International Journal of Innovative Research and Advanced Studies (IJIRAS)
Volume 4 Issue 4, April 2017

ISSN: 2394-4404

Reproductive Performance Of Mandya Sheep Under Farm Conditions

Siddalingamurthy, H. K.

Associate Professor and Head, LRIC(S), KVAFSU, Nagamangala, Mandya (dst.), Karnataka

Manjunatha, S. S.

Assistant Professor, LRIC(S), KVAFSU, Nagamangala, Mandya (dst.), Karnatak

Sreesujatha, R. M.

Research Associate, LRIC(S), KVAFSU, Nagamangala, Mandya (dst.), Karnataka

Abstract: ***The present study was undertaken on 733 lambing records to study the reproductive traits of Mandya sheep maintained at Livestock research and information centre (Sheep), Mandya district, Karnataka for the period of seven years from 2010-2016. The overall age at sexual maturity, age at first lambing, service period and lambing interval was recorded to be 464.91±9.12, 632.96±10.80, and 110.18±2.01, 262.85 ±2.01 days, respectively. Year of birth had a significant influence on all the traits considered for study which reflects the variable climatic and management practices from year to year. The season of birth was found to have significant effect on age at first lambing, service period and lambing interval and non-significant effect on age at sexual maturity. The significant effect of season of birth might be due to the availability of green succulent fodder and favourable climatic conditions supporting growth and reproductive performance.***

Keywords: ***Mandya sheep, reproductive traits, non-genetic factors.***

I. INTRODUCTION

Reproduction is an important physiological phenomenon which is responsible for the continuity of generation of germplasm as well as the initiation of their production (Das *et al*., 2004). Age at sexual maturity, age at first lambing, service period and lambing interval are the important reproductive traits which determines the reproductive and productive life of an animal. For economic sheep production, ability of the sheep to produce first lamb at an earlier age and subsequent lambings with short interval increases the life time of lamb and milk production which have significant impact on flock productivity and reproductivity as a whole. There are many non-genetic factors which influence the phenotypic expression of the growth, reproduction and production of sheep (Dixit *et al.*, 2001). There is facity of recent information on the reproductive performance of Mandya sheep which perhaps the best meat breed of the country as far as quality and confirmation are concerned. Therefore, the present study was undertaken with the objective to see of the effect of various non-genetic factors on reproductive traits under organized farm conditions in Karnataka.

II. MATERIALS AND METHOD

Data pertaining to 733 lambing records on Bandur sheep maintained at Livestock Research and Information Centre (Sheep), Nagamangala, KVAFSU, Mandya District, Karnataka over the period of seven years from 2010 to 2016 were considered for assessing various reproductive traits of Bandur sheep. In the farm sheep were maintained under semi-intensive system of management. Sheep were grazed from 10 am to 4.30 pm on the natural grass available in the farm grazing lamb throughout the year. In addition to the grazing the lambs of age 3-6 months, 6-12 months, adult and pregnant

ewes were fed with concentrates @ 100g, 200g, 250g and 300g, respectively containing with crude protein 21% for the lambs upto 1 year and 16% for adult and pregnant ewes. During lean period when grazing material is dry and scarce tree loafing of neem, banyan and agasse were also fed to all the animals. The breeding rams were left for minimum 7 hours of grazing on the natural vegetation of the farm. They were also provided with succulent green fodder including legumes and concentrates @ 350g/per day/ Ram. In the shed all the animals were allowed for free access to clean water and salt licks.

The pregnant ewes were separated one month before lambing from the flock and housed in lambing pens. They were provided with succulent green fodder and concentrates @300g/day/animal. This additional feeding being given to these ewes until weaning of their lambs. Lambs were allowed to suckle and remain with their mothers' upto three months of age and weaned thereafter. The mothers upto three months from the lambing date were kept separately in a group and grazed close to the corrals with a view to bring them back to shed at noon for suckling their young lambs.

