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A STUDY ON REPRODUCTIVE PERFORMANCE OF SHEEP IN FIELD FLOCKS OF TAMILNADU

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ABSTRACT

A study was conducted to assess the reproductive performance of sheep in field flocks of Tamil Nadu. Lambing percentage, twinning percentage, weaning percentage, age of ewes at first mating (months) age of rams at first mating (months), age at first lambing (months), weaning age (months) and lambing interval (months) in Southern and North Eastern agro climatic zones in Tamil Nadu were reported to be 97.30 and 97.78, 1.52 and 0.63, 89.57 and 81.32, 12.90 and 13.41, 21.11 and 18.97, 18.19 and 18.97, 3.91 and 5.54, and 10.98 and 11.88 respectively. Overall twinning percentage, weaning percentage, age of males at first mating, weaning period and lambing interval differed significantly between the zones. Peak lambing season in the flocks was reported to be in the month of November in both the zones followed by October and December. However, lambing was present in the flocks throughout the year.

Key Words: *Sheep, Reproductive Performance and Lambing Season*

INTRODUCTION

Tamil Nadu is endowed with eight recognized sheep breeds. Sheep is the main source of meat supply in the state. In the event of failure of seasonal rains leading to crop failure, rearing of sheep gives a helping hand to the farmers. Sheep forms an effective complimentary component in mixed farming. The reproductive performance of sheep has been primarily studied in organized farms mostly institutional and government owned and the results may not reflect the flock productivity under field conditions comprising of village flocks. Hence the present study was aimed to document the reproductive performance traits of sheep in village flocks.

MATERIALS AND METHODS

The study was conducted purposively in the two areas with highest sheep population, the Southern and the Northeastern agro-climatic zones of Tamil Nadu, chosen on the basis of livestock census. Selection of respondents was made by multistage stratified random sampling technique. Reproduction performance of rams and ewes was studied through questionnaire. The information on age at first mating for males and females, age at first lambing, lambing interval and weaning period was collected to the nearest month. Lambing percentage was calculated based on the ewes available in the flock. In addition, twinning percentage and lambing months were also recorded. The data collected were subjected to standard statistical procedures.

RESULTS AND DISCUSSION

The data on reproductive performance of sheep recorded in the study area are presented in table1.

Lambing Percentage

Least squares Mean $\pm$ SE of lambing percentage in the flocks of southern districts ranged from 96.08 ± 0.53 to 97.88 ± 0.32 . Significant ($p < 0.05$) difference was observed between districts. Lambing percentage in the flocks of northeastern zone ranged between 97.14 ± 0.79 to 98.42 ± 0.49 . No difference was observed between districts in this zone. Overall mean lambing percentage in southern zone and northeastern zone were 97.30 ± 0.36 and 97.78 ± 0.56 , respectively. Pair wise comparison of means

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showed no difference between zones. The mean lambing percentage on the basis of ewe available in southern zone ranged between 96.08 ± 0.53 and 98.92 ± 0.25 with the overall mean value of 97.30 ± 0.36 . The corresponding values observed in northeastern zone were from 97.14 ± 0.79 to 98.42 ± 0.49 and 97.78 ± 0.56 . Lambing percentage reported by Acharya (1983), Nagy *et al.*, (1991), Chaarami and Robinson (1992), Jagatheesan (2001), Raman *et al.*, (2003), Dineshkumar *et al.*, (2006) and Kandasamy *et al.*, (2006) were comparable to that observed in the present study. The inter district difference between means of southern zone might be due to the effect of breed, climate and management. In northeastern zone, no differences between means could be observed. This could be attributed to the breed effects as Madras red sheep breed alone was present in the zone.

Twinning Percentage

The overall mean twinning percentage of the flocks in southern and northeastern zone were 1.52 ± 0.26 and 0.63 ± 0.25 respectively, which is higher than that reported by Chaarami and Robinson (1992), Mishra *et al.*, (2004) and Kandasamy *et al.*, (2006) and lower than that reported by Dineshkumar *et al.*, (2006). Inter zonal difference may be due to the breed effect as Jagatheesan (2001) reported that twinning was nil in Mecheri sheep breed of southern zone. But in the present study, in Dindigul district where Mecheri breed of sheep was predominantly seen, the twinning percentage was 3.31 ± 0.45 . It was interesting to note that except in Dindigul district, sheep holders culled the ewes that has lambed twins, which farmers considered as a bad omen. Farmers of Dindigul district regarded that twinning is profitable and retained such ewes in the flock. Detailed studies on the scope of twinning for selection in farmers flock are needed. In the northeastern zone where only Madras red sheep breed is available, the value observed in the present study is higher than that as reported by Raman *et al.*, (2003).

