

REPRODUCTIVE PERFORMANCE OF NILAGIRI AND SANDYNO EWES

R. ANILKUMAR*, C. CHANDRAHASAN¹, M. SELVARAJU² and
A. MANICAVASAKA DINAKARAN³

Sheep Breeding Research Station,
Tamilnadu Veterinary and Animal Sciences University,
Sandynallah, Ooty, The Nilgiris.

ABSTRACT

The tupping percentage, lambing percentage, litter size, twinning percentage were worked out from the reproductive records (1993-2002) available at Sheep Breeding Research Station, Sandynallah, Nilgiris District. Nilagiri ewes were superior to Sandyno ewes in tupping percentage (74.60 ± 0.74 vs. 60.30 ± 0.65 per cent), lambing percentage (92.10 ± 0.85 vs. 90.00 ± 0.83 per cent), litter size (1.12 ± 0.01 and 1.05 ± 0.01) and twinning percentage (12.51 and 6.43 per cent). The ewes from both breeds had higher reproductive performance during main breeding season than off breeding season (Tupping percentage: 92.10 ± 0.57 and 36.30 ± 0.85 per cent, lambing percentage: 94.60 ± 0.58 and 88.00 ± 1.20 per cent and litter size: 1.10 ± 0.01 and 1.07 ± 0.01 in main breeding season and off breeding season respectively). The age of ewes at breeding had significant effect on tupping percentage, lambing percentage and litter size at birth. Ewes aged from 3½ - 5½ years performed at their best and the reproductive performance declined after 6½ years.

Keywords: Nilagiri ewes, Sandyno ewes, Tupping and lambing percentage, Litter size

INTRODUCTION

Sheep farming are generally carried out as a dry land enterprise in harsh environment. In this kind of harsh environment the sheep develop better survival character at the expense of their ability to produce. Hence the reproductive efficiency of most of our flock is relatively low (Mittal *et al.*, 2004). The reproductive efficiency of sheep maintained in the hilly areas with good pasture land is better than those maintained in tropics of India. However, the studies on the reproductive performance of Indian breeds of sheep are scanty. The Nilagiri breed of sheep is a short statured woolly breed of sheep inhabiting the hilly regions of the Nilgiris district in Tamilnadu. The Sandyno breed of sheep is a 5/8th cross

of Merino with Nilagiri breed of sheep. Both the breeds are the unique apparel wool breeds of South India. The present study was carried out to study the reproductive performance and the effect of genetic and on genetic factors on the reproductive performance of Nilagiri and Sandyno breed of sheep.

MATERIALS AND METHODS

The reproductive records of the Nilagiri and Sandyno breeds for the period from 1993-2002 maintained at Sheep Breeding Research Station (SBRS), Sandynallah - 643 237, The Nilgiris District of Tamilnadu State were utilized for the study. The particulars regarding date of birth, breeding details viz date of breeding, season of breeding, age at breeding, lambing details such as date of lambing, number of lambs born, nature of lambing (alive, stillborn or aborted) birth weight and weaning weight of lambs were collected. Based on these data the reproductive performance of Nilagiri and Sandyno ewes were worked out as follows.

Tupping percentage - Number of ewes bred to the number of ewes available for breeding, expressed as percentage.

Part of Ph.D., thesis submitted to the Tamil Nadu Veterinary and Animal Sciences University, Chennai - 51.

*Associate Professor

¹Dean, Veterinary College and Research Institute, Namakkal.

²Associate Professor and Head, Dept. ARGO, VC&RI Namakkal.

³ Professor and Head, Department of Veterinary Epidemiology and Preventive Medicine, VC&RI, Namakkal. 637 001.

Lambing percentage – Number of ewes lambing to the number of ewes bred expressed in percentage.

Litter size – Number of lambs born to the number of ewes lambing.

Twinning percentage – Number of twin births to the total births, expressed in percentage.

The effects of season of breeding, breed and age on tupping percentage, lambing percentage, litter size and twinning percentage were analyzed.

