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## CLINICAL OBSERVATIONS ON TIMING OF PARTURITION IN CATTLE AND BUFFALOES

(With 8 Tables and 2 Figures)

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مشاهدات إكلينيكية عن توقيت حدوث الولادة فى الأبقار والجاموس  
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تم إجراء هذه الدراسة فى مزرعة كلية الطب البيطرى جامعة قناة السويس فى الفترة من أول أغسطس ١٩٩٥ وحتى نهاية يولييه ١٩٩٧ وذلك من خلال متابعة عدد ( ٨٦ ) حالة ولادة أبقار وكذا (٢١٣) حالة ولادة جاموس. وقد أوضحت الدراسة أن معدل حدوث الولادة فى الأبقار خلال ساعات النهار (٦٨,٦%) أكبر منه خلال ساعات الليل (٣١,٤%). كذلك بالنسبة للجاموس كان الفارق لا يذكر بين معدل حدوث الولادة نهاراً (٥٠,٧%) ونظيره ليلاً (٤٩,٣%). كذلك عدم وجود ارتباط بين توقيت حدوث الولادة وكلاً من عدد الولادات السابقة للأم - وزن وجنس المولود - وزن المشيمة وتوقيت نزولها بعد الولادة فى الأبقار والجاموس على السواء، كما وضح عدم وجود فروق معنوية فى توقيت حدوث الولادة بين الفصول المناخية المختلفة طوال فترة الدراسة.

### SUMMARY

Over a 2-years period, data on 299 calvings (86 cows and 213 buffalo) were collected at the animal farm, Fac. Vet. Med. Suez Canal University, Ismailia - Egypt, to study the pattern of parturition in both species. In buffaloes, the calving pattern was relatively uniform during day and night compared to a higher incidence of daytime calvings in cattle. No significant influence was found for dam parity, calf birth weight or sex, weight of the placenta, season of the year on the timing of parturition. No association was detected between the calving time and incidence of dystocia, retained placenta, stillbirth and vaginal or uterine prolapse.

*Key words: Cattle - Buffaloes - Parturition - Observations*

## INTRODUCTION

Parturition is a crucial event in the life of dairy cow. More diseases and veterinary costs are associated with the periparturient period than any other time (Lastar *et al.*, 1973; Shanks *et al.*, 1981). According to Hansen (1975); Philipsson (1976) and Gee *et al.*, (1989), abnormal parturition is one of the most important factors for calf losses, poorer subsequent fertility and higher culling rates than does normal calving.

In that sense, the hourly distribution of time of calvings is incriminated as a main cause for lack of adequate supervision during parturition necessary to save the life of the dam and fetus.

Unfortunately, information on the hourly distribution of calvings is limited and conflicting (Arthur 1961; Fraser 1974; Edwards 1979 and Yarney *et al.*, 1982).

Therefore, the present study was designed to record the hourly distribution of calving time in cattle and buffaloes. Moreover, the effects of dam parity, sex and birth weight of the calf as well as seasonal variations in temperature and humidity on calving time were investigated. Finally the risk of dystocia, stillbirth, genital prolapse and retention of placenta as related to the timing of parturition was studied.

## MATERIALS and METHODS

The present work was carried out during the period from August 1995 till the end of July 1997 at the animal farm, Fac. Vet. Med., Suez Canal University, Ismailia - Egypt.

A total of 299 calvings (86 and 213 pregnant cows and buffaloes respectively) were studied. The animals were 3 to 10 years old. They were fed twice daily between 06.00 and 09.00 h, and between 16.00 and 17.00 h. During the green season from January to the mid of May, Berseem (*Trifolium alexandrinum*) and concentrates were fed. Derris, green maize stem and rice straw were fed during the dry season from May 15<sup>th</sup> to the end of December. Lactating animals were milked twice daily at about 6 a.m. and 6 p.m.

The hourly distribution of calvings over the 24 hours were classified into three 8 h periods as: 1<sup>st</sup> period ( 0630-1430 h), 2<sup>nd</sup> period (1430 – 2230 h) and 3<sup>rd</sup> period (2230 – 0630 h). For each calving, data regarding



time of birth, dam parity as well as the risk of any calving problems such as vaginal or uterine prolapse, retained placenta, dystocia and/or stillbirth were noted.