Weaning Percentage

Mean $\pm$ SE weaning percentage of lambs in southern zone among districts ranged from 84.96 ± 1.64 to 93.16 ± 0.59 which differed significantly (Table 33). In northeastern zone, the mean weaning percentage within districts ranged from 78.31 ± 2.04 to 83.08 ± 1.72 with no difference between them. Least square Mean $\pm$ SE of overall weaning percentage of flocks in southern and northeastern zones was 89.57 ± 0.96 and 81.32 ± 1.94 , respectively. Pair wise comparison showed significant difference between the means ($p \leq 0.01$). It was observed that in southern zone weaning percentage between districts ranged from 84.96 ± 1.64 to 93.16 ± 0.59 with overall weaning percentage of 89.57 ± 0.96 and in northeastern zone it ranged from 78.31 ± 2.04 to 83.08 ± 1.72 with overall weaning percentage of 81.32 ± 1.94 . Mothering ability of ewe, external environment, availability of milk in the udder and lamb management might influence the weaning percentage of an individual flock. No literature could be traced for discussion and comparison of this parameter.

Age at First Mating – Female

The mean age at first mating in ewes of southern zone ranged from 11.60 ± 0.18 to 14.25 ± 0.10 months which differed significantly and for the northeastern zone it ranged between 12.05 ± 0.32 and 17.35 ± 0.34 months with significant difference between them. The overall mean age at first mating for ewes in southern and northeastern zones was 12.90 ± 0.49 and 13.41 ± 0.32 months, respectively. Pair wise comparison of means did not show any significant difference. The overall mean age at first mating for ewe in southern and northeastern zone was 12.90 ± 0.49 and 13.41 ± 0.32 months respectively (Table 33). Age at first mating in ewes reported by earlier workers in different breeds ranged between 10 to 24 months (Ganesakale and Rathnasabapathy, 1973; Metha *et al.*, 1995; Chandran, 1998; Kushwaha *et al.*, 1999; Jagatheesan, 2001; Mishra *et al.*, 2004; Dineshkumar *et al.*, 2006 and Kandasamy *et al.*, 2006). Breed and nutritional status of the animal might be the reason for the differences in age at first mating in ewes.

Age at First Mating – Male

The mean age at first mating for rams in southern zone among districts studied ranged between 19.60 ± 0.65 and 23.10 ± 0.34 months and the difference between the means were significant ($p \leq 0.05$). In

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northeastern zone ranged from 17.93 ± 0.44 to 20.10 ± 0.79 months and difference was observed between the months. The overall mean age at first mating for rams in southern and northeastern zones was 21.11 ± 0.58 and 18.97 ± 0.89 months, respectively. Pair wise comparison of means showed significant difference ($p \leq 0.01$). The overall mean age at first mating in rams in southern zone and northeastern zone was 21.11 ± 0.58 and 18.97 ± 0.89 months respectively. The age at first mating in rams reported by earlier workers ranged from 10 months to 24 months in different breeds (Kushwaha *et al.*, 1994; Metha *et al.*, 1995; Chandran, 1998; Jagatheesan, 2001; Dixit *et al.*, 2005; Dineshkumar *et al.*, 2006 and Kandasamy *et al.*, 2006). Breed, nutritional status and social order of the individual animal in the flock might influence the age at first mating.

Age at First Lambing

The mean age at first lambing in southern districts ranged from 16.83 ± 0.21 to 19.67 ± 0.44 months with significant difference between them. In northeastern zone the mean age at first lambing ranged from 17.05 ± 0.22 to 21.43 ± 0.42 months among districts with significant difference between them. Overall mean age in months at first lambing in southern and northeastern zones were 18.19 ± 0.39 and 18.97 ± 0.89 , respectively. Pair wise mean showed no significant difference between them. The overall mean age at first lambing in southern and northeastern zone ranged from 18.19 ± 0.39 to 18.97 ± 0.89 months, respectively, which are comparable to the findings of Chandran (1998), Sushilkumar *et al.*, (2003) and Dineshkumar *et al.*, (2006). Whereas Mishra *et al.*, (2004) and Kandasamy *et al.*, (2006) reported a lower value and Jagatheesan (2001) reported a higher value of age at first lambing. Age at first mating influence age at first lambing in ewes.