Least square procedure (Harvey, 1990) was used to study the effects of treatment and other factors on various traits. All possible interactions with set of fixed effects were fitted initially and insignificant interaction effects were omitted. The linear statistical model was used for analysis of various traits. Arcsin transformation was done for tupping and lambing percentage. The differences between the least square means for subclasses under a particular effect were tested by Duncan's multiple range test modified by Kramer (1957).

RESULTS AND DISCUSSION

Nilagiri ewes had significantly higher tupping percentage (74.60 ± 0.74 vs 60.30 ± 0.65 ; $P < 0.01$) and lambing percentage (92.10 ± 0.85 vs 90.00 ± 0.83 ; $P < 0.05$) than Sandyno ewes. Similar lambing percentage as observed in the present study were obtained by Mohan *et al.*, (1986) and Rajendran (2005). The Nilagiri breed had higher lambing percentage than other Indian sheep breeds (Mehta *et al.*, 2003, Raman *et al.*, 2003 and Karunanithi, 2004). The Sandyno ewes had a higher lambing percentage (90.00 per cent) than other cross breeds (Sahni *et al.*, 1976 and Nawaz and Ahmad, 1998).

Tupping (92.10 ± 0.57 and 36.30 ± 0.85) and lambing percentage (94.60 ± 0.58 and 88.00 ± 1.20) for ewes bred during the main breeding season was higher than off breeding season. The significant difference in the present study was in agreement with Mehta *et al.*, (2003) and Rajendran (2005). The higher tupping and lambing percentage obtained in the main breeding season might probably be due to the better nutritional status of the ewes bred during the main breeding season, which gets good grazing during south west monsoon and the north east monsoon. The summer season

follows the winter season when the ewes were exposed to poor pasture due to ground frost and poor fodder, leads to lower lambing percentage. This finding was in consonance with Dixit *et al.* (2002).

Age of ewes at breeding had significant ($P < 0.01$) influence on tupping and lambing, which was evident from the observation that tupping percentage was lower in $1\frac{1}{2}$ - $2\frac{1}{2}$ and slowly increased from $2\frac{1}{2}$ - $3\frac{1}{2}$ year ewes and maintained the high level up to $6\frac{1}{2}$ years. The tupping percentage started declining in ewes above $6\frac{1}{2}$ years (78.80 per cent). Similar trend in effect of age on tupping percentage was observed by Rajendran (2005). Similarly the ewes aged $3\frac{1}{2}$ - $4\frac{1}{2}$ and $4\frac{1}{2}$ - $5\frac{1}{2}$ years had the highest lambing percentage and it was low in ewes aged $1\frac{1}{2}$ to $2\frac{1}{2}$ years. This finding was in agreement with the reports of Iyue (1993) Dixit *et al.* (2002) and Rajendran (2005).

The litter size at birth was significantly higher ($P < 0.01$) in Nilagiri ewes when compared to Sandyno ewes. The mean litter size at birth observed for Nilagiri ewes was in agreement with the values obtained by Mohan *et al.* (1986). The litter size for Sandyno ewes (1.05 ± 0.01) was closer to the values obtained by Iyue (1993) for Sandyno ewes. Nilagiri ewes had higher twinning percentage (12.51 per cent) than Sandyno ewes (6.43). Similar observations were made by Anil Kumar *et al.* (2005) and Rajendran (2005). Nilagiri and Sandyno ewes had higher twinning rate than the other Indian breeds (Raman *et al.*, 2003 and Karunanithi, 2004).

The ewes bred during the main breeding season had better litter size at birth (1.10 ± 0.01 vs 1.07 ± 0.01) and twinning percentage (9.84 vs 7.22 per cent) than those ewes bred during off breeding season. The better response during the main breeding season might be due to development of more ovarian follicles as a result of improved nutritional status of animals during the monsoon period. The development of ovarian follicles was reported to be affected by nutrition and in turn the multiple ovulations and lambs born (Smith, 1988). Significant effect of season of breeding on litter size was also reported by Kleemann *et al.* (2006).