The data on reproductive traits from 2010 – 2016 were classified according to year of birth, season of birth, year of lambing, season of lambing, year of breeding and season of breeding of an ewe. Ewes were bred throughout the year. Based on the occurrence of oestrus The season of birth was classified into season I (February to May), season II (June to September) and season III (October to January). Based on the incidence of oestrus major breeding activities were observed in the month of June to September and the minor breeding activities during February to May. While the least breeding activities were observed during October to January. Hence the breeding season in Bandur sheep is considered as main breeding season, off breeding season and lean breeding season, respectively. Consequently three lambing seasons formed were the main lambing season from October to January, off lambing season from June to September and lean lambing season from February to May.

Selective breeding was practised in a maximum way followed by flock mating system. Breeding rams were allowed to mate during night and morning hours in the flock. Breeding rams will be selected based on individual body weight and external phenotypic appearance. Sheep were periodically culled at the age of seven to eight years irrespective of their production abilities and due to other abnormalities which rendered them uneconomical to maintain in the flock. Animals were regularly vaccinated against the prevalent diseases namely foot and mouth disease, blue tongue, Peste des petits ruminants, enterotoxemia, Haemorragic septecemia. Animals were dewormed once in four months with antihelmintic for internal parasite and dipped twice yearly for external parasite. All the pens were sprayed with acaricide twice a year and each pen kept empty atleast for one month in a year to avoid external parasitic problems. Data used in the present study comprised of unequal sub class frequencies thus leading to non-orthogonality. To overcome non-orthogonally of data the least squares analysis of variance technique was adopted to detect the significant sources of non-genetic variation if any.

The following fixed model (Harvey, 1987) was used for analysis of age at sexual maturity and age at first lambing,

$Y_{ijk} = \mu + Y_i + S_j + e_{ijk}$

Where,

Y_{ijk} = the record of m^{th} individual belonging to i^{th} year of birth, j^{th} season of birth.

μ = population mean

Y_i = fixed effect of i^{th} year of birth (i =1, 2, 3, 4,5)

Sj = fixed effect of j^{th} season of birth (j = 1, 2, 3)

e_{ijk} = Random error associated with Y_{ijk} and assumed to be, identically, independently and normally distributed with mean zero and the unit variance (0, σ2e) and interaction between various effects was assumed to be zero.

The following fixed model was used for analysis Service period and lambing interval,

$Y_{ijk} = \mu + Y_i + S_j + e_{ijk}$

Where,

Y_{ijk} = the record of m^{th} individual belonging to i^{th} year of lambing, j^{th} season of lambing.

μ = population mean

Y_i = fixed effect of i^{th} year of lambing (i =1, 2, 3, 4,5,6,7)

Sj = fixed effect of j^{th} season of lambing (j = 1, 2, 3)

e_{ijk} = Random error associated with Y_{ijk} and assumed to be, identically, independently and normally distributed with mean zero and the unit variance (0, σ2e) and interaction between various effects was assumed to be zero.

III. RESULT AND DISCUSSION

AGE AT SEXUAL MATURITY

In Bandur ewe the age at sexual maturity was recorded to be 464.91 ± 9.12 days (table. 1). Age at sexual maturity obtained in this study was higher to that of Bijurkar *et al*. (2015) in Kenguri ewes (300.6 ± 3.52 days) and lower to that of Rajanna *et al*. (2012) in Nellur ewes (610.00 ± 3.82days) and Dixit *et al*. (2001) Bharat Merino Sheep (580.13 days). It is a managemental trait which can be reduced by improving nutritional and other management practices.

The effect of year of birth was found to have significant effect on age at sexual maturity in Mandya ewes. The ewes which were born during the year 2012 (420.65 ± 15.87 days) matured earlier than those born during 2013, 2014 and the difference found among them was significant. The reason may be attributed to that of young lambs which were subjected to variable environmental and managemental conditions in different years resulting in differential growth in pre pubertal life leading to variation in age at sexual maturity.

