Research Article

Study on Breeding Practices of Sheep by Sheep Rearers Inarid and Semiarid Region of Rajasthan

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Abstract | The data were collected from 120 sheep rearers selected from 8 villages of two Tehsil of Bikaner district. The information was collected from respondents on breeding practices of sheep by an interview schedule. The maximum at 73.33% respondents detected heat. Age at first mating of sheep was recorded highest (69.16%) for 12-18 months age%. About 74.17% respondents possess own breeding ram while 78.33% were using breeding ram from own flock. Estrus during rainy season was observed by 56.67% respondents. Overall 27.50% of respondents of surveyed population were not aware about castration of male lamb. The physical appearance /breed characteristic were used as a common criterion for selecting the breeding ram by 77.50% while, only 22.50% respondents used body weight/health for selecting breeding ram. Treatment of anoestrus was not common in different flock size respondents whereas, 4.17% were well aware to provide anoestrus treatment. The overall results depicted that breeding ram, selection of breeding ram and veterinary aid during lambing practices were significantly ($p < 0.05$) associated with flock size, whereas, remaining practices pertaining to breeding in the experimental area were non-significant ($p > 0.05$) with the flock size.

INTRODUCTION

Sheep is a major occupation of majority of farmers in the arid and semi arid region of India and has become an integral part of their livelihood. It is a movable asset for the resource poor farmer in terms of economics returns and also for liquidity in time of crisis. The multipurpose role of sheep as source of income, meat, skin, manure and coarse wool or long hairy fleece, means of risk avoidance during crop failure and the cultural function during festivals are well documented (Kosgey et al., 2008). Despite low level of productivity due to several technical (genotype, feeding and animal health), institutional, environmental and infrastructural constraints (Tibbo, 2006) indigenous sheep breeds have great potential to contribute more to the livelihood of people in low-input, smallholder crop livestock and pastoral production systems (Kosgey and Okeyo, 2007).

Small ruminants are now gaining much more importance as compared to large ruminant as they are mainly dependent on grazing for their survival. Sheep productivity is influenced by breed, dietary factors (Ram Ratan, 2004) and rearing environment (Karim et al.,1984). In the economics of sheep husbandry, wool is now of secondary importance because mutton fetches maximum return to a sheep farmer (Mehta et al., 1995). Thus, this study was aimed to assess sheep breeding practices of sheep farmers in arid and semi arid region of Rajasthan.

MATERIALS AND METHODS

The study was conducted in Bikaner district of Rajasthan. The data were collected from 120 sheep rearers selected

from 8 villages of two Tehsil of Bikaner District. Total 120 sheep rearers were categorized in to three categories on the basis of flock size viz. Small holding (1-20 sheep), Medium holding (21-40 sheep) andLarge holding (Above 40 sheep). The information was collected on various breeding practices adopted by sheep rearers through an interview schedule.

STATISTICAL ANALYSIS OF DATA

Data was computed and analyzed statistically according to methods of Snedecor and Cochran, (1994).

RESULTS AND DISCUSSION

BREEDING PRACTICES

The analysis of data pertaining to heat detection by respondents has been shown in Table 1. The overall 73.33% respondents detected heat while, 26.67% did not detect heat. Tehsil wise data indicated that maximum at 78.33% respondents of Lunkarnsar tehsil were aware about heat detection followed by Bikaner (68.33%).

Table 1: Heat detection by respondents

Particulars		Tehsil		Overall
		Bikaner	Lunkarnsar	
Yes.	No. of respondents	41 (68.33)	47 (78.33)	88 (73.33)
No.	No. of respondents	19 (31.67)	13 (21.67)	32 (26.67)
Overall	No. of respondents	60 (100)	60 (100)	120 (100)

Note: Figures in parenthesis indicate tehsil wise %age.

Table 2: Age at first matting of sheep under study area

Age groups (Months)		Tehsil		Overall
		Bikaner	Lunkarnsar	
<12	No. of respondents	6 (10.00)	2 (3.33)	8 (6.67)
12-18	No. of respondents	39 (65.00)	44 (73.33)	83 (69.16)
> 18	No. of respondents	15 (25.00)	14 (23.33)	29 (24.17)
Overall	No. of respondents	60 (100.00)	60 (100.00)	120 (100.00)

Note: Figures in parenthesis indicate tehsil wise %age.

All the sheep rearers adopted natural service by the ram of their own flock ram or outside and artificial insemination was not practiced in the study area due to lack of trained person and non-availability of ram semen in areas. These findings are in agreement with the findings of Tanwer (1994), Nitharwal (1999), Rao (2002), Gokhale et al. (2002), Rai and Singh (2004), Sharma (2005) and Gurjar (2005).