Weaning Period

In southern zone, the mean weaning period of lambs among the districts ranged between 2.10 ± 0.31 and 4.84 ± 0.14 months with significant differences in district wise comparison. In northeastern zone it ranged between 5.51 ± 0.24 and 5.58 ± 0.14 months among the districts. No differences between lambing interval and districts were observed. The pooled mean weaning period for southern and northeastern zones were 3.91 ± 0.16 and 5.54 ± 0.19 months respectively. Pair wise comparison of means showed highly significant difference ($p \leq 0.01$) between weaning period and zones. The overall weaning period in southern and northeastern zone was 3.91 ± 0.16 and 5.54 ± 0.19 months, respectively. Ram lambs are weaned earlier than ewe lambs. The weaning period observed in the present study was higher than that reported by Padmanabhan (1994) and Report (1995). In village conditions, lambs go with ewes for grazing from 20-30 days of age and suckle their mother until they become pregnant in the subsequent breeding cycle. Weaning is influenced by sex of the lamb and demand for sale. In that case ram lambs are weaned earlier than ewe lambs by the farmers.

Lambing Interval

The lambing interval ranged between 9.13 ± 0.39 and 11.80 ± 0.12 months with an overall mean of 10.98 ± 0.21 months in southern zone. In northeastern zone the corresponding values were 11.90 ± 0.10 , 11.95 ± 0.30 and 11.88 ± 0.09 months. The present finding are comparable with that of Nagy *et al.*, (1991), Galal *et al.*, (1996), Sahana *et al.*, (2004), Dineshkumar *et al.*, (2006) and Kandasamy *et al.*, (2006). Adequate grazing, nutritional status and health of the individual animal might influence this parameter.

Lambing Calendar in Flocks

Month var lambing calendar in sheep flocks of the study areas as reported by sheep farmers are presented in Table 2. Majority of the farmers reported that lambing occurred in their flocks during the month of November in southern and northeastern zones (81.57 and 88.75 per cent) followed by the month of October (71.25 and 83.75 per cent) and December (70.62 and 75.63 per cent). In both the zones lambing was reported in different flocks throughout the year but October, November and December months were the main lambing months where the lambing were recorded in majority of the flocks, whereas 58.12 per cent of the farmers in southern zone and 61.25 per cent of the farmers in northeastern zone reported

Table 1: Least Square Mean $\pm$ Se of Reproductive Performance of Sheep in Study Area

Effect	No of observations	Lambing percentage	Twinning percentage	Weaning percentage	Age at first mating – Female (months)	Age at first mating – Male (months)	Age at first lambing (months)	Weaning period (months)	Lambing interval (months)
SOUTHERN ZONE									
Dindugul	40	96.34 ^a $\pm$ 0.34	3.31 ^a $\pm$ 0.45	89.54 ^a $\pm$ 0.69	12.65 ^{ac} $\pm$ 0.53	20.10 ^a $\pm$ 0.63	17.80 ^{ac} $\pm$ 0.54	2.10 ^a $\pm$ 0.21	9.13 ^a $\pm$ 0.39
Pudukkottai	40	96.08 ^a $\pm$ 0.53	1.59 ^b $\pm$ 0.32	90.64 ^b $\pm$ 0.91	14.25 ^b $\pm$ 0.10	21.77 ^a $\pm$ 0.69	19.67 ^b $\pm$ 0.44	4.70 ^c $\pm$ 0.17	11.68 ^b $\pm$ 0.15
Sivagangai	40	98.92 ^b $\pm$ 0.25	0.69 ^b $\pm$ 0.10	93.16 ^b $\pm$ 0.59	11.60 ^a $\pm$ 0.18	19.60 ^a $\pm$ 0.65	16.83 ^a $\pm$ 0.21	4.00 ^b $\pm$ 0.09	11.80 ^b $\pm$ 0.12
Tirunelveli	40	97.88 ^c $\pm$ 0.32	0.48 ^b $\pm$ 0.14	84.96 ^c $\pm$ 1.64	13.15 ^{bc} $\pm$ 0.38	23.10 ^b $\pm$ 0.34	18.48 ^{bc} $\pm$ 0.38	4.84 ^c $\pm$ 0.14	11.60 ^b $\pm$ 0.70
Overall mean	160	97.30 $\pm$ 0.36	1.52 ^{**} $\pm$ 0.26	89.57 ^{**} $\pm$ 0.96	12.90 $\pm$ 0.49	21.11 [*] $\pm$ 0.58	18.19 $\pm$ 0.39	3.91 ^{**} $\pm$ 0.16	10.98 ^{**} $\pm$ 0.21
NORTHEASTERN ZONE									
Kancheepuram	40	98.17 $\pm$ 0.48	0.40 $\pm$ 0.18	81.54 $\pm$ 2.55	12.20 ^a $\pm$ 0.35	20.10 ^a $\pm$ 0.79	17.20 ^a $\pm$ 0.38	5.51 $\pm$ 0.24	11.93 $\pm$ 0.04
Villupuram	40	97.36 $\pm$ 0.49	0.34 $\pm$ 0.16	78.31 $\pm$ 2.04	12.05 ^a $\pm$ 0.32	18.05 ^b $\pm$ 0.68	17.15 ^{ac} $\pm$ 0.37	5.56 $\pm$ 0.24	11.90 $\pm$ 0.10
Vellore	40	98.42 $\pm$ 0.49	1.30 $\pm$ 0.47	83.08 $\pm$ 1.72	17.35 ^b $\pm$ 0.34	17.93 ^b $\pm$ 0.44	21.43 ^b $\pm$ 0.42	5.58 $\pm$ 0.14	11.75 $\pm$ 0.18
Tiruvannamalai	40	97.14 $\pm$ 0.79	0.45 $\pm$ 0.17	82.33 $\pm$ 1.46	12.38 ^a $\pm$ 0.21	19.80 ^a $\pm$ 0.51	17.05 ^c $\pm$ 0.22	5.54 $\pm$ 0.14	11.95 $\pm$ 0.30
Overall mean	160	97.78 $\pm$ 0.56	0.63 ^{**} $\pm$ 0.25	81.32 ^{**} $\pm$ 1.94	13.41 $\pm$ 0.32	18.97 [*] $\pm$ 0.89	18.97 $\pm$ 0.89	5.54 ^{**} $\pm$ 0.19	11.88 ^{**} $\pm$ 0.09

