Egypt. J. Anim. Prod. 23, No. 1-2, pp. 27-32(1983)

Post-Partum Oestrus Interval of Nili-Ravi Buffaloes in Pakistan

N. Ahmad, R. Ahmad Chaudhry* and **W. Ahmad**

* *Department of Animal Breeding and Genetics, University of Agriculture, Faisalabad (Pakistan).*

DATA pertaining to records of 1,410 post-partum oestrus intervals for the Nili-Ravi Buffaloes maintained at the Livestock Experiment Station, Qadirabad, District Sahiwal (Pakistan), during the years 1965-78, showed that the post-partum oestrus interval ranged from 10 to 663 days, the average being 128.69 days. The proportion of females coming into oestrus up to 30, 31-60, 61-90, 91-120, 12-150 and more than 150 days post-partum was 7.16, 22.48, 18.79 12.41, 8.16 and 31.00 per cent respectively. When the data were grouped according to month of calving, the longest average post-partum oestrus interval of 187.04 days was recorded for buffaloes calving in March while the shortest average of 85.49 days was observed for animals calving in September, the difference being significant ($P<0.01$). When the data were splitted in accordance with season of calving, the post-partum oestrus intervals of buffaloes calving during spring, summer, autumn and winter averaged 174.60, 124.65, 14.74 and 151.57 days, respectively, the difference being significant ($P<0.01$). It was concluded that buffaloes calving during normal season exhibited the first post-partum oestrus at significantly shorter intervals than those calving during other seasons.

Post-partum oestrus interval is a useful mean of reproductive efficiency of a female. A delayed post -partum oestrus increases the length of service period which, in turn, prolongs the length of calving interval. This results in a reduction of productive period of an animal's life. Thus, to minimize the unproductive period and to have enhanced calf crops during the life time of an animal, reduction in the length of post-partum oestrus interval is necessary. In buffalo, however, no information is available on this important parameter under Pakistan conditions. Therefore, the present study was undertaken to determine the length of post-partum oestrus interval of Nili-Ravi buffaloes. Attempt was also made to investigate the effect of month and season of calving on this parameter.

Material and Methods

Data for the records of 1, 410 post-partum oestrus intervals of Nili-Ravi buffaloes kept at the Livestock Experiment Station, Qadirabad, District Sahiwal* (Pakistan), for the period from 1965 to 1978,were utilized in this study.

For heat detection, these animals were regularly teased during morning and evening by vesectamised bulls. Months of years were grouped into four seasons, namely spring (February-April), summer (May-July), autumn (August-October) and winter (November-January). The data were split according to various months and seasons of calving. The analysis of variance was carried out to determine the magnitude of difference in the length of post-partum oestrus intervals due to various months and seasons of calving in buffaloes (Snedecor, 1962). Duncan's multiple range test was applied for comparison between the means of post-partum oestrus intervals as observed in various months and seasons of the year (Duncan, 1955).

Results

Data for 1, 410 post-partum oestrus intervals showed that the interval from parturition to first oestrus ranged from 10 to 663 days, the average being 128.69 days. In 7.16 % buffaloes, post-partum oestrus was observed at an interval up to 30 days whereas 61.84 animals showed the post-partum oestrus between 31 and 150 days . For 31 % buffaloes the interval was more than 150 days (Table 1).

TABLE 1. **Frequency distribution for the length of post-partum oestrus interval of baffaloes.**

Post-partum oestrus interval (days)	Frequency %	Cumulative frequency %
Up to 30	7.16	7.16
31 — 60	22.48	29.64
61 — 90	18.79	48.43
91 — 120	12.41	60.84
121 — 150	8.16	69.00
151 — 180	5.82	74.82
181 — 210	5.30	79.85
211 — 240	4.75	84.60
241 — 270	4.11	88.71
27 — 300	3.48	92.19
Above 300	7.81	100.00

* This region is situated at an altitude of about 173 M and lies between longitudes 73° ane 14° E and altitude 30° and 31. 15° N. The ambient temperature during summer ranges from 31 to 47°. While in winter it varies from 13 to 33°. The day length is the longest in June (about 14 hr), while the shortest is in December (about 10 hr). The annual rainfall ranges from 177.5 to 370 0 mm which usually comes in the monthc of July, August and January.

When the data were grouped according to month of calving, the longest average interval of 178.04 days was recorded for buffaloes calving during March followed by 174.18 days for animals calving in January. The shortest interval of 85.40 days was observed for animals calving in Septemder. The frequency and average length of post-partum oestrus interval of buffaloes calving during various months are shown in Table 2.

TABLE 2. **Frequency and average length of post-partum oestrus interval of buffaloes calving during various months in a year.**

Month of calving	Post-partum oestrus intervals	
	Frequency	Average length (days)
January	66	174.18
February	55	172.29
March	83	178.04
April	55	171.72
May	42	128.00
June	115	134.85
July	170	116.93
August	237	115.32
September	192	85.40
October	167	111.96
November	118	135.42
December	110	155.35

The analysis of variance (Table 3) revealed that differences among post-partum oestrus intervals of buffaloes calving during various months were significant ($P<0.01$).

To obtain a more precised information regarding seasonal variations in post-partum oestrus interval, the data were regrouped according to seasons of calving (Table 4). When classified on this basis, the longest average post-partum oestrus interval of 174.60 days was recorded for buffaloes that calved during spring whereas the shortest average interval of 104.74 days was observed for autumn calvers. The post-partum oestrus intervals for winter and summer calvers averaged 151.57 and 124.65 days, respectively.

