. Flocks move up to a distance of about 10 km daily. About 80% farmers give supplementary feed i.e. concentrate to rams/lambs and about 20% graziers supplement with tree lopping. In Phagi tehsil (Jaipur), about 80% farmers go for migration almost every year up to a distance of 40 to 100 km. Almost all the breeders give supplementary feed to lambs/rams. In Chaksu tehsil (Jaipur), almost all flocks are stationary and the flocks graze near villages in common grazing land and cover up to 10 km distance everyday. Breeders give supplementary feed to few animals. All the breeders of Chaksu tehsil are adopting similar management practices with their flocks. In Tehsil Sanganer (Jaipur) all flocks are stationary and farmers give supplementary feed to selected animals. These flocks go up to 10-12 Km for grazing. Grazing was done mainly on natural grasses and roadside grazing with tree lopping is the common practice. During lean periods (April–June) extensive tree lopping was common practice. For adult animals housing is mostly open type. However, lambs are kept under covered housing of thatched material for protection against inclement weather.

Supplementary feeding with green fodder and concentrate were provided (during critical periods) to lactating ewes, breeding rams during breeding season and young lambs. Farmers usually follow vaccination for Enterotoxaemia (ET) and Sheep Pox. Around 50-70% of the farmers were observed practicing E.T. vaccination regularly, 40-50% practicing Sheep Pox vaccination while all the farmers drench their animals with different anthelmintics (2-4 times/year).

Data Collection and Analysis

The data were collected on body weights at different stages, body measurements, wool yield and milk yield for NATP Project “Genetic Characterization and Conservation of Important Sheep and Goat Breeds of Arid Zone, Sub-Project Genetic Characterization and Conservation of Malpura and Jaisalmeri Sheep”, by personal interview method. The least-squares procedure (Harvey, 1990) was used to analyze the data.

RESULTS AND DISCUSSION

Habitat and Distribution

Malpura sheep is found mainly in Tonk and Jaipur districts of Rajasthan. The home tract of the breed is located at latitude of 27°17' N, longitude 75°22' and an altitude of 320 m above mean sea level in the semi-arid tract of the country, where the rainfall is erratic and mainly concentrates during July to August. The precipitation ranges from 400 to 700 mm per annum. The mean monthly maximum and minimum temperatures ranged from 23.5 to 41.2°C and from 9.2 to 31.5°C, respectively. The maximum temperature during summer shoots up to 48°C. Relative humidity starts rising in the late part of June or early July. The area is exposed to hot-dry winds from April to June with lot of dust in the atmosphere. The area has considerable diversity in its soil land use pattern and cropping system. Major crops sown are Bajra, Sorghum, Maize, Wheat, Barley and Groundnut. The soil types are: sandy, sandy-loam, saline low lying and black clay rocky soil. Vegetation in the area comprising mainly of tall bushes, some trees and seasonal shrubs and forbs. Common grazing land is degraded and depleting. The agricultural production is very low due to chronic scarcity of water resources. The agrarian economy mostly depends on the livestock rearing and sheep/goat form a major component.

Economic Status and Literacy

Economic status of the farmers involved in the Malpura sheep rearing was surveyed and percentages of farmers in each district according to income range are presented in Table 2. It became evident from the table that almost 72% of the

**Table 2:** Economic Status of Sheep Breeders surveyed

Annual Income range	Districts and number of breeders			
	Tonk (123)		Jaipur (107)	
No.	%	No.	%	
≤ Rs.10, 000	28	22.76	35	32.71
10,000 to 20,000	47	38.21	30	28.03
20,000 to 30,000	25	20.32	22	20.56
30,000 to 40,000	14	11.38	06	5.60
40,000 to 50,000	04	3.25	04	3.73
> 50,000	05	4.06	10	9.34

Figures within parentheses are number of observations.

farmers were earning less than ₹ 30, 000 per year. 22.76 % and 32.71 % of sheep breeders of Tonk and Jaipur district respectively had annual income of less than ₹ 10,000/- and lived Below Poverty Line (BPL) income range (this is based on assumption that any family earning less than annual income of ₹ 10,000/- falls in BPL category). Few farmers had an annual income more than ₹ 50,000/-. Most of the lands available were rain fed and farmers in this area are mainly involved in sheep rearing as a source of income. The average family size and literacy status are presented in the Table 3. More than 80 percent of the farmers' family members were illiterate. The results are in accordance with report of Kushwaha *et al.*, (1999). Only 18.42 and 12.16% of family members were found literate in Tonk and Jaipur district, respectively.