Mean in the same column with different superscripts differ significantly ($p \leq 0.05$)
 Overall mean in the same column differ significantly (* $p \leq 0.05$ and ** $p \leq 0.01$)

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Table 2: Lambing Calendar in Sheep from Different Flocks of the Study Area

Months	Southern Zone					NORTH EASTERN ZONE				
	DINDUGUL N=40	PUDUKKOTTAI N=40	SIVAGANGAI N=40	TIRUNELVELI N=40	TOTAL N=160	KANCHEEPURAM N=40	VILLUPURAM N=40	VELLOR N=40	TIRUVANNAMAILAI N=40	TOTAL N=160
January	15	15	14	12	73 (45.62)	18	15	17	12	82 (51.25)
February	3	4	2	2	31 (19.37)	3	4	9	7	43 (26.57)
March	4	5	5	6	20 (12.50)	5	2	2	3	22 (13.75)
April	17	27	19	30	93 (58.12)	18	17	26	21	98 (61.25)
May	10	30	12	12	64 (40.00)	17	14	21	22	74 (46.25)
June	3	2	4	2	29 (18.12)	5	2	2	3	12 (7.50)
July	4	1	2	4	30 (18.75)	4	3	3	4	14 (8.75)
August	2	4	2	4	29 (18.12)	3	2	2	3	30 (18.75)
September	26	6	14	17	63 (39.37)	21	18	7	8	54 (33.75)
October	29	24	31	30	114 (71.25)	37	31	34	32	134 (83.75)
November	27	36	32	36	131 (81.57)	39	34	32	37	142 (88.75)
December	39	31	31	32	113 (70.62)	37	39	30	33	121 (75.63)

N = no of flocks.

Figure in parenthesis indicate percentage of flocks which had lambing.

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lambling in their flocks during the month of April. It is observed that lambling occurred in the flocks of both the zone throughout the year, which is in agreement with the findings of Chaarami and Robinson (1992), Metha *et al.*, (1995), Galal *et al.*, (1996) and Kandasamy *et al.*, (2006). The incidence of lambling was high during the months of October, November and December (winter), which can be designated as major lambling season. This finding agrees well with the findings of Padmanabhan (1994), Galal *et al.*, (1996), Chandran (1998), Jagatheesan (2001), Dineshkumar *et al.*, (2006) and Kandasamy *et al.*, (2006).

The month of April and May is observed to be the minor lambling season (summer). December to February by Chandran (1998), August to October by Jagatheesan (2001), February to July by Kandasamy *et al.*, (2006) and September to October by Kuldeep Porwal *et al.*, (2006) were reported as minor lambling season in their study elsewhere.

CONCLUSION

It was concluded from the study to assess the reproductive performance of sheep in field flocks of Tamil Nadu that the lambling percentage, twinning percentage, weaning percentage, age of ewes at first mating (months) age of rams at first mating (months), age at first lambing (months), weaning age (months) and lambing interval (months) in Southern and North Eastern agro climatic zones in Tamil Nadu were reported to be 97.30 and 97.78, 1.52 and 0.63, 89.57 and 81.32, 12.90 and 13.41, 21.11 and 18.97, 18.19 and 18.97, 3.91 and 5.54, and 10.98 and 11.88 respectively. Overall twinning percentage, weaning percentage, age of males at first mating, weaning period and lambing interval differed significantly between the zones. Peak lambling season in the flocks was reported to be in the month of November in both the zones followed by October and December. However, lambling was present in the flocks throughout the year. It was suggested that good management practices coupled with training of farmers through extension methods would enhance the reproduction performance of sheep in the state.

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