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## SYNCRO-MATE B® INDUCES ESTRUS IN COWS WITHOUT OVARIES

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### Summary

Syncro-Mate B® was capable of inducing estrous behavior in ovariectomized cows. Lengthening the norgestomet implant period from 9 to 18 days did not prevent estrus. The ability of Syncro-Mate B to induce estrous behavior in ovariectomized cows helps explain the variable conception rates obtained after using this product in intact cows.

### Introduction

Syncro-Mate B® is a commercially available estrous synchronization product. Use of this product typically results in a high degree of synchronization of estrus behavior. However, conception rates are often variable, especially when anestrous cows and prepubertal heifers are involved.

Normally, cows exhibit estrus in response to estrogen from their own ovaries. If Syncro-Mate B can induce estrus behavior in ovariectomized cows, then the product can produce estrus behavior independent of ovarian function, which could explain much of the variability in fertility associated with its use.

We conducted two trials to determine if 1) treatment of ovariectomized cows with Syncro-Mate B could induce estrous behavior and 2) if so, would lengthening the exposure to the norgestomet implant prevent the treatment-induced estrous behavior.

### Experimental Procedures

**Trial 1.** Trial 1 was replicated three times and consisted of 9, 9, and 11 mature Hereford x Simmental cows, respectively. Cows were ovariectomized either 6 months or 3 days before the start of the experiment. All cows received the recommended Syncro-Mate B treatment: a 2 cc intramuscular injection containing 5 mg estradiol valerate and 3 mg norgestomet given simultaneously with a hydron ear implant containing 6 mg norgestomet. The implant was removed 9 days later. Cows were observed for estrus four times daily for 3 days following implant removal. Blood samples were collected from cows in estrus and again 10 day following estrus.

**Trial 2.** The same cows used in Trial 1 were randomly allotted to receive either 1) the same Syncro-Mate B treatment used in the previous trial or 2) the standard Syncro-Mate B treatment plus a second 9 day norgestomet implant given 12 hours before the removal of the first implant. Treatments were timed such that implants were removed from both groups at the same time. The trial was repeated twice, and cows were switched between treatment groups. Cows were observed for estrus, and blood was collected for progesterone assay as in the first trial.

## Results and Discussion

**Trial 1.** The incidence of estrual behavior in the ovariectomized cows following treatment with Syncro-Mate B was 3, 7, and 6 out of 9, 9, and 11 cows, respectively. Pooled results showed that 55% of the cows exhibited estrus. Only basal levels of progesterone were found in blood serum collected 10 days after estrus, indicating that ovariectomy was complete and that no ovulation had occurred. Serum estradiol-17 beta concentrations on the day of estrus were not different (3.78 vs. 4.40 pg/ml) between the long-term and recently ovariectomized cows. However, estradiol concentrations did differ ( $P < 0.05$ ) between long-term cows that exhibited estrual behavior vs. those that did not (3.78 vs. 1.38 pg/ml).

**Trial 2.** The incidence of estrus in ovariectomized cows after one implant was 1/5, 2/5, and 0/5; with two implants, it was 1/6, 1/6, and 1/5. Extending the length of the norgestomet implant period had no effect on the number of cows exhibiting estrus (20% of the single-implant cows vs. 17.6% of the double-implant cows). In the single implant group, serum estradiol concentrations tended to be higher for cows exhibiting estrus. There was no difference between estrual and nonestrual cows of the double-implant group. In cows that exhibited estrus, serum estradiol concentrations were higher in the single- vs. the double-implanted cows (2.96 vs. 1.16 pg/ml).

Fertilization after insemination at the synchronized estrus depends on precise timing of ovulation with estrus. In the intact cow, the Syncro-Mate B treatment may be capable of either inducing estrus without ovulation or altering the timing between estrus and ovulation, resulting in a fertilization failure.

