REPRODUCTIVE PERFORMANCE OF DECCANISHEEP

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Abstract: The overall reproductive performance of 178 Deccani sheep reared in an organized farm was recorded. Estimated least squares means for age at first conception, weight at first conception, age at first lambing and weight at first lambing were 578.78 ± 23.74 days, 24.74 ± 0.50 kg, 728.60 ± 25.11 days and 28.29 ± 0.53 kg, respectively. The effect of season and year of birth were significant on age at first conception, weight at first conception, age at first lambing and weight at first lambing. Hence, it can be concluded that the reproductive traits have tremendous scope of improvement by optimizing the management and plane of nutrition.

Key words: Non-genetic factors, reproductive traits, Deccani sheep.

Introduction

Sheep husbandry plays a key role in India's rural economy reproduction is an important factor in determining the productivity of the ewe. The attainment of age of first conception and subsequently age at first lambing at an early age reduces the generation interval and therefore, are also important factors for the genetic improvement in sheep. Therefore, the present investigation was undertaken to study the factors affecting the reproduction traits of Deccani sheep for making future breeding plan for the improvement of this breed.

Materials and Methods

The data on 178 Deccani ewes maintained at Network Project on Sheep Improvement, Mahatma Phule Krishi Vidyapeeth, Rahuri for the period from 1995 to 1999 were utilized to carry out the present investigation. The ewes were bred throughout the year. The females were detected in oestrous twice daily using aproned rams and mating was allowed by pre-assigned rams to different ewes. Flushing was done 10 to 15 days prior to start of breeding season. During flushing period 150 to 200 g of maize grain soaked in 2 per cent urea water for a period of 10 to 12 hours were offered.

Ewes in last four weeks of pregnancy were separated and provided additional concentrate ration of 150 g per day per head. The ewes before 3-4 days of expected parturition was kept in lambing pen for proper care of dam during parturition as well as newly born lambs. Rambs were kept separately and mostly stall fed to avoid stray mating in the grazing field.

The effect of season and year of birth was statistically studied on age at first conception (AFC), weight of first conception (WFC), age at first lambing (AFL) and weight at first lambing using LSMLMW Computer Programme designed by Harvey (1990). Modified Kramer's (1957) Duncun Multiple Range test was used for comparison of significant sub-class means.

Results and Discussion

The least squares means along with standard errors and analysis of variance exhibiting the effect of factors on reproduction traits are summarized in Table 1 and 2, respectively.

Age at first conception (AFC) :

The overall least squares mean of age at first conception of ewe was 578.78 ± 23.74 days. Off season born lambs attained AFC earlier (511.78 ± 44.26 days) than main season born lambs (645.78 ± 29.94 days). Season of birth of ewe showed

significant (P < 0.01) variations in AFC. The lower AFC in off season born ewes might be a function of body weight gain which was higher in this season. Similar significant seasonal variation has also been reported by Vatalitya (1993) in Patanwadi and its crosses, Dixit *et al.* (2002) in Bharat Merino and Mandakmale*et al.* (2013) in Deccani. However, Mane *et al.* (2014) observed that season of birth had non-significant on AFC in Deccani.

The least squares mean for AFC varied from 693.84 ± 25.53 days in the year 1995 to 488.10 ± 42.06 days in the year 1998 with inconsistent trend over the years. Year of birth found to be a significant (P < 0.01) source of variation for AFC. Ewes lambed in the year 1996 and 1997 as well as 1998 and 1999 were at par to each other for AFC, while all four years 1996 to 1999 showed significantly lower AFC than ewes lambed in 1995. This influence of the year of birth may be attributed to the variations in management and availability of the feed and fodder in different years. Similar, significant yearly variations have been reported by Kharde (1987) in Deccani, Vatalitya (1993) in Patanwadi and its crosses, Dixit *et al.* (2002) in Bharat Merino and Mandakmale*et al.* (2013) in Deccani. However, Mane *et al.* (2014) observed that year of birth had non-significant on AFC in Deccani.

Weight at first conception (WFC):

The overall least-squares mean of WFC was 24.74 ± 0.50 kg. The least squares mean of WFC of main season born ewes was higher (25.94 ± 0.63 kg) than off season born ewes (23.55 ± 0.93 kg).

The analysis of variance revealed that season of birth was a significant (P < 0.05) source of variation in WFC. The WFC was lowest for ewes born in year 1997 (23.22 ± 0.72 kg) and highest for those born in 1995 (25.89 ± 0.54 kg). WFC was found to be significantly (P < 0.01) influenced by the year of birth. Ewes lambed in 1996, 1998 and 1999 as well as year 1997 and 1999 were at par to each other for WFC, while all of them, 1996 to 1999 showed significantly lower WFC than ewes lambed in year 1995. Similar, significant effect of year of

birth on weight at first conception obtained by Vatalitya (1993) in Patanwadi and crosses.

