

Oestrus characteristics in Jakhrana goats

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Received : June 11, 2001
Accepted : February 5, 2002

ABSTRACT

Study on oestrus characteristics (oestrus symptoms and duration) at different physiological stages was conducted in two hundred eighty two (pubertal: 90, post-pubertal: 20, and post-partum: 172) Jakhrana goats, maintained under semi-intensive system of management at experimental sheds of this institute. Oestrus detection was carried out at 6-12 hours interval. Behavioural oestrus symptoms (moderate) were observed at puberty while goats at first post-partum oestrus expressed behavioural oestrus of weak intensity. Post-pubertal (nulliparous and parous) goats exhibited typical oestrus symptoms. Oestrus duration in pubertal goats averaged 27.97 ± 1.43 hr (range: 12 to 60 hr) and majority of goats remained in oestrus for 24 to 36 hr. Type and season of birth did not influence its duration ($P > 0.05$). In post-pubertal goats oestrus duration averaged 29.28 ± 0.98 hr (nulliparous: 28.40 ± 1.26 , parous: 30.26 ± 1.53 hr) and majority of goats remained in oestrus for 19 to 36 hr. Incidence of short (6-18 hr), long (37-48 hr) and very long (>48 hr) oestruses was also noticed. In post-partum goats, first oestrus averaged 25.25 ± 0.88 hr (range: 12 to 60 hr) and majority (64%) of goats remained in oestrus for 24 to 36 hr. Goats kidded during Dec.-Jan. had highest (28.50 ± 1.77 hr) and those kidded during April had lowest (17.14 ± 2.42 hr) post-partum oestrus duration ($P < 0.05$). The difference in oestrus duration among different physiological stages was statistically non-significant ($P > 0.05$) and majority of them remained in oestrus for 24 to 36 hr. Information on oestrus symptoms and duration will help to mate Jakhrana goats at proper time for optimum flock fertility.

Key words : Oestrus symptoms, duration, physiological stages, Jakhrana goat

In goats similar to other livestock species, sexual receptivity/behaviour of the female is limited to a short period classically its 'oestrus', the period of desire. This sexual behaviour is hormonal dependent and their secretion and action are essential for its triggering and expression. An oestrous doe attracts the male and accepts mounting. Quantification of these determines the onset and termination of oestrous behaviour in cyclic females and the onset and end of the sexual season in seasonal breeders. Additionally goats exhibit other external signs, which are more or less perceptible, depending on breeds or individuals in association with oestrous behaviour. Such information is helpful in deciding proper mating period to get optimum flock fertility.

Information on oestrous characteristics at different physiological stages is meagre in Jakhrana goats. The present study deals with oestrous symptoms and

oestrus duration in this tropical goat breed of semi-arid zone of India.

MATERIALS AND METHODS

The study was undertaken in Jakhrana goats of different physiological stages. They were maintained under semi-intensive system of management and were grouped as under.

Pubertal group: Ninety female kids born between Oct. 1986 and Oct. 1994 were considered for this study. Oestrus detection was started at 6 months of age. Oestrus was detected at 12 hourly intervals by using a vasectomized teaser buck, which was allowed to run with female kid for half an hour in a closed pen. The behavioural oestrus symptoms like vulvar oedema, discharge of cervical mucus, wagging of tail, frequent urination and buck mounting etc. were noticed. On attainment of puberty.

They were included in the study. The time of onset of behavioural oestrus was taken as mid-way between the last negative and first positive acceptance

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of teaser buck, likewise the end of the oestrus was taken as mid-way between the last positive and first negative acceptance. Thus the duration of pubertal oestrus was determined on the basis of difference between these two periods. Similar criteria were adopted in other groups to calculate oestrus duration. Parameters related to pubertal oestrus were analysed to study the effect of season & type of birth on oestrus duration by using least-squares techniques (Harvey, 1975). Season of birth was classified as season I (Mar.-May) & season II (Oct.-Dec.).

1. Post-partum group: One hundred seventy two healthy does kidded between October 1986 and March 1995 was considered for this study. Does were provided supplementary feeding for 90 days post-kidding. Regular oestrus detection with the help of a vasectomized teaser buck was practiced at 12 hourly interval. The does expressed oestrus first time after kidding (first post-partum oestrus) was identified and data were recorded. They were closely observed for behavioural signs of oestrus till it was over. CRB design of analysis was used to evaluate the influence of month of kidding, parity, type of birth and sex on oestrus duration.