Season of birth of ewe was found to have significant effect on age at sexual maturity on Mandya ewes. The age at sexual maturity was significantly lower in the ewes born during off lambing season (444.40 ± 15.42 days) than those ewes born during main lambing season (474.87 ± 14.62 days) and lean lambing season (472.25 ± 16.94 days). Significantly lower age at sexual maturity is observed in the ewes born during off lambing season might be due to these ewe born during the month of July to September and passed a period from October to January were monsoon and winter seasons, respectively. These are the favourable seasons regarding the availability of succulent green fodder and good climatic conditions could support the prenatal, postnatal, pre-pubertal

ISSN: 2394-4404

and pubertal growth leading to early maturity than the ewes born in other two seasons.

AGE AT FIRST LAMBING

The overall least square means of age at first lambing was 632.96±10.80 days (table. 1). This observation is tallied with the reports of Narayanaswamy *et al*. (1976) and Rai *et al*. (1988) in the Bandur breed. The age at first lambing was found to be higher than reported by Mohanthy and Mishra 1992 in Ganjam breed (593.00±8.80 days) of sheep in Orissa and 330 to 390 days reported by Ghalasasi and Nimbkar, 1993 in Garole breed. The observed value was found to be lower than those reported by Krishnareddy *et al*. (1984) in Nellur, Nimkar 1993 in Decanni, Dixit *et al*. (2001) in Bharat Merino sheep (730.13 days), Lalit *et al*. (2016) in Haranali sheep and Purushothan 1972, Krishnareddy *et al.* (1984) and Siddalingamurthy in 2001 in Mandya sheep. The large variability within and among the breeds indicates that there is an ample scope for the improvement of this trait.

The year of birth of ewe had significant effect on age at first lambing where the ewes born during 2013 (721.76 ± 27.86 days) took longest period to lamb for the first time and those born in 2012 (573.95 ± 16.90 days) took the shortest period to drop their first lamb. Significant effect on year of birth on age at first lambing were also observed by Krishnareddy *et al*. (1984) in Nellur , Arora and Swarnkar, 1995 in Malpura, Siddalingamurty in 2001, Vasundra devi 2013 in Bandur sheep and Lalit *et al*. (2016) in Harnali sheep. However, Krishnareddy *et al.* (1984) reported no significant effect on year of birth on age at first lambing in Nellur and Mandya ewes. Significant difference among years might be attributed to the variations in environmental conditions and availability of feed, fodder and water.

The influence of season of birth on age at first lambing was found to be significant. The ewes born during off lambing season had significantly lower age at first lambing than those ewes born during the remaining two seasons. This was in agreement with the reports of Narayanaswamy *et al.* (1976) and Siddalingamurthy (2001) in Mandya sheep and Krishnareddy *et al.* (1984) in Nellur breed. However, Reddy (1980) in Nellur, Gupta and Reddy, 1986 in Mandya ewes reported a non-significant effect on this trait. The significant effect of season of birth of ewe on age at first lambing might have been due to the function of body weight at birth and subsequent gain in body weight at later stages growth and may be due to those ewes born in off lambing season between July to September was monsoon season and paused a period from October to January was winter season are being the favourable seasons with climatic conditions were plenty of quality green fodder was available which could meet the optimum nutrients for the growth, thus leading to increased birth weight and weaning weight, than the ewes born during other two seasons. Further possibility of carry over effect of birth and weaning weight in their pre-pubertal and later life could lead to earlier conception and dropping of their first lamb earlier than the ewes born in other two seasons.