Age at first lambing (AFL) :

The least squares obtained for AFL was 728.60 ± 25.11 days. The off season born ewe lambs attained AFL earlier (661.16 ± 46.81 days) than main season born ewes (796.04 ± 31.67 days). Least-squares analysis of variance suggested significant (P < 0.05) effect of season of birth on AFL. Similar results were recorded by Dixit *et al.* (2002) in Bharat Merino and Mandakmale*et al.* (2013) in Deccani. However, Mane *et al.* (2014) observed that season of birth had non-significant on AFL in Deccani.

The least squares means for AFL varied from 639.23 ± 44.49 days in the year 1998 to 842.38 ± 27.00 days in year 1995 with inconsistent trend over years. Year of birth found to be significant (P < 0.01) variations for AFL. Ewes lambed in the year 1996 and 1997 as well as 1998 and 1999 were at par to each other for AFL, while all four years, 1996 to 1999 showed significantly lower AFL than ewes lambed in year 1995. The influence of the year of birth might be attributed to the variations in management and availability of the feed and fodder in different years. Similar results were reported by Dixit *et al.* (2002) in Bharat Merino, Kharde (1987) and Mandakmale*et al.* (2013) in Deccani. However, Mane *et al.* (2014) observed that year of birth had non-significant on AFL in Deccani.

Weight at first lambing (WFL):

The overall least square means found for WFL was 28.29 ± 0.53 kg. The main season born ewes were heavier (29.89 ± 0.67 kg) than that of ewes born in off season (26.62 ± 0.99 kg).

Season of birth of ewes showed significant (P < 0.01) differences for WFL. Kharde (1987) reported significant effect of season of birth of ewes on WFL, which was in consonance to the present findings.

The least-squares means for WFL varied from 29.35 ± 0.57 in 1995 to 26.52 ± 0.99 kg in the year 1999 with inconsistent trend over the years. The year of birth of ewes had significant (P < 0.05) effect on WFL. The ewes lambed in year 1996, 1997 and 1998, as well as year 1995 and 1998 were at par with

each other for WFL, while all four years 1995 to 1998 showed significantly higher WFL than ewes lambed in 1999. The influence of the year of birth might be attributed to the variations in management practices and availability of the feed and fodder in different years. Similar results were obtained by Kharde (1987) in Deccani.

Conclusions

The least squares means for age at first conception, weight at first conception, age at first lambing and weight at first lambing were 578.78 ± 23.74 days, 24.74 ± 0.50 kg, 728.60 ± 25.11 days and 28.29 ± 0.53 kg, respectively. The effect of season and year of birth were significant on age at first conception, weight at first conception, age at first lambing and weight at first lambing. Effect of season of birth on reproduction traits could be due to changes in managemental and nutritional status. Effect of year of birth on reproduction trials could be attributed to the environmental conditions including variations in managemental practices and grazing resources prevailing in different years.

Hence, it can be concluded that the reproductive traits (viz., AFC, WFC, AFL and WFL) have tremendous scope of improvement by optimizing the management and plane of nutrition.

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Table 1: Least squares means of reproduction traits

Effect	N	Age at first conception (days)		Weight at first conception (kg)		Age at first lambing (days)		Weight at first lambing (kg)	
		Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Overall mean	178	578.78	23.74	24.74	0.50	728.60	25.11	28.26	0.53
Season of birth									
Main season	163	645.78a	29.94	25.94a	0.63	796.04a	31.67	29.89a	0.67
Off season	15	511.78b	44.26	23.55b	0.93	661.16b	46.81	26.62b	0.99
Year of birth									
1995	44	693.84a	25.53	25.89a	0.54	842.38a	27.00	29.35a	0.57
1996	57	592.01b	27.86	25.48b	0.58	742.44b	29.47	28.56b	0.63
1997	39	612.53b	34.19	23.22c	0.72	762.24b	36.17	27.89b	0.77
1998	19	488.10c	42.06	24.95b	0.88	639.23c	44.49	28.97ab	0.95
1999	19	507.41c	44.31	24.17bc	0.93	656.71c	46.87	26.52c	0.99

Similar superscript did not differ significantly from each other

Table 2: Least squares analysis of variance for reproduction traits

Source of variation	d.f.	Reproduction traits			
		Age at first conception MSS	Weight at first conception MSS	Age at first lambing MSS	Weight at first lambing MSS
Season of birth	1	239479.8**	76.50*	188498.7*	142.26**
Year of birth	4	198803.1**	44.59**	177357.6**	30.45*
Error	172	27504.56	12.08	30772.1	13.94

$** = P < 0.01$ and $* = P < 0.05$