
K**S****CALVES DELAY ESTRUS CYCLES IN POSTPARTUM COWS
BY MECHANISMS OTHER THAN SUCKLING****S. D. Viker and G. H. Kiracofe****U**

Summary

It is generally accepted that the suckling stimulus and the interactions between lactation and level of nutrition regulate the interval from calving to cycling in beef cows. However, mastectomized cows (udder removed) kept with their calves had longer postpartum intervals to ovulation and estrus than mastectomized cows without calves. We conclude that ovulation and estrus can be suppressed by some cow-calf interaction that is independent of lactation and suckling.

(Key Words: Cows, Mastectomy, Postpartum Intervals, Calf Influence.)

Introduction

Cows that nurse a calf have longer intervals from calving to ovulation, estrus, and conception than cows without a calf. Mastectomized cows have shorter intervals from calving to estrus than both suckled and nonsuckled intact cows. In all of the above experiments, preventing suckling also involved separating the calf from the cow. Thus, the effect of the calf on the resumption of estrous cycles after calving was not separated from the effect of suckling.

We attempted to separate the effect of cow-calf interaction from suckling and lactation by comparing postpartum reproductive function of mastectomized cows in the presence and absence of their calves.

Experimental Procedures

This experiment involved two calf crops. In the first year, 11, 3-yr-old crossbred Angus cows that had raised one calf each were mastectomized at months 6 to 7 of their second gestation. All calves were removed from cows within 12 hr after birth. The intervals from calving to ovulation, estrus, and conception were measured.

In the second year, eight of the same cows were placed into two equal groups. In one group, the calves were removed at birth, whereas calves in the other group remained with the cows until 46 to 53 d after calving. Calves with their dams were hand fed from a nipples bottle or from a bucket every 12 hr. The two groups of cows were kept in separate drylots about 150 ft apart. Cows without calves could see and hear their calves and other cows but were never in contact with them.

All cows in both years were kept with a fertile bull in a drylot (60 d the first year; 80 d the second year) and fed a diet that maintained a body condition score of at least 6 on a scale of 1 to 9 (9=obese). Observations for estrus were made every 6 hr from calving until cows were determined pregnant or had an estrous cycle of at least 17 d.

Results and Discussion

First Year: All Calves Removed at Birth

The occurrence of estrus, ovulation, and conception after calving in the first year is given in Table 20.1. Based on serum progesterone concentrations, all cows ovulated between 7 and 28 d (average 13.9) after calving. Six of 11 cows showed no signs of estrus in association with the first ovulation, whereas all cows exhibited standing estrus with all subsequent ovulations.

Table 20.1. Interval from Calving to Ovulation, Estrus, and Conception in Mastectomized Cows without Calves

Cow no.	Day of ovulation ^a	Estrual activity ^b	No. of days between ovulations			Day of conception ^c	Length of gestation, d
			1st to 2nd ovulation	2nd to 3rd ovulation	3rd to 4th ovulation		
8	17	Standing	10	9	19	54	281
13	12	None	18	—	—	29	279
19	14	Standing	18	—	—	31	281
22	11	Standing	9	18	—	37	273
24	15	Hyperactive	8	—	—	22	279
30	12	None	14	39	—	open	—
39	12	None	9	—	—	20	276
45	15	Standing	19	25	—	58	282
83	28	None	14	—	—	41	279
101	10	None	8	—	—	17	283
123	7	None	8	19	21	open	—
Average	13.9	—	12.3	22.0	20	24.3	279.2

^aDay of calving was Day 0. Time of ovulation was recorded as 1 d after the onset of estrus or 3 d before an abrupt rise in serum progesterone concentration if standing estrus was not observed.

^bActivity associated with the first ovulation; a standing estrus was observed with all subsequent ovulations.

^cAll cows were exposed to a fertile bull for 60 d after calving.

Second Year: Effect of Calf

Data in Table 20.2 depict the intervals from calving to ovulation, estrus, and conception for cows that were kept with their calves and for those whose calves were removed at birth. Cows in both groups had body condition scores of approximately 7.

Table 20.2. A Comparison of the Intervals from Calving to Ovulation, Estrus, and Conception in Mastectomized Cows with and without Calves

Cow no.	Day of calf removal ^a	Day of ovulation ^b	Estrual activity ^c	No. of days between ovulations		Day of conception ^d
				1st to 2nd ovulation	2nd to 3rd ovulation	
13	0	14	None	20	—	33
19	0	14	None	7	—	20
24	0	22	None	8	—	29
45	0	14	Standing	8	19	40
22	46	50	Standing	8	—	57
39	47	51	Hyperactive	7	—	57
83	51	54	Standing	7	—	60
101	53	54	Hyperactive	7	—	60

^aDay of calving = Day 0.

^bDay of ovulation was recorded as 1 d after the onset of estrus or 3 d before an abrupt rise in serum progesterone concentration if standing estrus was not observed.

^cActivity associated with the first ovulation; a standing estrus was observed with all subsequent ovulations.

^dAverage intervals from calving to ovulation, estrus, and conception between cows with calves and cows without calves differed ($P < .005$).

Average intervals from calving to ovulation, estrus, and conception for cows whose calves had been removed were similar ($P > .2$) between years (first year, 13.9, 20.1, and 34.3 d vs second year, 16.0, 24.0, and 30.5 d, respectively). However, none of the cows left with their calves ovulated, expressed any signs of estrus, or conceived while their calves were present. After calves were removed, all cows ovulated within the next 4 d, exhibited estrus within the next 10 d, and conceived within the next 11 d.

It has not been determined whether tactile stimuli, cow-calf bonding, or some other cow/calf interaction is necessary for the inhibition of ovulation. However, it is clear that direct stimulation of the teat or mammary gland is not essential for the calf to inhibit estrous cycles.

We conclude that ovulation and estrus can be suppressed by some cow-calf interaction that is independent of lactation and suckling. In mastectomized cows, this suppression can last for at least 50 d after calving.