LAMBING INTERVAL

The overall least squares mean in lambing interval was found to be 262.85±2.01 days (table. 1). These observations are tallied with the reports of Rai *et al*. (1988) in Mandya sheep and Bijur kar *et al*. (2015) in Kenguri sheep breed. Higher number of days than the present study was reported by Krishnareddy *et al*. (1984) in Nellur, Nimbkar, 1983 in Decanni, Arora and Swarnkar (1995) in Malpura, Dixit *et al*. (2001) in Bharat Merino sheep (290.26 days), Lalit *et al.* (2016) in Harnali sheep, Narayanaswamy *et al*. (1996) and Siddalingamurthy, 2001 in Bandur sheep. While a lower value was reported by Ghalasasi and Nimbkar, 1993 in Garole breed. Large variability in the lambing interval suggests that there is possibility for the improvement of this trait through better feeding and breeding management.

The effect of year of lambing on lambing interval was found to be significant. The ewes lambed during the year 2013 (240.26 ± 3.21 days) had lowest lambing interval. This was found to be similar with the reports of Narayanaswamy *et al*. (1976) and Gupta and Reddy, 1986 and Siddalingamurthy, 2001 in Mandya sheep. However, Krishnareddy *et al*. (1984) reported non-significant effect of year of lambing on lambing interval in Nellur ewes. The effect of year on these traits reflects the changes in management and nutritional status from year to year.

The effect of season of lambing had a significant effect on lambing interval. The lambing interval of ewes lambed during lean lambing season (Feb-May) was significantly lower (249.45 ± 3.60 days) than those ewes lambed during main lambing season and off lambing season. This finding supports the earlier report of Narayanaswamy *et al*. (1976), Gupta and Reddy, 1986 and Siddalingamurthy, 2001 in Mandya Sheep. Nevertheless to this Reddy, 1980 and Krishnareddy *et al*. (1984) in Nellur breed found a non-significant effect of season of lambing on lambing interval. Lower lambing interval observed in the ewes which were lambed during lean lambing season had a chance to conceive as soon as their lambs were weaned at 90 days of age as this season of lambing immediately followed by main breeding season.

SERVICE PERIOD

The overall mean service period recorded in Mandya sheep was 110.18±2.01 days (table. 1). The service period found in present study was lower to the findings of Tailor *et al.* (2006) in Sonadi sheep (124.99±4.22 days). Higher service period as compared to the present study was obtained by Gupta and Reddy, 1986 in Mandya sheep (233.8 days). Variation in service period might be attributed due to inefficiency of heat detection, difference in feeding and breeding management.

The effect of year of lambing is found to have significant effect on service period. The service period in the ewes lambed during the year 2013 (87.57 ± 3.21 days) had significantly lower than the ewes lambing during remaining years. Significant effect of year of lambing on service period was also reported by Gupta and Reddy, 1986 in Mandya and Mandya synthetic ewes. Significant variation observed in

ISSN: 2394-4404

service period among the years might be due to failure in proper heat detection and difference in breeding management.

Effect of season of birth on service period in this study was found to be significant in Bandur ewes. The service period in the ewes lambed during lean lambing season (96.80 ± 3.60 days) was significantly lower than those ewes lambed during main lambing and off lambing season. Significant effect of season of lambing on service period was also by Gupta and Reddy, 1986 in Mandya and Mandya synthetic ewes. Significantly lower service period was noticed in the ewes lambed during lean lambing season which might be due to the lean lambing season was immediately followed by main lambing season which in turn had a chance to bred as soon as their lambs weaned at 90 days of age.

IV. CONCLUSION

An attempt was made to study the effect of non-genetic factors like year of birth, season of birth, year of lambing and season of lambing on reproductive traits which age at sexual maturity, age at first lambing, service period and lambing interval of popular mutton breed of Mandya sheep under farm condition. This study indicates that ewes born in off lambing season had significantly lower age of sexual maturity and earlier dropping of the first lamb than the ewes born during other two seasons. Significantly shorter lambing interval and service period was also observed in the ewes lambed during off lambing season than the ewes lambed in other two seasons. In conclusion it can be seen that there is an ample scope for the improvement its reproductive traits through breeding management to low the number of days in the traits such as age at first service, age at first lambing, service period and lambing interval for profitable sheep farming.

