Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; 8(2): 1594-1596

Received: 22-01-2020
Accepted: 24-02-2020

Suresh Kumar
PhD Scholar, Livestock Production Management Section, ICAR-NDRI Karnal, Haryana, India

Ramesh Chandra
Senior Scientist, Livestock Production Management Section, ICAR-NDRI Karnal, Haryana, India

Kedare Gopal Madhav
ICAR-National Dairy Research Institute, Karnal, Haryana, India

Corresponding Author:
Suresh Kumar
PhD Scholar, Livestock Production Management Section, ICAR-NDRI Karnal, Haryana, India

Analysis of factors affecting multiple births, abnormal kidding, litter size and sex ratio in Alpine Beetal goats

Suresh Kumar, Ramesh Chandra and Kedare Gopal Madhav

Abstract
The present investigation was conducted using 220 kidding records of Alpine Beetal goats to evaluate the influence of various factors on abnormal kidding, multiple birth, litter size and sex ratio. In this study, the abnormal kidding was 3.18%, twins 43.67%, triplets 8.18%, litter size 1.58 and sex ratio was 48.58% among normal kids. The rate of abnormal kidding was higher among single births than multiple births. Year of kidding had the significant (P<0.05) effect on abnormal kidding, twins, triplets and sex ratio. Season of kidding had the significant (P<0.05) effect on twins, triplets and sex ratio. However, kidding order had the significant (P<0.05) effect on sex ratio. Twinning percentage was significantly (P<0.01) higher (46.51%) in winter than in least kidding season (36.00%).

Keywords: Goat, kid, kidding, litter size, sex ratio

Introduction
Goat farming substantially contributes to the rural economy and provides livelihood security to the poor, small and marginal farmers of the society Hoque *et al*. 2002 [1]. Among the various breeds of goats, Alpine Beetal is one of the best dual-purpose goat breeds, best suited for arid to semi arid climatic conditions. Haryana is situated at 29º42'N latitude and 72º02'E longitudes at the altitude of 250 m above the mean sea level in the bed of Indo-Gangetic alluvial plain. Maximum temperature during summer in the area is near about 45 ºC and minimum temperature during winter is near about 2.0 ºC. Selection is an essential tool to increase genetic gain in the flock and it is important to increase the flock size by increasing the number of placement stock to take the advantage of culling. The litter size, abnormal kidding and sex ratio in goats influence the available number of replacement female in a flock Chaudhary *et al*. 2013 [2]. The information on litter size, abnormal kidding and sex ratio in Alpine Beetal goats are not available and hence the present study was made to investigate the various factors affecting on kidding pattern in Alpine Beetal goats.

Materials and Methods
The present study was conducted with the available 220 kidding record of Alpine Beetal goats maintained at Livestock Research Centre, National Dairy Research Institute, Karnal which is situated at 29º42'N latitude and 72º02'E longitudes at the altitude of 250 m above the mean sea level in the bed of Indo-Gangetic alluvial plain for the period from 2010-11 to 2014-15 under stall feeding system. Maximum temperature during summer in the area is near about 45ºC and minimum temperature during winter is near about 2.0 ºC. All goats were maintained under semi-intensive system. The data were classified based on year of kidding, season of kidding, type of birth and dam's kidding order. The year of kidding was divided into three season's viz. winter from November–February, summer from March-June and rainy from July-October. The data on abnormal kidding and sex ratios were classified into single and multiple births. The effects of dam's weight at service on abnormal kidding and multiple births were also studied. The effects of different non-genetic factors on these traits were analyzed by analysis of variance (Snedecor and Cochran, 1999) [3].

Results and Discussion
The data presented in Table 1 indicated that the incidence of single, twin and triplets were 48.18, 43.67 and 8.18 %. The incidence of twin births ranged among years from 26.92% to

