

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 587

1995

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Recommended Citation

Lamb, G.C.; Smith, J.M.; and Stevenson, Jeffrey S. (1995) "Ad libitum suckling by a foster calf in the presence or absence of the cow's own calf prolongs postpartum anestrus to first ovarian cycle (1995)," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.1990>

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AD LIBITUM SUCKLING BY A FOSTER CALF IN THE PRESENCE OR ABSENCE OF THE COW'S OWN CALF PROLONGS POSTPARTUM ANESTRUS TO FIRST OVARIAN CYCLE

G. C. Lamb, J. M. Smith, and J. S. Stevenson

Summary

Five treatments were initiated approximately 15 days after calving: 1) calf was weaned from its dam (CW); 2) calf was present continually with its own dam (CP-O); 3) calf was present continually with its own dam but contact with the udder was restricted (CR); 4) foster calf was present continually but the cow's own calf was absent (CP-F); and 5) foster calf was present continually, and the dam's own calf was present but restricted (CR+F). Cows weaned at 15 days (CW) cycled in about 2 weeks, whereas cows in the CR treatment cycled 1 week later, and cows in the CP-O treatment did not cycle for about 5 weeks. Cows fostering calves in the presence (CR+F) or absence (CP-F) of their own calves had extended anestrus periods similar to those in cows nursing their own calves (CP-O). If a cow bonds with a foster calf (as in the CP-F treatment), then the duration of anestrus is lengthened. We conclude that anestrus is prolonged only when milk is removed by a calf (her own or a foster calf) to which the cow is bonded.

(Key Words: Suckling, Anestrus, Cow, Postpartum.)

Introduction

The length of gestation in cows limits producers to one calf crop per year. Suckling lengthens the period from parturition to first estrus, which may lengthen the calving interval beyond the ideal 1 year. Reproductive efficiency of cows could be increased by reducing the interval to first estrus.

The cow-calf suckling interaction is a critical component in lengthening anestrus. Cows suckled continually have longer intervals to first

estrus than cows whose calves have been weaned. Anestrus is longer in cows that are nursed more frequently. Presence of non-suckling (muzzled or nose-plated to prevent suckling) calves lengthens anestrus as much as when calves can suckle, because the perception of suckling or milk removal is maintained with continued calf presence.

When maintained with their own calves, udder-intact cows and cows with denervated udders had similar intervals to postpartum estrus. Mastectomized cows maintained with their calves remained anestrus longer than weaned mastectomized cows, suggesting that presence of the calf but not the mammary gland was essential for prolonging anestrus. Both mastectomized cows and udder-intact cows, whose calves were restricted so they could not suckle, cycled about a week later than cows whose calves were not present.

Cows that limit-nursed foster calves (limited to four suckling bouts per day for 10 minutes) had shorter intervals to first estrus than cows nursing their own calves. This suggests that the cow must recognize her own calf to be nursing in order to prolong anestrus. The present experiment was designed to determine whether nursing a foster calf in the presence or absence of the cow's own calf would alter the interval to the first ovulation.

Experimental Procedures

Thirty-one multiparous, crossbred (Angus × Hereford) cow-calf pairs were assigned randomly to five treatments at 15 days after birth: 1) calves were weaned permanently from their dams (calf weaned; CW); 2) calves were placed in a pen within the dam's individual pen, where the calf could make tactile contact to the

dam's head and neck but could have no contact with the mammary gland (calf restricted; CR); 3) cows had unrestricted access to their own calves (own calf present; CP-O); 4) cows had unrestricted contact from a foster calves (foster calf present; CP-F); 5) cows had restricted contact with their own calves (CR treatment) plus unrestricted contact from foster calves (CR+F).

Cows were fed individually to meet NRC recommendations, and intakes were adjusted weekly according to individual body weight and condition. The CW and CR cows were fed as dry second-trimester, pregnant, beef cows and the CP-O, CP-F and CR+F cows were fed as superior milk producers. Restricted calves in the CR+F and CR treatments were fed milk replacer twice daily.

Daily blood samples were taken from cows to determine the onset of the first progesterone rise after treatment initiation. Ovulation generally occurs 1 to 2 days before serum progesterone exceeds .5 ng/ml for at least 2 days.

Results and Discussion

The postpartum interval to first rise in progesterone (Table 1) was shorter ($P < .05$) in the CW (13.6 ± 4.4 d) and CR (22.0 ± 4.4 d) treatments than in the CP-O (38.4 ± 4.4 d), CP-F (38.8 ± 4.4 d), or CR+F (35.7 ± 4.4 d) treatments. Although no significant difference occurred between the CW and CR treatments, there was an apparent delay in estrus of about 8 days. This supports an earlier report that maintained cow-calf recognition even in the absence of suckling prolongs anovulation (1994 Cattleman's Day; KAES Report of Progress 704:111). The current data suggest that cows in the CP-F treatment formed a new bond with their foster calves, and that bonding prolonged the postpartum interval to first estrus, because cows in the CR-F treatment had prolonged anestrus equal to CP-O. Apparently, both milk removal and a cow-calf bond (with own calf or with a foster calf) are essential for prolonged anestrus. Thus, we can conclude that a cow does not require her "own" calf to suckle to prolong anestrus, because the cow-calf suckling interaction can be newly formed with a foster calf.

Table 1. Average Intervals to First Postpartum Rise in Serum Concentration of Progesterone

Treatment	No. of Cows	Days to first P4 ^a > .5 ng/mL
Calf weaned (CW)	6	13.6 ± 4.4^x
Calf restricted (CR)	6	22.0 ± 4.4^x
CR + foster calf (CR+F)	6	35.7 ± 4.4^y
Foster calf present (CP-F)	6	38.8 ± 4.4^y
Own calf present (CP-O)	7	38.4 ± 4.1^y

^aProgesterone rise indicates ovulation occurred and the first postpartum estrous cycle was initiated.

^{x,y}Means with uncommon superscript letters differ ($P < .05$).