REFERENCES

[1] Arora. A. L. and Swarnkar, C. P. (1995). Factors affecting age and weight at first breeding and first lambing in Malpura ewes. *Indian J. small Ruminants*, 1: 22—25.
[2] Bijurkar, R. G., Tandle, M. K., Khaja, M., Jadhav, N.V. and Waghmare, P. G. (2015). Reproduction traits of Kenguri ewes. *Frontier J. Vet. Anim. Sci.*, 2(2): 114-115.
[3] Das, B., Das, D., Aziz, A., Roy, T. C. and Kalita, D. (2004). Factors affecting reproductive performance of Assam Local and crossbred goats. Indian Veterinary Journal. 81:1352-1354.
[4] Dixit, S. P., Dhillon. J. S. and Singh, G. (2001). Sources of variation in reproductive traits of Bharat Merino sheep. Indian journal of animal sciences, 72(4): 328-331.
[5] Ghalasai, P. M. and Nimbkar, B. V. (1993). The "Garole" micro sheep of Bengal. *Anim. Genet. Ress. Inform*., 12: 73-79.
[6] Gupta, B. R., Reddy, K. K. (1986). Reproductive traits of Mandya and Mandya synthetic ewes. *Ind. J. Anim. Sci*., 56:773-78.
[7] Harvey, W. R. (1987). Least squares analysis of data with unequal subclass numbers. ARS, USDA.
[8] Krishnareddy, A., Sharma, P. L. N., Rao, V. P. and Dutta, O. P. (1984). The influence of non-genetic factors on reproductive traits in Nellore sheep. *Indian Vet. J*., 61: 59-63.
[9] Lalit, Malik, Z. S., Dalal, D. S., Patil, C. S. and Dahiya, S. P. (2016). Genetic studies on growth, reproduction and wool production traits in Harnali sheep. *Indian Journal of Animal Research.* DOI: 10.18805/ijar.10984.
[10] Mohanty, S. C., and Mishra, M. (1992). Reproductive performance and mortality in Ganjam and Balangir Sheep. *Indian J. Anim. Prod. Mangt*., 83: 160-163.
[11] Narayanaswamy, M., Daya Singh Balaine and Balbir Singh. (1976). A note on studies on age at first lambing and lambing interval in Bannur (Mandya) sheep. *Indian J. Anim. Sci*., 46(1): 47-49.
[12] Nimbkar, C. (1993). The goats and sheep of the Deccan plateau in Maharastra state of India. *Anim. Genetic Resources Inform*., 12: 81-91.
[13] Purushotham, C.H. (1972). Comparative study of the production and reproduction traits in Nellore and Mandya sheep. M.V.Sc., Thesis, A.P.A.U., Hyderabad, A.P.
[14] Rai, A. V., Desai, D. S. and Rao, H. K. R. (1988). Performance of Mandya Sheep. *Curr. Res.*, 81: 11-12.
[15] Rajanna, N., Mahendar, M., Raghunandan, T., Sreenivasarao, D., Nagalakshmi, D. and Tammiraju, D. (2012). Reproductive performance of Nellore sheep in different agroclimatic zones of Telangana. *Animal Science Reporter*, 6(4): 142-145.
[16] Reddy, A .K. (1980). Studies on certain economic traits in Nellore breed of sheep. M.V.Sc., Thesis, A.PA.U., Hyderabad.
[17] Siddalinga Murthy, H. K. (2001). Evaluation of Bandur sheep in Mandy District of Karnataka for economic traits. M.V.Sc. Thesis submitted to UAS, Bangalore.
[18] SAS, Version 9.3. 2011. SAS Inst. Inc. Cary, NC, USA.
[19] Tailor, S. P., Gupta, L. and Nagda, R. K. (2006). Productive and reproductive performance of Sonadi sheep in their native tract. *Indian J Small Rumin.*, 13: 51-54.
[20] Vasundara Devi, M. (2013). Genetic evaluation of bandur sheep under field conditions. P.hD., Thesis, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar.