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## Restricting calf presence without suckling shortens postpartum interval to first ovulation

### Abstract

The suckling interaction between a cow and her calf is one of the factors that maintains a cow in postpartum anestrus (the period between calving and the beginning of first estrous cycle). Anestrus continues if the cow perceives that her calf is attempting to nurse, even when the mammary glands have been denervated or removed. Cross-fostering of an alien calf to a cow fails to maintain postpartum anestrus, indicating that cow-calf recognition is also a factor. We restricted calves so they could nuzzle the cow's head and neck but could not suckle. Compared with weaning calves 1 wk postpartum, restriction lengthened the interval to first postpartum ovulation but less than with normal suckling. These results suggest that maintaining cow-calf recognition in the absence of the suckling stimulus is an essential part of the nursing mechanism that prolongs anovulation. Thus, blocking the cow's recognition of her calf might further decrease the postpartum interval to first ovulation.

### Keywords

Cattlemen's Day, 1994; Kansas Agricultural Experiment Station contribution; no. 94-373-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 704; Beef; Suckling; Anestrus; Estrous cycles; Postpartum

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## RESTRICTING CALF PRESENCE WITHOUT SUCKLING SHORTENS POSTPARTUM INTERVAL TO FIRST OVULATION

*D. P. Hoffman and J. S. Stevenson*

### Summary

The suckling interaction between a cow and her calf is one of the factors that maintains a cow in postpartum anestrus (the period between calving and the beginning of first estrous cycle). Anestrus continues if the cow perceives that her calf is attempting to nurse, even when the mammary glands have been denervated or removed. Cross-fostering of an alien calf to a cow fails to maintain postpartum anestrus, indicating that cow-calf recognition is also a factor. We restricted calves so they could nuzzle the cow's head and neck but could not suckle. Compared with weaning calves 1 wk postpartum, restriction lengthened the interval to first postpartum ovulation but less than with normal suckling. These results suggest that maintaining cow-calf recognition in the absence of the suckling stimulus is an essential part of the nursing mechanism that prolongs anovulation. Thus, blocking the cow's recognition of her calf might further decrease the postpartum interval to first ovulation.

(Key Words: Suckling, Anestrus, Estrous Cycles, Postpartum.)

### Introduction

Reproduction is a critical factor limiting production efficiency in the beef cow. Failure of the cow to become pregnant during the breeding season limits the potential calf crop. To improve reproductive efficiency, the postpartum interval (time from parturition to first ovulation) needs

to be reduced. The suckling stimulus is an important component in lengthening the postpartum period of anestrus.

Cows whose calves were weaned at birth had shorter intervals to first ovulation than cows that were suckled. Cows with non-suckling (muzzled or nose-plated) calves had longer intervals to first postpartum estrus than with cows whose calves were weaned. Suckled cows with denervated udders, maintained with their calves, had intervals to first postpartum estrus similar to those of intact cows maintained with their calves.

Mastectomized (udder removed) cows with their calves present had intervals to first postpartum ovulation similar to those of udder-intact cows with their calves, indicating that presence of the mammary glands was not essential for prolonging anestrus in beef cows. Mastectomized cows whose calves were restricted so they could not attempt to suckle cycled about 7 d later than mastectomized cows whose calves were removed at birth.

Cows with cross-fostered calves cycled as early as cows whose calves were weaned, suggesting that the cow must perceive her own calf to be suckling in order to prolong postpartum anestrus. The objective of our experiment was to determine how restricting the calf to head and neck contact with its dam would alter the onset of postpartum estrus in udder-intact beef cows.

## Experimental Procedures

Twenty-four multiparous, crossbred, Angus, cow-calf pairs were assigned randomly to three groups: 1) calves had normal unrestricted contact with their dams (calf present; CP); 2) at 7 days ( $\pm 3$ ) of age calves were placed in a small individual pen within the dam's individual pen where the calf could make tactile contact to its dam's head and neck but could not suckle (calf restricted; CR); and 3) calves were weaned permanently from their dams 7 days ( $\pm 3$ ) after birth (calf weaned; CW). Calves in the CP and CR treatments were weaned permanently when 42 days ( $\pm 3$ ) old.

Cows were fed according to NRC recommendations based on weekly individual body weights of each cow. The CP cows were fed as superior milk producers and the CR and CW cows were fed as dry second-trimester, pregnant, beef cows. Calves in the CR treatment were bottle-fed milk replacer twice daily. The cows

were removed twice daily from their pens for exercise, at which time they were observed for signs of estrus. Blood was collected daily to assess changes in serum progesterone.

## Results and Discussion

Postpartum intervals to first ovulation are summarized in Table 1. The postpartum interval to first ovulation was shorter ( $P < .01$ ) in the CW ( $21.5 \pm 2.4$  d) than the CP treatment ( $42.5 \pm 2.2$  d). This same response was observed in previous experiments using similar treatments but mastectomized cows. The CR cows had intervals to first ovulation ( $29.1 \pm 2.2$  d) between those for CP and CR cows, but different ( $P < .01$ ) from both. These results suggest that maintaining cow-calf recognition in the absence of suckling by the calf is an essential part of the mechanism that prolongs anovulation. Thus, blocking the cow's recognition of her calf might further decrease the postpartum interval to first ovulation.

**Table 1. Average Intervals to First Postpartum Ovulation in Beef Cows with Either Calf Presence, Restricted Calf Presence, or No Calf**

Treatment <sup>a</sup>	No. of Cows	Interval, d
Calves weaned (CW)	7	$21.5 \pm 2.4^x$
Calves restricted (CR)	8	$29.1 \pm 2.2^y$
Calves present (CP)	8	$42.5 \pm 2.2^z$

<sup>a</sup>At d 7 ( $\pm 3$ ) postpartum, calves were weaned from their dams (CW), restricted to head and neck contact with their dams (CR), or allowed unlimited contact with their dams (CP). Calves in CR and CP treatments were weaned at d 42 ( $\pm 3$ ) postpartum.

<sup>xyz</sup>Average intervals with uncommon superscript letters are different ( $P < .01$ ).