The data in Table 2 showed that 69.16% of sheep had age at first mating between 12-18 months followed by 24.17% above 18 months while only 6.67% had first matting age below 12 months in the surveyed area.

BREEDING RAM

The effect of flock size on different breeding practices adopted by sheep rearers of study area are presented in Table 3. The results indicated highly significant (P<0.01) effect of flock size on breeding ram kept by sheep rearers (χ^2=13.13). Majority of sheep rearers (74.17%) used own breeding ram for mating whereas, 25.83% sheep rearers did not possess their own ram for breeding. The proportion of sheep rearers having own breeding ram was higher among sheep rearers of large flock size (54.07%) as compared to medium (29.63%) and small (24.72%) flock size. These observations are contradictory with the results of Gurjar (2005) and Sharma (2005).

The results indicated that keeping of own breeding ram in the flock increased with the increase in sheep flock size. The use of breeding ram other than their own ram in flock decreased with increase in the flock size. The maximum use of other ram was observed for small flock size.

The results also indicate in Table 4 that sheep rearers at 49.16% of study area used their breeding ram for >40 breedable females followed by 34.17% sheep keepers used their breeding ram for 30- 40 breedable females and only 16.67% of sheep keepers used their breeding sheep for less than 30 breedable sheep.

The data in Table 5 showed that maximum at 65.83% sheep rearers used a breeding ram for more than 3 years while, at 7.50% sheep rearers used a breeding ram for a period of 1-2 year. The sheep keepers at maximum at 68.00% in Bikaner tehsil used breeding ram for more than 3 year while, in Lunkarnsar 66.67% sheep keepers used breeding ram for more than 3 year.

SELECTION OF BREEDING RAM

As shown in Table 3 the selection of breeding ram was significantly (P<0.05) affected by the flock size (χ^2=5.99). Information pertaining to selection of breeding ram shows that maximum sheep rearers (78.33%) in the study area practiced selecting breeding ram from own flock. The proportion of sheep rearers who practiced selecting the breeding ram from outside decreased with increase in flock size whereas, the proportion of sheep rearers who select breeding ram from their own flock increased with increase in flock size. The sheep rearers among small flock size selected maximum at 32.50% breeding ram from outside, while among the sheep keepers who select breeding ram from o-

Table 3: Breeding practices of respondents across flock size

Practices	House holds(Flock size)			Overall	χ^2 Value
	Small (1-20)	**Medium (21-40)**	**Large (> 40)**		
1. Breeding ram					
a. Own	22(24.72)# (55.00) *	31(29.63) (77.50)	36(54.07) (90.00)	89 (74.17)	13.13**
b. Other	18 (43.55) (45.00)	9 (35.55) (22.50)	4 (20.89) (10.00)	31 (25.83)	
2. Selection of breeding ram					
a. Own flock	27 (28.72) (67.50)	31(32.98) (77.50)	36(38.30) (90.00)	94 (78.33)	5.99*
b. Out side	13 (41.01) (32.50)	9 (33.59) (22.50)	4 (25.39) (10.00)	26 (21.67)	
3. Breeding season					
a. Summer	5(55.56) (12.50)	2(22.22) (5.00)	2 (22.22) (5.00)	9 (7.50)	3.12
b. Rainy	22(32.35) (55.00)	21(30.88) (65.00)	25(36.76) (62.50)	68 (56.67)	
c. Winter	13(30.23) (32.50)	17(39.53) (42.50)	13(43.33) (32.50)	43 (35.83)	
4. Pregnancy confirmation					
a. Non return in heat	2 (40.00) (5.00)	3 (60.00) (7.50)	0 (0) (0)	5 (4.17)	2.92
b.Enlargement of abdomen	38 (33.04) (95.00)	37(33.17) (92.50)	40(34.78) (100)	115 (95.83)	
5. Management of pregnant ewe					
(i) Housing					
a. Separate	2 (66.67) (5.00)	1 (33.33) (2.50)	0 (0) (1.67)	3 (2.50)	2.05
b. Group	38 (32.48) (95)	39(33.33) (97.50)	40(34.19) (100)	117 (97.50)	
(ii) Grazing					
a. Not allowed	1 (100) (2.50)	0 (0) (0)	0 (0) (0)	1 (0.83)	2.01
b. Allowed	39 (32.77) (97.50)	40(33.61) (100)	40(33.63) (100)	119 (99.17)	
(iii) Prepartum ration					
a. Yes	3 (75.00) (7.50)	1 (25.00) (2.50)	0 (0) (0)	4 (3.33)	2.01
b. No	37 (31.90) (92.50)	39(33.62) (97.50)	40(34.48) (100)	116 (96.67)	
(iv) Veterinary aid during lambing					
a. Required	5 (83.33) (12.50)	1 (16.67) (2.50)	0 (0) (0)	6 (5.00)	7.32*
b. Not required	35 (30.70) (87.50)	39(34.21) (97.50)	40(35.09) (100)	114 (95.00)	
6. Castration					
a. Yes	32 (36.78) (80.00)	30(34.48) (75.00)	25(28.73) (62.50)	87 (72.50)	3.2