53.85% and triplet births ranged from 7.58% to 13.15%. The twining percentage was highest in the year 2013-13 (53.85) and triplet percentage in the year 2011-12 (13.15). The lowest percentage in twining was 26.92 (2014-15) and in triplet 7.58 (2010-11). However, statistically it was observed that year of kidding had significant (P<0.05) effect on twin and triplet birth. Similar findings were reported by Tomer *et al*. 1995 [4] who observed significant effect of year on twin birth. Out of 220 total kiddings, 7 (2.72%) were abnormal kidding (abortion, still birth, dystocia). This was in agreement to the findings reported by Kumar *et al*. 2001 [5] in Marwari goats. A very high incidence of 32.50% abnormal kidding has been reported by Ananta *et al*. 2008 [6] in Black Bengal goats. The incidence of abnormal kidding significantly varied from 2.50 to 5.77% among in different years of birth. The year of birth had significant effect on litter size at birth. The overall litter size was 1.58, ranged from 1.40 (2012-13) to 1.82 (2011-12). The 220 kidding recorded during the study period revealed that the major kidding season was rainy in which 49.54% births take place followed by winter (39.69) and summer (11.36%). In contrast to this Chaudhary *et al*. 2013 [2] reported that the major kidding season was winter in which 48.95% births take place followed by summer (33.68%) and rainy (17.36%) seasons. Kumar *et al*. 2010 [7] also reported the major kidding season was winter, in which 45% of all births took place, followed by rainy and summer seasons (27% each). The season of kidding had highly significantly (P<0.01) effect on the abnormal kidding. It was observed that maximum abnormal kidding was found in rainy season. Litter size, does that kidding during the rainy season maintained litter size of 1.61 as compared to 1.60 in summer and 1.58 in winter. This result complies with several authors (Prakash and Singh, 1985; Hoque *et al*. 2002) [8, 1]. The frequencies of accumulated kiddings showed that 44% of births occurred in the rainy season against 28% respectively in the cool dry and hot dry seasons. The sex ratio expressed as the percentage of male births among the normal kids born and it was found to be 48.58%. The sex ratio has been reported as 52.14% in Sikkim local goats by Chandra and Karmakar 2011 [9]. Poonia *et al*. 2009 [10] reported 50.35% in Beetal goats. The sex ratio was significantly affected by year of birth and it was lowest (45.45%) in 2010-11 and highest (58.33%) in 2014-15. The male frequency was lower (42.65%) in winter season and higher in summer (52.50%). The frequency of male birth was higher (51.85%) in triplets followed by twins (50.51%) and lowest in single (43.40%) respectively. The frequency of male birth varied from 42.57% in 1st kidding to 54.84% in 3rd kidding. Statistical analysis of data showed that kidding order did not affect the sex ratio. This is accordance with that of Soundararajan and Shivkumar, 2011 [11] in Boer x Kanni crossbred goats and Prakash and singh, 1988 [8] also reported similar findings in Alpine and Saanen crossbred goats.

Table 1: Kidding pattern of Alpine Beetal goats

Effects	No. of kidding	Abnormal kidding	Single	Twins	Triplets	Total kids	Litter size	Sex ratio (Male birth)	
								No	%
Overall	220	7(3.18)	106 (48.18)	96 (43.67)	18 (8.18)	352	1.58	171	48.58
Year of kidding									
2010-11	66	6 (9.09)	27	34(51.52)	5 (7.58)	110	1.67	50	45.45
2011-12	38	-	13	20(52.63)	5(13.15)	68	1.79	32	47.06
2012-13	40	-	25	14(35.00)	1(12.5)	56	1.40	26	46.43
2013-14	26	-	9	14(53.85)	3(11.54)	46	1.77	21	45.65
2014-15	50	1 (1.92)	32	14(26.92)	4(7.69)	72	1.44	42	58.33
Season of kidding									
Winter	86	3 (3.49)	41	40(46.51)	5(5.81)	136	1.58	58	42.65
Summer	25		13	9(36.00)	3(12.0)	40	1.60	21	52.50
Rainy	109	4 (3.67)	52	47(43.12)	10(9.17)	176	1.61	92	52.27
Type of birth									
Single	106	4 (3.77)	106	-	-	106	1.0	46	43.40
Twin	96	2 (2.08)	-	96	-	192	2.0	97	50.51
Triplet	18	1 (5.56)	-	-	18	54	3.0	28	51.85
Kidding order **									
1	63	6 (9.52)	30	28(44.44)	5(7.94)	101	1.60	43	42.57
11	58	1 (1.72)	28	25(43.10)	5(8.62)	93	1.60	47	50.54
111	39	-	19	17(43.59)	3(7.69)	62	1.59	34	54.84
1V	31	-	15	14(45.16)	2(6.45)	49	1.58	25	51.02
V	19	-	9	8(42.11)	2(10.53)	31	1.63	15	48.39
V1	10	-	5	4(40.00)	1(10.00)	16	1.60	7	43.75