2. Post-Pubertal (Parous and non-parous) group: Twenty adult cyclic (nulliparous and parous: 10 each) goats were used for this study. Regular oestrus detection with the help of a vasectomized teaser buck was carried out at 6 hourly interval (5 a.m., 11 a.m., 5 p.m. and 11 p.m.) for one year. The behavioural symptoms were noticed and recorded to determine onset and cessation of oestrus. Goats were not bred during the period of study. The parameters related to oestrus were statistically analyzed by using CRB design of analysis and chi-square (X²) test. Criteria described by Akusu and Egbunike (1990) with certain modifications was adopted to classify

the oestrus duration: 6 to 18 hr, medium oestrus duration: 19 to 36 hr, long oestrus duration: 37 to 48 hr, and very long oestrus duration: above 48 hr.).

RESULTS AND DISCUSSION

1. Pubertal: Typical (Behavioural) oestrus symptoms of moderate intensity were observed in goats at puberty. Majority of goats (63, 70%) exhibited oestrus ranging from 24-36 hr (overall range: 12-60 hr). The least-squares mean of oestrus duration was 27.97 ± 1.43 hr (Table 1). Analysis of variance revealed a non-significant ($P > 0.05$) effect of type and season of birth on pubertal oestrus duration. On perusal of literature oestrus duration was comparable with other goat breeds (Sahni and Roy, 1967; Mittal and Ghosh, 1985; Mittal, 1988) of Indian origin.

2. Post-partum: The goats exhibiting first post-partum oestrus, though expressed important behavioural symptoms of oestrus but their intensity in majority of goats was of weak nature. Majority of goats (110, 64%) exhibited oestrus ranging from 24-36 hr., (overall range: 12-60 hr). The average oestrus duration was 25.25 ± 0.88 hr (Table 1). Analysis of variance (Table 2) revealed significant effect of month of kidding on post-partum oestrus duration. It was highest (28.50 ± 1.77 hr) in goats kidded in December-January and lowest in those kidded in April (17.14 ± 2.42 ; Prasad, 1979; Singh *et al.*, 1986).

3. Parous and non-parous group: Adult (nulliparous and parous) goats exhibited typical oestrus symptoms. Oestrus was more intense in parous goats. Oestrus symptoms noticed were; *frequent wagging of tail, *tendency to cluster round the buck and allowing him to tease and mount, *drop in milk yield in lactating goats, *frequent urination, *tendency to tease other oestrous or non-oestrous goats. *swollen vulva with thin

Table 1. Frequency distribution of oestrus duration

Interval (hr)	Pubertal		Post-partum	
	Number of animals	Percentage	Number of animals	Percentage
12	16	17.78	47	27.32
24	40	44.45	80	46.51
36	23	25.56	30	17.44
48	8	8.88	10	5.81
60	3	3.33	5	2.96
Total	90 (Av. 27.97 ± 1.43 hr)		172 (Av. 25.25 ± 0.88 hr)	

Table 2 Analysis of variance for various factors affecting post-partum oestrus duration in jakhrana goats

Source of Variation	D.F.	M.S.S. Oestrus duration
Month	8	281.87*
Parity	1	8.25
Type of birth	2	2.18
Sex	1	33.47
Error	159	130.34

*P<0.05

Table 3. Pattern of oestrus duration in jakhrana goats

Pattern (hr)	Nulliparous		Parous		Pooled	
	No.	%	No.	%	No.	%
Short (6-18)	15	20.00	13	19.12	28	19.58
Medium (19-36)	51	69.00	42	61.76	93	65.04
Long (37-48)	5	6.67	9	13.23	14	9.79
Very long (>48)	4	5.33	4	5.88	8	5.59
Total	75		68		143	