For both cattle and buffaloes, data concerning calf birth weight, time of placental drop and its weight were collected from 48 calvings. The obtained data were statistically analyzed using the Chi-square ( $\chi^2$ ) test adopting Yates correction where necessary (Steel and Torrie 1980).

## RESULTS

In Table (1), seasonal variations in temperature and humidity in Ismailia City - Egypt were presented.

As shown in Tables (2, 3), the hourly distribution of calvings in cattle and buffaloes was presented. In cattle, the daytime calvings accounted for 68.6% compared to 31.4% of the calves being born at night (Table 4 and Fig. 2).

For buffaloes, (Table 4 and Fig. (2) showed a uniform distribution of calvings during day and night periods.

As shown in Tables (5, 6), no significant effect could be found for dam parity, calf sex and birth weight or weight of the placenta on the time of calving during the day or night in both cattle and buffaloes.

There was no association between the calving time and the incidence of some calving problems as dystocia, stillbirth, retained placenta, or genital prolapse (Tables 7, 8) for both cattle and buffaloes.

## DISCUSSION

### **I- Hourly distribution of time of parturition in cattle and buffaloes:**

In cattle, our data found that 68.6% of calvings were during daytime which disagrees with those of Arthur (1961); Dufty (1971) and Fraser (1974) who stated a strong bias in favor of night calvings. According to Arthur (1961), 2/3 of housed cattle calved between 18.00 and 06.00 h.

Regarding buffaloes, the obtained results showed that calvings are evenly distributed throughout the 24 hours day period. These results agree with those reported in cattle by Ewbank (1963); Slob (1968); George and Barger (1974); Edwards (1979) and Rahnefeld (1982) who found no evidence for a higher incidence of calving at night. Similarly Yarney *et al.*,

(1982) and Makarechian (1984) indicated that the frequencies of day and night calvings did not deviate significantly from the expected frequency of 50%.

By the way such contradictions may be attributed to differences in breed, dam parity, size of the material as well as the management system under which the cows are kept (Edwards 1979; Yarney *et al.*, 1982).

## **II- Factors influencing time of parturition :**

(a) *Season* : In contrast to some data that there is a diurnal pattern in the time of calvings depending on the season (George and Barger 1974; Makarechian 1984), The obtained results show no significant influence of the season on the timing of parturition both in cattle and buffaloes.

According to George and Barger (1974), autumn calvings occur predominately during dark hours whilst Makarechian (1984) reported that calving occurred more frequently at daytime.

On the other hand, our data indicate that the time of calvings seems to be unrelated to climatic factors such as temperature or humidity %.

(b) *Dam parity*: The lack of any association between calving time and dam parity in both cattle and buffaloes in the present study agrees with the data of Slob (1968) and Yarney *et al.*, (1982) who found no influence of cow age on the time of birth.

However, Edwards (1979) and Makarechian (1984) reported that the frequency of night calvings was higher amongst heifers compared with that of older cows (49.8% vs. 43.4%). According to Edwards (1979), older cows exhibited daily pattern of parturition based on the farm routine, perhaps the greater noise and activity during the time of milking set off some internal rhythms that may regulate the calving pattern in older cows.

(c) *Calf factors and placental weight*: In the present work, the time of parturition is unrelated to the calf sex or weight. Such data are in line with those of Yarney *et al.*, (1982) but in contrast with the findings of Baccari *et al.*, (1978) who mentioned that significantly more female calves were born at night.

On the other hand, the present results show no relationship between placental weight and calving time. Unfortunately no literature regarding this point is available.

(d) *Breed differences*: The findings stated that the breed differences could be a factor influencing the time of calving (George 1969; Lowman *et al.*, 1981 and Rahnefeld 1982) may support our results where the calving



pattern in cattle is biased towards daytime compared to a uniform distribution of parturitions over 24-hour period in buffaloes.

### **III- Calving problems in relation to the timing of parturition:**

Although it is generally accepted that the circadian patterns characteristic for hormone secretion will affect events around parturition and will influence the time of parturition, the onset of maternal behaviour and the over all reproductive efficiency (Van Tienhoven 1980; Fitzgerald and Jacobson 1992), no association was found between the timing of parturition and the incidence of some calving problems e.g. dystocia, stillbirth, retained placenta or genital prolapse in both cattle and buffaloes.