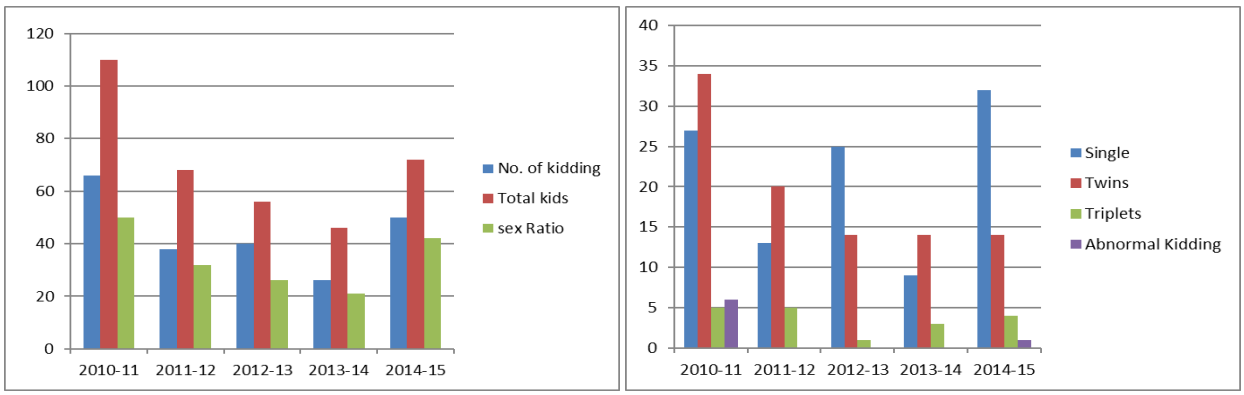

Fig 1-2: Year wise pattern of No. Of kidding, total kids and sex ratio (Fig 1) and year wise pattern of single, twins, triplets and abnormal kidding (Fig 2) { X axis- Years and Y axis – Parameters}

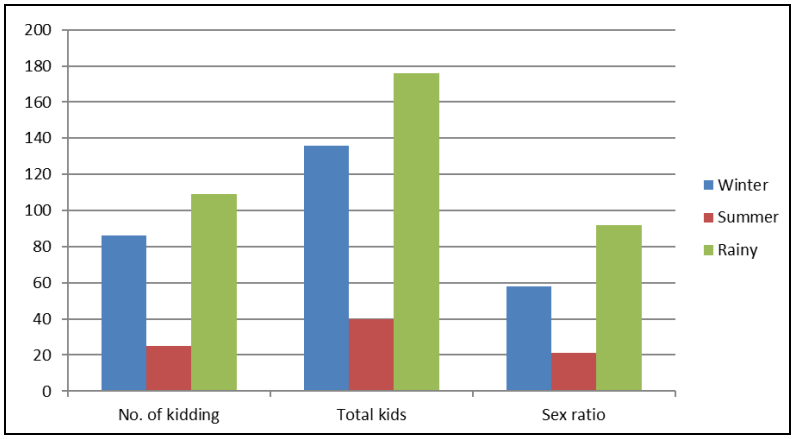

Fig 3: Season wise pattern of No. Of kidding, total kids and sex ratio (X axis- Parameters and Y axis – Numbers)

Conclusion

From this study it may be concluded that year and season of kidding affects the abnormal kidding, twins, triplets and sex ratio. Thus, by improving the managemental conditions optimum returns can be obtained by the goat farmers.

Conflict of interest: The authors declared that there is no conflict of interest.

Acknowledgement

The authors are highly thankful to ICAR-National dairy research institute for carrying out the research work.

References

1. Hoque MA, Amin MR, Baik DH. Genetic and Non-genetic Causes of Variation in Gestation Length, Litter Size and Litter Weight in Goats. Asian-Aust. Journal of Animal Science. 2002; 15:772-776.
2. Chaudhary H, Raghunandan T, Gnana PM. Effect of season on kidding and birth weight in Osmanabadi goats reared in an organized farm. International Journal of Livestock Research. 2013; 3:84-88.
3. Snedecor GW, Cochran WG. Statistical methods. 8th edn, Iowa State University Press, Ames, Iowa, USA-50010, 1999.
4. Tomar SS, Singh RB, Sharma RC. Effect of cross breeding and other factors on multiple births, abnormal kidding and sex ratio in dairy goats. Indian Journal of animal Research 1995; 29:105-111.
5. Kumar A, Tomer AKS, Kumar A, Mehta BS. Factors affecting multiple birth, abnormal kidding, litter size and sex ratio in Marwari goats. Indian Journal of Animal Research 2001; 35:59- 61.
6. Ananta KD, Manna MK, Sahoo AK, Deb R, Paul PK. Studies on reproductive traits of Bengal goats in a part of West Bengal. Indian Journal of Small Ruminants 2008; 14:259-261.
7. Kumar A, Maity SB, Kushwaha BP, Mahanta SK. Effect of season on kidding and birth weight in Bundelkhandi goats. Indian Veterinary Journal. 2010; 87:378-379.
8. Prakash B, Singh B. Factors affecting multiple births and their crosses with Alpine and Saanen breeds. Indian Journal of Animal Production and Management 1985; 1:177-179.
9. Chandra R, Karmakar HD. Kidding pattern in Sikkim local goats. Indian Veterinary Journal. 2011; 88:39-40.
10. Poonia JS, Malik B, Khanna AS. Factors affecting sex ratio in beetal goats. The Indian Journal of Small Ruminants. 2009; 15:268-270.
11. Soundararajan C, Shivkumat T. Factors affecting birth weight of Kanni kids and sax ratio of Boer x Kanni crossbred goats. Tamilnadu Journal of Veterinary & Animal Sciences. 2011; 7:144-149.