watery secretions from vagina during early oestrus. It was mucinous during mid-oestrus and thicker towards late oestrus. Occasionally during late oestrus vasectomized teaser buck did not mount the oestrous goats though tail wagging continued. Similar oestrus symptoms were observed in (parous and non-parous) Jakhrana goats and these were almost identical with most goat breeds of Indian origin, specially of semi-arid region (Prasad and Pandey, 1981; Mittal and Ghosh, 1985; Mittal, 1988) and other tropical goats (Banumathi and Mukherjee, 1981; Molokwu and Igono, 1982; Jalaluddin, 1992). Oestrus duration ranged from 19-36 hr in 65% goats, while the frequency of short (6-18 hr), long (37-48 hr) & very long (>48 hr) was 20, 10 and 5%, respectively. The over all range of oestrus duration was 6 to 60 hr. Mean duration of standing duration was 29.28 ± 0.98 hr, with 28.40 ± 1.53 hr in Nulliparous and parous goats, respectively. Parity and oestrus onset time did not affect ($P > 0.05$) oestrus duration. In majority of goats oestrus duration ranged from 19 to 36 hours (Table 3).

Frequency of oestrus duration observed in this study is in the line of other tropical goats (Banumathi and Mukherjee, 1981; Prasad and Pandey, 1981; Akusu and Egbunike, 1990). Mean duration of oestrus in this study is comparable with other tropical goats (Sahni and Roy, 1967; Mittal and Ghosh, 1985; Mittal, 1988; Sah and Rigor, 1985; Akusu and Egbunike, 1990). There was no significant difference ($P > 0.05$) in mean oestrus duration in animals of different physiological groups.

The results indicated that Jakhrana goats (irrespective to their physiological stages) remained in oestrus more than a day (28 hr). Information on oestrus duration and symptoms investigated for this breed will help in deciding its appropriate mating time. Based upon present findings it is recommended to bred Jakhrana initially 12 hr after the onset of oestrus, followed by second mating/ insemination at 12 hr interval.

ACKNOWLEDGEMENT

Authors are thankful to the Director of the Institute for providing necessary facilities to undertake this work.

REFERENCES

- Akusu, M.O. and Egbunike, G.N. 1990. Effects of oestrus duration of West African Dwarf goats. *Small Rumin. Res.*, 3: 413-418.
- Banumathi, T. and Mukherjee, T.K. 1981. Oestrous cycle and associated phenomena in Katjang goats. *Malayas. Vet. J.*, 7: 58-63.
- Harvey, W.R. 1975. Least-squares analysis of data with unequal subclass number. ARS 20 USDA, Beltsville, Maryland, USA.
- Jalaluddin, A. 1992. Reproductive pattern of Black Bengal goats. Pre. Conf. Proc. (Vol. I) 5th Intern. Conf. Goats. New Delhi, March 2-8, 324 pp.
- Mittal, J.P. 1988. Breed characteristics of Marwari goat of arid Western Rajasthan. *Indian J. Anim. Sci.*, 55 (8): 357-361.
- Mittal, J.P. and Ghosh, P.K. 1985. Characteristics of Parbatsar breed from Rajasthan Desert. *Indian J. Anim. Sci.*, 55 (8): 673-678.
- Molokwu, E.C.I. and Igono, M.O. 1982. Reproductive cycle of the Nigerian Savanna Brown goat. Proc. III Intern. Cong. Goat Proc. Disease, Tucson, Arizona, USA, Jan. 10-15, 312 pp. (Abstr).
- Prasad, S.P. 1979. A note on the characteristics of post-partum oestrus in Barbari nannies. *Indian J. Anim. Sci.*, 49 (7): 583-585.
- Prasad, S.P. and Pandey, M.D. 1981. Observations on sexual activity and foetal membranes in Barbari nannies. *Indian Vet. J.*, 58: 380-387.
- Sahni, K.L. and Roy, A. 1967. A study on the sexual activity of the Barbari goat (*Capra hircus*) and conception rate through A.I. *Indian J. Vet. Sci. A.H.*, 37(4): 269-276.
- Sah, S.K., Rigor, E.M. 1985. Estrous cycle, estrus duration and ovulation time in goats. *Phil. Agri. Univ. Philippines*, 68: 461-470.
- Singh, D.K., Singh, R.A., Sinha, M.P. and Singh, C.S.P. 1986. Post-Partum oestrus in Black Bengal goats. *Indian J. Anim. Sci.*, 56(2): 232-234.

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