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**Table (1):** Seasonal variations in air temperature and humidity during (1995-1997) in Ismailia city – Egypt. (Obtained from The Meteorological Authority in Cairo)

Seasons	Air temperature C °		Humidity %
	Maximum	Minimum	
Autumn	29.5 ± 4.5 (21.5 - 34)	17.6 ± 4.5 (13.5 - 21.5)	64.5 ± 2.3 (62 - 66.5)
Winter	20.96 ± 0.90 (20 - 21.8)	10 ± 0.88 (9 - 10.7)	66.83 ± 2.75 (65 - 70)
Spring	27.33 ± 4.11 (23.7 - 31.8)	14.4 ± 2.98 (11.9 - 17.7)	58.2 ± 2.08 (56.5 - 60.5)
Summer	35.33 ± 0.25 (35.1 - 35.6)	22.13 ± 1.2 (20.8 - 23)	59.83 ± 5.03 (54.5 - 64.5)

**Table (2):** Hourly distribution of calvings in relation to year and season (Cattle).

Item	Time interval			Total no.	X <sup>2</sup>
	1st Period (0630-1430 h)	2nd period (1430-2230 h)	3rd period (2230-0630 h)		
* year					
95/96	26	15	14	55	X <sub>2</sub> <sup>2</sup> = 1.05 P > 0.05
96/97	13	7	11	31	
* Season					
Autumn	9	5	7	21	X <sub>6</sub> <sup>2</sup> = 6.13 P > 0.05
Winter	11	5	11	27	
Spring	9	6	3	18	
Summer	10	6	4	20	
Total no.	39	22	25	86	
%	45.4	25.6	29.0	100.0	

**Table (3) :** Hourly distribution of calvings in relation to year and season (Buffalo).

Item	Time interval			Total no.	X <sup>2</sup>
	1st Period (0630-1430 h)	2nd period (1430-2230 h)	3rd period (2230-0630 h)		
* year					
95/96	33	34	35	102	X <sub>2</sub> <sup>2</sup> = 5.33
96/97	23	39	49	111	P > 0.05
* Season					
Autumn	26	24	28	78	X <sub>6</sub> <sup>2</sup> = 4.77 P > 0.05
Winter	21	22	19	62	
Spring	7	11	15	33	
Summer	9	16	15	40	
Total no.	56	73	84	213	
%	26.3	34.3	39.4	100.0	

**Table (4):** The diurnal and nocturnal distribution of calvings during two years period (1995 - 1997) in cattle and buffalo

Animal	Time interval		Total no.	X <sup>2</sup>
	Day Period (0630 a.m - 0630 p.m)	Night Period (0630 p.m - 0630 a.m)		
Cattle	59 (68.6 %)	27 (31.4 %)	86	X <sub>2</sub> <sup>2</sup> = 0.20 P > 0.05
Buffalo	108 (50.7 %)	105 (49.3 %)	213	X <sub>2</sub> <sup>2</sup> = 1.5 P > 0.05
Total	167	132	299	



**Table (5):** Hourly distribution of calvings in relation to dam parity, Calf sex, birth weight, time elapsed for placental drop, and placental weight (Cattle).

Item	Time interval			Total no.	X <sup>2</sup>
	1st Period (0630-1430 h)	2nd period (1430-2230 h)	3rd period (2230-0630 h)		
<b>* Dam parity</b>					
1 <sup>st</sup> Calvers	13	5	5	23	X <sub>4</sub> <sup>2</sup> =7.17 P > 0.05
2 <sup>nd</sup> Calvers	6	7	8	21	
3 <sup>rd</sup> Calvers or more	20	10	12	42	
<b>* Calf sex</b>					
male	20	15	12	47	X <sub>2</sub> <sup>2</sup> =1.88 P > 0.05
Female	12	14	13	39	
<b>⊕ Calf b. weight</b>					
≥} 26 kg	7	9	7	23	X <sub>2</sub> <sup>2</sup> =1.08 P > 0.05
< 26 kg	9	7	9	25	
<b>⊕ Placental weight</b>					
≥} 3.5 kg	9	9	6	24	X <sub>2</sub> <sup>2</sup> =1.5 P > 0.05
< 3.5 kg	7	7	10	24	
<b>⊕ Placental drop</b>					
≥} 3.5 h	9	5	10	24	X <sub>2</sub> <sup>2</sup> =2.5 P > 0.05
< 3.5 h	7	10	7	24	

\* A total of 86 calvings were studied in these items.

⊕ Only 48 calvings were studied in these items.

b. birth

**Table (6):** Hourly distribution of calvings in relation to dam parity, Calf sex, birth weight, time elapsed for placental drop, and placental weight (Buffalo).

