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# FACTORS AFFECTING SEX RATIO IN OSMANABADI GOAT IN VIDARBHA CLIMATIC CONDITION

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## ABSTRACT

*Data on birth of 182 Osmanabadi kids for the period of 6 years from 2011 to 2016 at Osmanabadi goat unit, Nagpur Veterinary College, Nagpur were analyzed to study the factors affecting the sex ratio in Osmanabadi goats. The male to female sex ratio was 56.59:43.41 %. The percentage of males was higher in the month of November, January, February, march and April whereas it was higher in female in the months of June, August, September and December. The sex of the kid was significantly affected by year and season. In Vidarbha climatic zone to get more male kids breeding management plays an important role.*

**Key words:** Twining, Osmanabadi goat, Vidarbha region, sex ratio.

## Introduction

Goats considered as one of the hardiest animals ever to be domesticated by man, are an important source of income and occupation to a sizeable population. It has the widest ecological

range. The overall efficiency of any goat breed is judged not only on the basis of milk, meat or fiber yield but also on the basis of their growth and development.

Out of the, 26 goat breeds found in India, four are from Maharashtra state i. e. Osmanabadi, Sangamneri, Kokan Kanyal and Berari. Osmanabadi goat is native breed of Marathwada region of Maharashtra, but the breed is reared, bred and well adapted throughout the Maharashtra state including Vidarabha region (Motghare et al., 2004). It has many desirable characteristics of meat breeds, such as high prolificacy, early maturity, high kidding rate with appreciable twinning percentage and better growth rate and quality meat. Lawar (1992) pointed out that the local goat (mainly Osmanabadi) is superior for multiple birth percentage than Angora or crossbred goats. It has been surveyed and subsequently noted that twining percentage in this breed is near about 75.00 percent and triplet is about 6-8 per cent (Koratkar,1999)

Nagpur is practically at geographical center of India, in fact the zero milestone of India is in this city. Nagpur is situated in between 210.07 north latitudes and 790.07 east longitudes. Nagpur is situated 274.5 mtrs to 652.70 mtrs above sea level and 28% of Nagpur is covered by Forest. Nagpur generally has a dry tropical weather. The climate of Nagpur follows a typical seasonal monsoon weather pattern. The peak temperatures are usually reached in May/June and can be as high as $48^0$C and lowest temperature 6 to $7^0$C in December and January.

Knowledge of sex ratio in breeding population helps in maximizing genetic gain by enhancing the intensity of selection. It is generally established that the sex ratio do not deviate significantly from 50%. Still there are some factors, which might influence on the deviation of the sex ratio. The kidding percentage and twinning ability are the most important parameters to investigate reproductive efficiency. It is measure of production and profit point of view in organized and unorganized sector of goat farming.

**Material and Methods**

The data on 182 birth of Osmanabadi kids for the period of 6 years from 2011 to 2016 at Osmanabadi goat unit, Nagpur Veterinary College, Nagpur was analyzed for this study. All goats were maintained under same feeding and management practices followed by strict prophylactic measures. The year was divided into three seasons (Summer = March-June; Monsoon=July-October; Winter=November-February). The type of birth were classified as single, twin. The

variation in the sex ratio due to year, season, month and type of birth were analyzed statistically (Snedecor and Cochran, 1967).

**Results and Discussion**

The year-wise male and female births are presented in Table-1. The results revealed that the differences between the years were significant (P<0.05). Out of 182 total birth recorded, 103( 56.59%) and 79 (43.41 %) were male and females, respectively. This was similar to findings of Kale and Tomar (1997) reported (54.56:45.55%) in Alpine x Beetal goats, Soundrarajan and Sivakumar (2006a) in Kanni Goats (57.71:42.29) and Sivakumar and Soundararajan (2007) in nondescript goats (55.43:44.57%). On the contrary, some workers were recorded nearly equal ratio of male female by Deokar et al. (2000) (50.61:49.39%) in Osmanabadi goats, Barbind et al. (2004) in Beetal x Osmanabadi goats (49.16:50.48%), Soundararajan and Sivkumar (2006b) in Tellicherry goats (51.81:48.19%) and Thiruvenkadan et al. (2008) in Tellicherry goats (51.1:48.9%). It is observed that the kidding percentage found to be higher during 2014 and 2011 however, lowest during 2012. Kidding percentage is important parameter which reflects the reproductive efficiency and having low heritability (0 to 0.15). However management plays an important role in increasing reproductive efficiency. The kidding percentage express during 2012, 2013 and 2016 might be due to some important managerial and climatic factors. The higher kidding percentage expressed during the year 2011 and subsequently in year 2014 indicated that the osmanabadi goat have potential to show better reproductive efficiency which could be optimized by providing excellent managerial practices.