TABLE 3. **Analysis of variance for the effect of month of calving on the length of post-partum oestrus interval of buffaloes.**

Source of variation	d.f.	S.S.	M.S.	F. Ratio
Months . . .	11	1105420.14	100492.74	11.85**
Error	1398	11858007.30	8482.12	
Total	1409	12963427.44		

** = Significant at 0.01 level.

TABLE 4. **Frequency and average length of post-partum oestrus interval of buffaloes calving during various seasons in a year.**

Season of calving	First post-partum oestrus intervals	
	Frequency	Average length (days)
Spring	193	174.60
Summer.	327	124.65
Autumn.	596	104.74
Winter	294	151.57

TABLE 5. **Analysis of variance showing effect of season of calving on length of post-partum oestrus interval of buffaloes.**

Source of variation	d.f.	S.S.	M.S.	F. Ratio
Seasons . . .	3	907976.67	302658.89	35.30**
Error	1406	12055450.77	8574.29	
Total	1409	12963427.44		

** = Significant at 0.021 level.

The analysis of variance (Table 5) revealed significant differences (P0.01) in the length of post-partum oestrus interval due to season of calving. Further analysis showed that the differences between intervals of buffaloes calving during Spring and Summer, Spring and Autumn, Spring and Winter, Summer and Autumn, Summer and Winter and Autumn and Winter were significant.

Discussion

In the present study, the post-partum oestrus interval ranged between 10 and 663 days, the average being 128.69 days. The proportion of buffaloes coming into oestrus up to 30, 31-60, 61-90, 91-120, 121-150 and more than 150 days post-partum was 7.16, 22.48, 18.79, 12.41, 8.16 and 31.00 per cent, respectively. These results are supported by the findings of El-Fouly *et al.* (1977) that for 86 Egyptian buffaloes the interval from parturition to first mating averaged 125.67. 9 days. Rao *et al.* (1973) also observed an average post-partum oestrus interval of 125.75 days,ranging from 21 to 349 days. The average post-partum oestrus interval of 131.5 and 77.9 days, for suckled and hand -milked buffaloes, respectively, were reported by El-Fouly *et al.* (1976b). El-Wishy (1979), however, reported that for 71 intervals to first post-partum oestrus, the average length was 72.7 days, the range being 10 to 308 days : for 73.2 % cases, this interval was up to 90 days. Similarly, the average post-partum oestrus interval of 55.10 and 87.3 days were reported by Pargaonkar and Kaikini (1974) and Butchaiah *et al.* (1975), respectively. El-Sheikh and Mohamed (1976) reported that the proportion of females coming into oestrus up to 30, 31-90, 91-150, 151-210, 211-270 or more than 270 days post-partum was 11.77, 36.28, 18.62, 5.88, 4.90 and 22.55 % respectively.

In the present study, a significant effect of month and season of calving on post-partum oestrus interval was observed. The shortest intervals were exhibited by September calvers while the longest by March Calvers. Rao *et al.* (1973) observed the shortest post-partum oestrus interval of 63.00 days for October calvers and the longest of 229.33 days for February calvers. Seasonal means were reported to be 156.44 (Winter), 142.35 (Summer) and 78.39 (monsoon) days, the differences being significant. In Egypt, El-Sheikh and Mohamed (1976) reported the average post-partum oestrus interval of 163.03, 153.03, 144.96 and 79.42 days for Autumn, Winter, Spring and Summer calvings, respectively, the longest being for autumn calvers. In the present study, however, Autumn calvers showed the shortest post-partum oestrus intervals. This difference could be due to variations in climatic conditions during autumn in these two countries.

The present findings showed that buffaloes calving during normal season manifested post-partum oestrus earlier than those calving during other seasons. This could be due to the effect of ambient temperature coupled with duration of day -length or availability of green fodder. The sexual activity of this species is said to be affected adversely by increased day-length and temperature. Majeed *et al.*(1966) reported that with decrease in day-length and temperature, the buffaloes became sexual active. El-Fouly *et al.* (1976 a) stated that the ovarian size of this species was maximum during December-February when the day-length and temperature were the lowest.

Buffaloes calving during spring are normally expected to exhibit post-partum oestrus in summer which, in this region, is characterised by high environmental temperature, maximum day length and scarcity of green fodder. So, most of animals remain an-oestrus during this season resulting in the longest post-partum oestrus intervals. However, buffaloes calving during summer or autumn show post-partum oestrus in following autumn or winter,as the temp-

erature and day- length register a declining trend along with plenty of green fodder due to heavy rains during autumn. This results in shorter post-partum oestrus intervals for buffaloes calving during summer or autumn. As far as winter calvers are concerned, they are normally expected to show first post-partum oestrus during spring during which temperature and day-length reveal an increasing trend but not as high as that observed in summer. During this season, however, there is abundance of available green fodder due to rains that come during the late winter. So, winter calvers exhibit longer (but shorter than that of summer calvers) post-partum oestrus intervals.

Thus, it is concluded that buffaloes calving during normal season show significantly shorter post-partum oestrus intervals than those calving out season.

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دورة الشبق فى الجاموس فى الباكستان

نظير احمد ، رشيد احمد شودرى ووحيد احمد

قسم الانتاج الحيوانى والوراثة ـ جامعة الزراعة فايسلباد ـ باكستان

درست سجلات ١٤١٠ حالة الشبق بعد الولادة لقطيع من جاموس النيلى ـ رافى بمحطة التجارب بقادرأباد ـ بالباكستان . وقد وجد أن طول الفترة من الولادة حتى أول شبق يتراوح بين ١٠ ـ ٦٦٣ يوم بمتوسط ١٢٨٫٦٩ يوما . كما لوحظ أن أطول فترة (١٧٨٫٠٤ أيام) فى الاناث التى وضعت فى شهر مارس بينما كانت أقصرها (٨٥٫٤٠ أيام) التى وضعت فى شهر ستمبر .