	Bikaner	Lunkarnsar			
b. No	8 (24.24) (20.00)	10(30.30) (25.00)	15(45.45) (37.50)	33 (27.50)	
7. Selection criteria of breeding ram					
a. Body weight/Health	9 (33.33) (22.50)	13(48.14) (32.50)	5 (18.52) (12.50)	27 (22.50)	4.58
b. Physical appearance/ breed characteristics	31 (33.33) (77.50)	27(29.03) (67.50)	35(37.63) (87.50)	93 (77.50)	
8. Treatment of anoestrus					
a. Yes	3 (60.00) (7.50)	1 (20.00) (2.50)	1 (20.00) (2.50)	5 (4.17)	1.66
b. No	37 (32.17) (92.50)	39(33.91) (97.50)	39(33.91) (97.50)	115 (95.83)	
9. Treatment of repeaters					
a. Yes	2 (100) (5.00)	0 (0) (0)	0 (0) (0)	2 (1.67)	4.06
b. No	38 (32.20) (95.00)	40(33.90) (100)	40(33.90) (100)	118 (98.33)	

\# Figure in parenthesis indicate vertical an* horizontal %age.
* Significant (P<0.05), ** significant (P<0.01)

wn flock are maximum at 38.30% were from large flock size. These observations are similar with the results of Rao (2002).

Table 4: Breedable sheep per breeding ram of respondents

Breedable sheep/ram		Tehsil		Overall
		Bikaner	Lunkarnsar	
< 30 sheep	No. of respondents	7 (11.67)	13 (21.67)	20 (16.67)
30-40 sheep	No. of respondents	22 (36.67)	19 (31.67)	41 (34.17)
> 40 sheep	No. of respondents	31 (51.66)	28 (46.66)	59 (49.16)
Overall	No. of respondents	60	60	120
		(100.00)	(100.00)	(100.00)

Note: Figures in parenthesis indicate tehsil wise %age.

BREEDING SEASON

As shown in Table 3 results obtained indicates that maximum at 56.67% sheep rearers observed their sheep in heat during rainy or with the onset of monsoon while, only 7.50% sheep rearers observed their sheep in heat during summer season. The results obtained indicated that effect of sheep flock size was not associated with breeding season (χ^2=3.12). Large flock size sheep exhibits heat maximum at 62.50% during rainy season while, sheep under large and medium flock size exhibits heat equally minimum at 5.00% during summer season.

PREGNANCY CONFIRMATION

As shown in Table 3 the effect of flock size on pregnancy confirmation was non-significant (χ^2=2.92). The overall

results show that majority of sheep rearers (95.83%) confirm their sheep pregnancy by enlargement of abdomen followed by non-return of animal in heat (4.17%). Similar observations were reported by Sharma (2005) and Gurjar (2005).

Table 5: Duration of breeding ram used in respondents flock

Age groups		Tehsil		Overall
		Bikaner	Lunkarnsar	
No breeding ram	No. of respondents	7 (11.67)	5 (8.33)	12 (10.00)
1-2 Years	No. of respondents	5 (8.33)	4 (6.67)	9 (7.50)
2-3 Years	No. of respondents	9 (15.00)	11 (18.33)	20 (16.67)
> 3 Years	No. of respondents	39 (68.00)	40 (66.67)	79 (65.83)
Overall	No. of respondents	60 (100.00)	60 (100.00)	120 (100.00)

Note: Figures in parenthesis indicate tehsil wise %age.

MANAGEMENT OF PREGNANT EWE

The effect of flock size on housing of pregnant ewe was also non-significant (χ^2=2.05). Result shows that maximum sheep rearers (97.50%) in the study area practiced housing their pregnant ewe with other sheep in group housing while, only 2.50% sheep rearers were aware to house pregnant ewe in a separate house. Present observations are in the line of Gurjar (2005) and Chaturvedi et al. (2008). The proportions of sheep rearers who housed separate were

maximum at 66.67% among small flock size.