Item	Time interval			Total no.	X <sup>2</sup>
	1 <sup>st</sup> Period (0630-1430 h)	2 <sup>nd</sup> period (1430-2230 h)	3 <sup>rd</sup> period (2230-0630 h)		
<b>* Dam parity</b>					
1 <sup>st</sup> Calvers	12	11	14	37	
2 <sup>nd</sup> Calvers	6	11	6	23	X <sub>4</sub> <sup>2</sup> =3.75
3 <sup>rd</sup> Calvers or more	45	51	57	153	P > 0.05
<b>* Calf sex</b>					
Male	30	42	39	111	X <sub>2</sub> <sup>2</sup> =1.10
Female	25	34	43	102	P > 0.05
<b>⊕ Calf b. weight</b>					
≥} 42.5 kg	8	10	11	29	X <sub>2</sub> <sup>2</sup> =3.43
< 42 kg	7	6	6	19	P > 0.05
<b>⊕ Placental weight</b>					
≥} 5.5 kg	8	10	8	16	X <sub>2</sub> <sup>2</sup> =3.16
< 5.5 kg	11	6	5	22	P > 0.05
<b>⊕ Placental drop</b>					
≥} 4.5 h	9	11	5	25	X <sub>2</sub> <sup>2</sup> =4.7
< 4.5 h	7	5	11	23	P > 0.05

\* A total of 213 calvings were studied in these items.

⊕ Only 48 calvings were studied in these items.

b. body



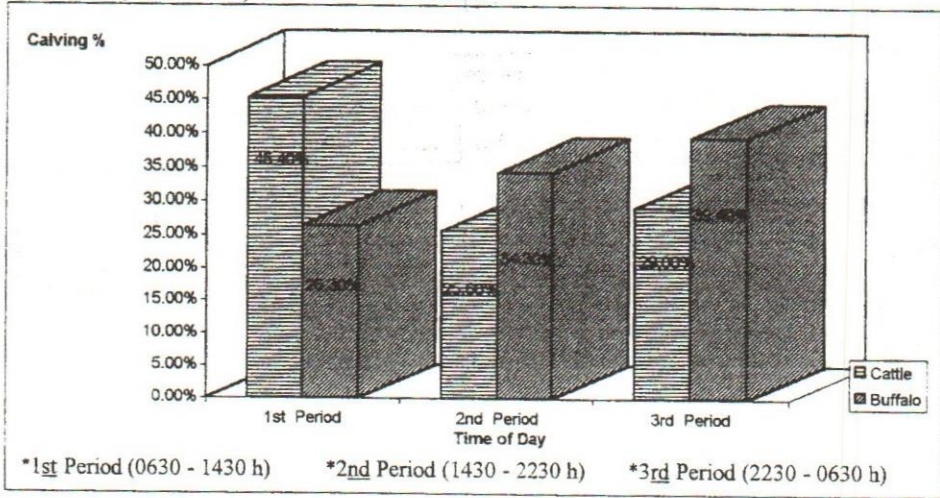
**Table (7):** Hourly distribution of calvings in relation to the incidence of some calving problems (Cattle).

Calving problems	Time interval			Total no.	X <sup>2</sup>
	1st Period (0630-1430 h)	2nd period (1430-2230 h)	3rd period (2230-0630 h)		
Dystocia	3	5	2	10	X <sub>4</sub> <sup>2</sup> = 2.64 P > 0.05
Stillbirth	1	3	2	6	
Retained placenta	3	1	2	6	

**Table (8):** Hourly distribution of calvings in relation to the incidence of some calving problems (Buffalo).

Calving problems	Time interval			Total no.	X <sup>2</sup>
	1st Period (0630-1430 h)	2nd period (0630-1430 h)	3rd period (2230-0630 h)		
Dystocia	11	3	5	19	X <sub>8</sub> <sup>2</sup> = .56 P > 0.05
Stillbirth	2	3	5	10	
Retained placenta	2	5	3	10	
Vaginal prolapse (Postpartum)	0	2	2	4	
Uterine Prolapse	0	2	4	6	

**Fig. (1):** Hourly distribution of calvings during two years period (1995-1997) in cattle and buffalo.



**Fig. (2):** The diurnal and nocturnal distribution of calvings during two years period (1995 - 1997) in cattle and buffalo.