Influence of season was found to be significant. Of the 182 Osmanabadi kids born, 75.82% were born during winter followed by 14.29% by summer and 9.89% during monsoon season (Table 2). This in accordance with that of Deokar et al. (2002) who has observed more births (49.19) during winter months in Osmanabadi goats and Soundrarajan and Sivakumar (2006a) reported more births (40.97%) during winter season in Kanni goats. The percentage of male was higher in winter and summer seasons with a maximum of 60.14% during winter season.

The percentage of male was higher in Twinning (63.64%) but the effect was not significant (Table 3). The non significant effect on type of birth was also reported by Poonia et al. (2009) in Beetal goats. The percentage of single kidding (51.65%) was higher than twinning

(48.35%) in Osmanabadi goats. The higher percentage of single kidding was also reported by Soundrarajan and Sivakumar (2006a) in Kanni goats. However, Sahare et al. (2009) reported 10.52% twinning in Osmanabadi goats.

The kidding percentage of male was higher in the month of January, February, March, April months 66.67, 63.89, 100 and 75% respectively. However kidding percentage in female was higher in June, August, September and December with 55.56, 72.73, 100 and 54.84%, respectively. (Table 4).

## Conclusion

The male to female sex ratio was 56.59:43.41%. The percentage of males was higher in the month of November, January, February, march and April whereas it was higher in female in the months of June, August, September and December. The sex of the kid was significantly affected by year and season. In Vidarbha climatic zone to get more male kids breeding management plays an important role.

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Table 1. Year wise sex ratio in Osmanabadi Goats.

| Sr. No. | Year | No. of Does | Total Birth | No. of Male | % | No. of Female | % |
|---|---|---|---|---|---|---|---|
| 1 | 2011 | 7 | 9 | 4 | 44.44 | 5 | 55.56 |
| 2 | 2012 | 25 | 30 | 20 | 66.67 | 10 | 33.33 |
| 3 | 2013 | 31 | 44 | 31 | 70.45 | 13 | 29.55 |
| 4 | 2014 | 21 | 28 | 8 | 28.57 | 20 | 71.43 |
| 5 | 2015 | 21 | 25 | 13 | 52 | 12 | 48 |
| 6 | 2016 | 33 | 46 | 27 | 58.7 | 19 | 41.3 |
| | Total | 138 | 182 | 103 | 56.59 | 79 | 43.41 |

Calculated chi-square value=14.5*

*Significant at P<0.05; NS= non significant

Table 2. Season wise sex ratio of Osmanabadi Goats.

| Sr. No. | Season | No. of does kidded | Birth | % of total Birth | No. of Male | % | No. of Female | % |
|---|---|---|---|---|---|---|---|---|
| 1 | Summer | 22 | 26 | 14.29 | 15 | 57.69 | 11 | 42.31 |
| 2 | Monsoon | 15 | 18 | 9.89 | 5 | 27.78 | 13 | 72.22 |
| 3 | Winter | 101 | 138 | 75.82 | 83 | 60.14 | 55 | 39.86 |
| | Total | 138 | 182 | | 103 | 56.59 | 79 | 43.41 |

Calculated chi-square value=6.806*

*Significant at P<0.05; NS= non significant

Table 3. Influence of type of birth on sex ratio in Osmanabadi Goats.

| Sr. No. | Sex | Single | % | Twin | % | Total |
|---|---|---|---|---|---|---|
| 1 | Male | 47 | 50 | 56 | 63.64 | 103 |
| 2 | Female | 47 | 50 | 32 | 36.36 | 79 |
| | Total | 94 | 51.65 | 88 | 48.35 | 182 |

Calculated chi-square value=$3.44^{NS}$

*Significant at P<0.05; NS= non significant

Table 4. Month wise sex ratio in Osmanabadi Goats.

| Sr. No. | Year | No. of does kidded | Total Birth | No. of Male | % | No. of Female | % |
|---|---|---|---|---|---|---|---|
| 1 | January | 18 | 27 | 18 | 66.67 | 9 | 33.33 |
| 2 | February | 27 | 36 | 23 | 63.89 | 13 | 36.11 |
| 3 | March | 3 | 3 | 3 | 100 | | |
| 4 | April | 3 | 4 | 3 | 75 | 1 | 25 |
| 5 | May | 8 | 10 | 5 | 50 | 5 | 50 |
| 6 | June | 8 | 9 | 4 | 44.44 | 5 | 55.56 |
| 7 | July | 6 | 8 | 4 | 50 | 4 | 50 |
| 8 | August | 9 | 11 | 3 | 27.27 | 8 | 72.73 |
| 9 | September | 1 | 1 | - | - | 1 | 100 |
| 10 | October | - | - | - | - | - | - |
| 11 | November | 32 | 42 | 26 | 61.9 | 16 | 38.1 |
| 12 | December | 23 | 31 | 14 | 45.16 | 17 | 54.84 |
| | Total | 138 | 182 | 103 | 56.59 | 79 | 43.41 |

\Calculated chi-square value=$14.62^{NS}$

*Significant at P<0.05; NS= non significant