Table 3: Literacy status of the sheep breeders

Particulars	No. of breeders	
	Tonk (123)	Jaipur (107)
Average family size	10.3	13.75
Illiterate %	81.58	87.84
Literate %	18.42	12.16
Primary standard %	41.03	35.75
Secondary and above %	58.97	64.24

Figures within parentheses are number of observations.

Body Measurements

Body measurements of lambs, hoggets, milking ewes, dry ewes and adult rams of Malpura sheep are presented in Table 4. Averages for body measurements such as body length, height at withers and chest girth in adult males were 73.8, 76.4 and 86.2 cm and in adult females the corresponding figures were 66.8, 69.3 and 76.3

Table 4: Least squares mean of body measurements of Malpura sheep

		Body length	Body height	Heart Girth	Paunch Girth	Eye length	Ear Length	Number
Lambs (approx 3 Month)	Overall	44.77±0.34	50.36±0.32	53.26±0.35	56.36±0.39	10.08±0.77	6.91±0.12	520
	Location	NS	*	NS	NS	**	**	
	Tonk	45.22±0.40	50.82±0.38	52.37±0.41	55.95±0.46	12.33±0.92	6.64±0.14	313
	Jaipur	44.32±0.49	49.89±0.46	54.14±0.51	56.77±0.56	7.84±1.13	7.17±0.17	207
	Sex	**	**	**	**	**	**	
	Male	42.82±0.58	48.78±0.54	51.33±0.59	54.15±0.66	8.11±1.32	6.26±0.20	134
	Female	46.73±0.34	51.94±0.32	55.19±0.35	58.57±0.39	12.05±0.78	7.56±0.12	386
	Overall	58.51±0.63	63.34±0.69	68.25±0.75	72.34±0.74	10.06±0.12	8.58±0.21	513
	Location	**	**	NS	NS	**	*	
	Tonk	60.91±0.71	65.17±0.78	68.06±0.84	72.82±0.83	9.81±0.14	8.36±0.24	203
Hoggets (approx 6 Month)	Jaipur	156.12±0.68	61.50±0.75	68.45±0.82	71.85±0.79	10.30±0.13	8.81±0.23	310
	Sex	NS	NS	NS	NS	*	NS	
	Male	58.06±1.21	62.52±1.34	67.49±1.46	71.61±4.43	10.32±0.24	8.73±0.41	29
	Female	58.97±0.31	64.15±0.17	69.02±0.37	73.08±0.36	9.79±0.06	8.43±0.10	484

Contd.



		Milking Ewes		Dry Ewes		Adult Ram	
Overall	Location	66.76±0.21	69.34±0.17	76.34±0.20	81.89±0.25	10.70±0.05	8.52±0.09
		NS	*	**	**	*	*
Milking Ewes	Tonk	67.07±0.31	69.73±0.25	73.98±0.31	81.00±0.38	10.42±0.07	8.19±0.15
	Jaipur	66.46±0.27	68.95±0.22	78.71±0.26	82.78±0.33	10.98±0.06	8.85±0.13
Overall	Location	68.29±0.14	71.26±0.12	79.30±0.14	85.67±0.16	11.06±0.03	8.94±0.06
		**	**	**	**	*	*
Dry Ewes	Tonk	70.30±0.21	73.07±0.18	78.56±0.21	86.08±0.24	11.18±0.05	9.06±0.08
	Jaipur	66.28±0.19	69.45±0.15	80.04±0.18	85.26±0.21	10.93±0.04	8.82±0.07
Overall	Location	73.74±0.35	76.3 ± 0.33	86.18±0.54	92.59±0.42	12.14±0.08	9.12±0.17
		NS	**	NS	NS	NS	*
Adult Ram	Tonk	74.36±0.47	77.34±0.44	86.09±0.72	93.18±0.56	12.19±0.10	9.45±0.23
	Jaipur	73.12±0.47	75.35±0.48	86.26±0.79	92.01±0.62	12.09±0.11	8.79±0.26

NS: Non-significant, * $P<0.05$, ** $P<0.01$.

cm, respectively. As expected, adult males had higher standard for these parameters compared to females. Mishra *et al.*, (2005) reported slightly higher estimates for body conformation traits of Malpura sheep under organized farm conditions. Location (district) significantly affected body height in all the age group, while for other traits an erratic trend was noticed. Almost all flocks of Malpura breed are stationary and they graze in nearby villages on common grazing land and cover up to 10 km distance every day.

Body weight

The least squares mean of body weights at different ages in Malpura are presented in Table 5. The least square means of body weight at weaning, hogget's, milking ewes, dry ewes and adult rams were 13.09 ± 0.15 , 22.55 ± 0.34 , 34.36 ± 0.18 , 37.45 ± 0.14 and 49.17 ± 0.53 , respectively. Location significantly affected all the body weights except of adult rams. The body weights of Malpura at various ages in present study were falling within the range reported by earlier workers (Kaushish *et al.*, 1990, Kumar *et al.*, 2003, Sharma *et al.*, 2003, Mishra *et al.*, 2005). Significant effect of sex on 3 and 6-month weight was also reported by Singh *et al.*, (1984), Sharma *et al.*, (2003) and on 9-month by Kaushish *et al.*, (1990) and Sharma *et al.*, (2003).

Table 5: Least squares mean of body weight of Malpura sheep

Particulars	Body weight at				
	Lambs (-3 month)	Hoggets (-6 month)	Milking Ewes	Dry Ewes	Adult Ram
Overall	13.09 ± 0.15 (520)	22.55 ± 0.34 (513)	34.36 ± 0.18 (644)	37.45 ± 0.14 (1341)	49.17 ± 0.53 (201)
Location	*	**	**	**	NS
Tonk	13.33 ± 0.17 (313)	23.32 ± 0.38 (203)	33.91 ± 0.27 9273)	38.30 ± 0.21 (591)	49.52 ± 0.78 (110)
Jaipur	12.84 ± 0.21 (207)	21.78 ± 0.37 (310)	34.86 ± 0.23 (371)	36.59 ± 0.18 (750)	48.83 ± 0.71 (91)
Sex	**	**	-	-	-
Male	12.28 ± 0.25 (134)	21.54 ± 0.66 (29)	-	-	-
Female	13.89 ± 0.15 (386)	23.56 ± 0.17 (484)	-	-	-

Within parentheses are number of observations.

Greasy fleece yield

Shearing data were collected from 2602 Malpura sheep. The least squares mean of Greasy Fleece Yield (GFY) are depicted in Table 6. Spring season shearing



produced more greasy fleece yield than autumn season. Generally in the native area farmers sheared the animals three times a year. The overall mean of GFY for Malpura is 561 g. Males produced heavier clip yield than females. This could be attributed to the fact that only few selected males are kept in the flock whereas culling in adult females is very low. The wool yield of March clip (757 g) was higher ($P<0.01$) than that in September-October (481 g) and was lowest in July (444 g). Such changes in fleece yield could also be ascribed to seasonality of biomass availability in region. In March clip, the sheep had earlier passed through adequacy of quality forages and comfortable ambient conditions and the September-October clip was harvested after lush season, June clip represented the yield of lean season (Kaushish *et al.*, 1994). The present study is in close agreement of findings reported by Arora *et al.*, (1999) and Sharma *et al.*, (2003). Wool samples were also collected for analysis of physical attributes viz. fibre diameter, Medullation percentage and staple length and the results are presented in table. Average staple length, fibre diameter and Medullation percentage for Malpura were 4.47 cm, 46.66 μ and 59.96, respectively. The average for staple length, fibre diameter and Medullation percentage were higher than those in Chokla and Nali (Arora *et al.*, 1975a, b, Kushwaha *et al.*, 1999), thus showing that Malpura produces much coarse carpet type fleece. The present study is in close agreement of findings of Arora *et al.*, (1975c).

Table 6: Greasy fleece yield (gm.) of adult Malpura sheep

Particulars	LSM \pm SE	No.
Overall	561 \pm 7	2602
Location	**	
Tonk	508 \pm 11	410
Jaipur	614 \pm 6	2192
Sex	**	
Male	674 \pm 12	127
Female	447 \pm 4	2475
Season	**	
Spring (march)	757 \pm 14 ^a	548
Autumn-1 (July)	444 \pm 8 ^c	606
Autumn-2 (Sept-Oct)	481 \pm 7 ^b	1448
Clips/year	**	
Two	580 \pm 8	801
Three	540 \pm 11	1801

Milk yield

Data were collected regarding the milk yield from week 1 to week 7 after lambing. Malpura ewes are good milkers and the average weekly milk yield of Malpura was

313.54 g for first week, 408.04g for fifth week and 296.46g for seventh week. The week of lactation had significant effect ($P<0.01$) on daily milk yield. Maximum milk yield was in fifth week of lactation. The significant effect of week of lactation on milk yield was also reported by Singh (1997) and Narula *et al* (1999). Sharma and Goel (1978) noted maximum milk yield in third week of lactation. However, Mahajan and Singh (1976) reported maximum milk yield in second week of lactation.

Study indicated that performance of Malpura sheep is satisfactory under prevailing harsh climatic conditions of semi-arid region. There is a need to establish the ram rearing centers of Malpura breed to meet out the demand of farmers and to avoid the intermixing of the breeds. This will ensure the *in-situ* conservation of Malpura breed in its native tract.

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