Litter size at birth was significantly different among the ewes from different age groups studied. The litter size was lowest in primiparous ewes and increased as the age advanced. Nawaz and Ahmad (1998) and

Rajendran (2005) found that the litter size was consistently lower in primiparous ewes with a significant increase at two, three and four years of age. The twinning was lowest in 1 ½ - 2 ½ year ewes than other age groups. The twinning percentage decreased after 6 ½ years. Similarly, Dickerson and Glimp (1975) observed that the fecundity increased from 100 per cent or more for maiden ewes to 160 per cent for ewes aged 6 years and decreased to 135 per cent in 9 years old ewes.

In conclusion it was found that the Nilagiri ewes were superior to Sandyno ewes in tupping percentage, lambing percentage, litter size and twinning percentage. The ewes from both breeds had higher reproductive performance during main breeding season than off breeding season. As the age advance the reproductive performance also improved and it declined after 6½ years of age.

REFERENCES

- Anil Kumar, R., Srinivasan, P. and Iyue, M. (2005). Twinning pattern in Nilagiri ewes. *Indian J. Anim. Sci.*, 75: 32-34.
- Dickerson, G.E. and Glimp, H.A. (1975). Breed and age effects on lamb production of ewes. *J. Anim. Sci.*, 40: 397-408.
- Dixit, S.P., Dhillon, J.S. and Singh, G. (2002). Sources of variation in reproductive traits of Bharat Merino sheep. *Indian J. Anim. Sci.*, 72: 328-331.
- Harvey, W.R. (1990). Mixed Model Least-squares and Maximum Likelihood Computer Programme. PC-2 version. Ohio State University, Columbus.
- Iyue, M. (1993). Genetic and Phenotypic Evaluation of Nilagiri Synthetics. Ph.D., Thesis, Tamilnadu Veterinary and Animal Sciences University, Chennai, India.
- Karunanithi, K. (2004). Final Report of Survey, Evaluation and Characterization of Mecheri Sheep Breed. Tamilnadu Veterinary and Animal Sciences University, Chennai and National Bureau of Animal Genetic Resources, Kamal, India.
- Kleemann, D.O., Grosser, T.I. and Walker, S.K. (2006). Fertility in South Australian commercial Merino flocks: aspects of management. *Theriogenology*, 65: 1649-1665.
- Kramer, C.Y. (1957). Extension of multiple range tests to group correlated adjusted means. *Biometrics*, 13:13-18.
- Mehta, S.C., Singh, V.K., Ayub, M. and Mehrotra, V. (2003). Growth and reproductive performance of Magra breed of sheep. *Indian J. Anim. Sci.*, 73: 1147-1149.
- Mohan, M., Ulaganathan, V., Rodricks, I.M., Bhuvanakumar, C.K. and Iyue, M. (1986). Reproduction rate and viability of Merino, Nilagiri and halfbred Merino. I. Fertility, prolificacy and viability. *Trop. Anim. Hlth. Prod.*, 18: 171-176.
- Mittal, J.P., Maurya, V.P. Anil Joshi and Naquvi, S.M.H., (2004). Role of nutrition in augmenting reproduction in sheep. In: Proceedings of the National Seminar on Opportunities and Challenges in Nutrition and feeding management of sheep, goat and rabbit for sustainable production. Feb 10-12,2004, Avikanagar, Rajasthan, India. pp 246-253.
- Nawaz, M. and Ahmad, M.K. (1998). Comparison of Lohi and crossbred ewes: Productive and reproductive traits. *Small Rumin. Res.*, 27: 223-229.
- Rajendran, R. (2005). Genetic analysis of reproduction traits and survivability of Nilagiri sheep and its Synthetic crosses. Ph.D., Thesis, Tamilnadu Veterinary and Animal Sciences University, Chennai, India.
- Raman, K.S., Sundararaman, M.N., Haribhaskar, S. and Ganesakale, D. (2003). Biometrics and breed characteristics of Madras Red sheep. *Indian J. Small Rumin.*, 9: 6-9.
- Sahni, K.L., S.B.Tiwari and M.S.Sahani, (1978). Effect of season on the occurrence of oestrus and fertility in different breeds of sheep under semi-arid conditions. *Indian Vet. J.*, 53: 515-522.
- Smith, J.F., (1988). Nutrition and ovulation rate in the ewe. *Aust. J. Biol. Sci.*, 41:27-36.