The association between grazing of ewe during pregnancy and sheep flock size was non-significant (+....²=2.01). Only few farmers at 0.83% of survey population have not allowed pregnant ewe to go for grazing while, maximum proportion of sheep rearers at 99.17% allowed ewe for grazing during pregnancy period. The proportions of sheep keepers who take their pregnant ewe for grazing were maximum at 33.61% for both medium and large flock size. Among the sheep rearers who did not allowed their pregnant ewe for grazing were maximum at 2.50% among small flock size. These findings are close agreement with Gurjar (2005) and Chaturvedi et al. (2008).

The effect of flock size on providing prepartum ration to pregnant ewe was non-significant (χ^2=2.01). Survey results indicate that maximum (96.67%) number of sheep rearers of experiment area do not provide any special ration for their pregnant ewe while, only few sheep rearers at 3.33% provide prepartum ration to their pregnant ewe. The result also shows that sheep keepers who provide prepartum ration were maximum (7.50%) among small flock holders while, those who do not provide prepartum ration were maximum (34.48%) of large flock holder Present observations are in the line of Suresh et al. (2008) and Chaturvedi et al. (2008).

The results revealed that overall 95.00% sheep rearers do not require any veterinary aid, while 5.00% sheep rearers required veterinary aid during lambing. The proportion of sheep rearers who required veterinary aid during lambing was maximum in small flock size (83.33%). The association between flock size and veterinary aid during lambing was significant (χ^2=7.32).

CASTRATION

As shown in Table 3 the association between different flock size and castration was non-significant (χ^2=3.2). It was observed that proportion of sheep rearers under small flock size who followed castration was 80.00% which decrease to 75.00% among medium and 62.50% among large flock size sheep rearers. It shows decreasing trend with increased flock size. The overall results irrespective of holding size indicates that 72.50% sheep rearers followed castration, while 27.50 sheep rearers did not followed castration practices for their male lamb. The information pertaining to the age of castration indicates that 62.50% sheep rearers castrate male lamb at the age of above 3 months followed by 10.00% at 1-2 months age. A 27.50 sheep rearers do not castrate their male lamb (Table 6). These observations are similar with the observation of Sharma (2005).

Table 6: Age at castration of male lamb under study area

Age groups		Tehsil		Overall (Months)
		Bikaner	Lunkarnsar	
No	No. of respondents	18	15	33
		(30.00)	(25.00)	(27.50)
1-2 Months	No. of respondents	7	5	12
		(11.67)	(4.17)	(10.00)
> 3 Months	No. of respondents	35	40	75
		(58.33)	(33.33)	(62.50)
Overall (Months)	No. of respondents	60	60	120
		(100.00)	(100.00)	(100.00)

Note: Figures in parenthesis indicate tehsil wise %age.

SELECTION CRITERIA OF BREEDING RAM

Table 3 revealed the physical appearance or breed characteristics as a criterion to select breeding ram was practiced maximum at 77.50%, while only 22.50% sheep rearers used body weight or health as criteria for selection of breeding ram. The proportion of sheep rearers among large flock size who used maximum (87.50) physical appearance/breed characteristic as a criterion for selecting breeding ram. The association among flock size and selection criteria of breeding ram (χ^2=4.58) was non-significant. These observations are similar with the results of Gurjar (2005) and not similar with the results of Sharma (2005).

TREATMENT OF ANOESTRUS

As shown in Table 3 only 7.50% sheep rearers among small flock size provided treatment for anoestrus followed by (2.50%) in both large and medium flock size holders. The effect of flock size on treatment of anoestrus was non-significant (χ^2=1.66). The overall 95.83% sheep rearers did not provide treatment to their sheep for anoestrus. These observations are in agreement with the findings of Krishnamurthy et al. (1992), Tanwer (1994) and Gurjar (2005).

TREATMENT OF REPEATERS

Table 3 revealed only 1.67% sheep rearers of surveyed population were well aware to provide treatment to their repeater ewe. Almost equal number of sheep rearers was recorded among different flock size who did not take any treatment for the sheep. The association between treatment of repeaters and flock size was non-significant (χ^2=4.06). The proportion of sheep rearers who were well aware to provide treatment was maximum at 100% among small flock size.

CONCLUSION

The overall results depicted that breeding ram, selection

of breeding ram and veterinary aid during lambing practices were significantly associated with sheep flock sizein arid and semiarid region of Rajasthan, whereas, remaining practices pertaining to breeding in the experimental area were non-significant with the flock size.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

AUTHORS CONTRIBUTION

Mohan Lal Choudhary: Main author, Vijay Kumar: Major advisor, Subhash Chander Goswami: Advisor Vikramjit Singh. Helped in making Ms and Vijay Kumar: Helped in survey.

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