

Estrus pattern and conception rate in postpartum lactating Ongole (Zebu) cows*

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ABSTRACT

A total of 131 parous lactating cows were observed for postpartum ovarian activity and other estrual events from day 15 postpartum. Observable estrus was noticed in 64.12 and 35.89 per cent of cows before day 60 (16 - 60) and beyond day 60 (61 -165), respectively. The mean time interval from calving to first postpartum onset of estrus was found to be 59.76 ± 2.81 days. The incidence of estrus was observed to be more (61.83%) during night (6 PM to 6 AM). The other estrual events viz estrus duration and estrous cycle length were 15.54 ± 0.28 hr and 22.67 ± 0.56 days, respectively. The conception rate at first AI was 42.74% with an overall fertility of 90%. The time interval from calving to conception (SP) and number of AI's required per conception were 113.52 ± 5.62 (21 - 346) days and 2.42 ± 0.11 (1-6), respectively.

Key words: Ongole cow, post partum estrus, conception rate.

India is the treasure house of *Bos indicus* breeds (Littlewood, 1936 and Narendranath, 1997). Ongole (Nelore in Brazil) cattle by virtue of their adaptability traits, superior production capacity under harsh tropical conditions, are very much sought after animals in tropical cattle production (FAO, 1953; Murari, 1965 and Ready, 1925). However, certain reproductive impediments like long service period (241 days, Venkateswarlu, 1971), calving interval of 528-530 days (Katpatal, 1990) and 528 ± 8.5 days (Acharya and Bhat, 1990), short estrus duration, incidence and cessation of estrus at night (Pinheiro *et al.*, 1998 and Rao *et al.*, 1977) and postpartum anestrus are limiting the economic use of this cattle breed. Knowledge of estrus behavior is essential for estimating the best time for artificial insemination in cattle. Hence, in this paper estrus pattern and conception rates studied in postpartum lactating Ongole cows are presented.

MATERIALS AND METHODS

The present Study was undertaken at cattle project, Livestock Research Station, Lam Farm, Guntur.

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The postpartum lactating Ongole cows were kept under observation for estrus detection using a teaser and visual observation at 4 hr interval. The estrus pattern parameters including the time interval from calving to first standing estrus, incidence of estrus (day / night), estrus behavior (intense, normal and weak), duration of estrus, conception rate, number of services per conception and service period were recorded. The time interval from calving to appearance of first estrus was observed and classified as cows exhibiting estrus in less than 60 and beyond 60 days. Intensity of estrus was classified as intense, normal and weak according to the method of Rao and Rao (1981) with much emphasis on mucus discharge. Duration of behavioral estrus was estimated in hours from the time of first acceptance of teaser to refusal of teaser. Cows in estrus were inseminated using frozen semen from bulls of known fertility of this project at 8 to 12 hours after the onset of estrus. The cows that did not conceive at first estrus were observed for subsequent estrus and inseminated. The length of estrous cycle was studied by considering the period between two successive estruses and was classified as less than 17, 18-25 (normal) and more than 26 days. The conception rate was calculated as percentage of cows conceived at first, second, third and above of the total inseminations. The number of

services required per conception and the service period (interval from calving to conception in days) was recorded. The data was analyzed as per the Snedecor and Cochran (1989).

RESULTS AND DISCUSSION

Out of 131 postpartum cows, 64.12% (84 of 131) cows exhibited estrus within day 60 (Table 1), remaining (35.88%) cows showed estrus beyond day 60 postpartum. In the present study, the postpartum onset of estrus was highly variable and ranged from 16 - 165 days with a mean value of 59.76 ± 2.81 days (Table 2). However, parity had no effect ($P > 0.05$) on the onset of estrus. These results are in close agreement with the observations made by Feo *et al.* (1982) and Henao *et al.* (2000) in Nelore and Brahaman cows, respectively. The present mean interval to estrus of 59.76 ± 2.81 days is less than 67.04 ± 2.26 and 94.2% (18-223) days reported by Rao *et al.* (2001) in postpartum lactating Ongole cows. The shorter interval might be due to better reproductive management, periodic monitoring of reproductive health and ovarian activity of postpartum cows and use of teaser bull twice daily for prompt detection of estrus. In the present study 38.16 and 61.83% cows, estrus commenced during the day and night time, respectively. The present findings are similar to the findings reported by Pinheiro *et al.* (1998) in Nelore cows in Brazil, Solano *et al.* (1982) Zakari *et al.* (1981) in zebu cows. Only 19.08 and 17.55% of cows exhibited intense or weak and the remaining 63.30% showed normal estrus. Less overt estrus symptoms in *Bos indicus* females were attributed to smaller corpus luteum and lower progesterone levels (Macfarlane, 1991 and Plasse *et al.*, 1970). The mean estrus duration recorded in this study was 15.54 ± 0.28 hr (table 2) longer than the duration of normal estrus in Nelore (Ongole) cows reported by Valle *et al.* (1994) and Figueiredo *et al.* (1997). This difference might be due to the methods used for estimation of estrus duration, age and parity. Estrus duration observed in this study is similar to the observations made by Solano *et al.* (1982) and Martinez *et al.* (1984) in zebu cows. In the present study, the estrous cycle length of 18-25 days was observed in 79.45% cows and the remaining cows showed 11-17 (5.48%) more than 26 days (15.07%) (table 1). The short

cycles of less than 17 days duration might be explained by short luteal phase. Other reasons for long cycles are post service acyclicity due to stress factors like high milk production. Parity had no effect ($P > 0.05$) on the estrous cycle length. The mean estrous cycle length (22.70 ± 0.56) recorded in the present study (table 2) is in agreement with Rao *et al.*, 1977 and Figueiredo *et al.*, 1997 in Ongole cows.

In the present study, 42.74, 32.82 and 14.50% cows required one, two and three and above artificial inseminations (table 1) for conception. The conception rate (42.74%) at first AI was in close agreement with the findings of Rao *et al.* (2001) in Ongole cows. However, much higher rate of conception was reported by Rao and Venkataramaiah (1990) in Ongole cows. The difference in conception levels might be due to differences in cow fertility, (Esselmont, 1985) and location specific managemental practices. In the present study, the mean number of services required per conception was 2.42 ± 0.11 (table 2). Cows of third and fourth parity required less number of services per conception than first, second and fifth parity cows, which might be due to lactation, stress in these parity of cows. These findings are in close agreement with the findings of Rao *et al.* (2001). Marginally lesser values were reported by Rao and Venkataramaiah (1990). In the present investigation, the mean time required for conception after calving was recorded as 113.52 ± 5.62 (21 -397) days, with significant difference among the parities (Table 2). The first, second and fifth parity cows needed longer time than the third and fourth parity cows. This difference could be due to lactation stress in younger animals. The service period observed in the present study was less than the previous reports (Acharya & Bhat 1990; Rao *et al.*, 2001; Ravi Kiran *et al.*, 1995; Venkateswarulu, 1971). The differences might be due to the location, parity and season.

In conclusion, post partum onset of estrus was found to be 59.76 ± 2.81 days. The incidence of estrus was more during night with 15.54 ± 0.28 hr of estrus duration. The estrous cycle length was 22.67 ± 0.56 days with 42.74% conception at first AI. The mean time interval from calving to conception and number of services required per conception was 113.52 ± 5.62 days and 2.42,

Table 1: Post partum estrus pattern and conception in lactating Ongole cows.

Parameters																						
Onset of estrus (days)				Duration of estrus (hours)				Estrous cycle length (days)						Conception rate (%) at			Service period (days)					
< 60		> 60		Up to 15		> 15		< 17		18 - 25		> 26		First AI	Second AI	Third AI	< 60		61 - 90		> 90	
N	%	N	%	N	%	N	%	N	%	N	%	N	%	%	%	%	N	%	N	%	N	%
84	64.12	47	35.89	115	87.78	16	12.22	4	5.49	58	79.45	11	15.07	42.74	32.82	14.5	34	25.95	20	15.77	64	48.85

Table 2: Reproductive performance of postpartum lactating Ongole cows (Mean interval from calving to first estrus (days), fertile estrus (SP days), fertility level (CR %) in relation to parity)

Parity	No. of cows (n)	Onset of first estrus	Estrus duration (Mean ± SE hours)	Estrous cycle length (Mean ± SE days)	Service Period (Mean ± SE Days)	Fertility level (CR %)				AI Index
						First AI	Second AI	Third and above AI	Overall	
1	29	63.41 ± 6.90 (25-165) -29	15.41 ± 0.64 (12-23)	23.48 ± 1.40 (16-42)	133.24 ± 14.37b (37-307) -25	41.38 (12/29)	34.48 (10/29)	10.34 (3/29)	86.24 (25/29)	2.68 ± 0.29
2	18	60.88 ± 5.66 (30-101) -18	14.72 ± 0.68 (12-21)	22.66 ± 1.61 (16-40)	123.55 ± 7.60b (31-171) -16	38.88 (7/18)	44.44 (8/18)	5.55 (1/18)	88.88 (16/18)	2.61 ± 0.25
3	14	59.71 ± 6.70 (16-160) -14	16.14 ± 0.81 (12-22)	22.78 ± 1.52 (17-42)	90.71 ± 8.59a (22-117) -14	50 (7/14)	28.58 (4/14)	21.42 (3/14)	100 (14/14)	1.64 ± 0.24
4	14	50.00 ± 5.21 (31-100) -14	16.78 ± 0.95 (12-22)	23.71 ± 2.09 (16-42)	91.92 ± 12.73a (31-107) -14	42.8 (6/14)	28.57 (4/14)	28.57 (4/14)	100 (14/14)	2.28 ± 0.26
5 and above	56	56.76 ± 4.09 (23-154) -56	15.42 ± 0.44 (12-22)	22.03 ± 0.74 (15-42)	122.07 ± 9.36b (21-346) -49	42.86 (24/56)	30.36 (17/56)	14.28 (8/56)	87.5 (49/56)	2.46 ± 0.19
Over all	131	59.76 ± 2.81 (16-165) -131	15.54 ± 0.28 (12-23)	22.67 ± 0.56 (15-42)	113.52 ± 5.62 (21-346) -118	42.74 (56/131)	32.82 (43/131)	14.5 (19/131)	90 (118/131)	2.42 ± 0.11

respectively.

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