Response Time to Estrus Synchronization

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Summary

Heavy milking cows took longer to respond to estrus synchronization than light milking cows. There was no difference in response time between cows treated with Estrumate and Lutalyse. Cow weight, height or condition had no effect on estrus response time.

Introduction

Several products are available to synchronize estrus in cows. Response time from administration to estrus was compared using Lutalyse® and Estrumate®. The effect of breed, age, lactation status, weight, height, condition and level of milk production on response time were evaluated.

Experimental Procedures

Ninety observations were obtained from 70 Polled Hereford and Simmental cows synchronized with either Lutalyse® or Estrumate®. Cows were from 2 to 14 years old and all had at least one normal estrus after calving. Cows were synchronized on May 8, May 22 and June 5. Weights and hip heights were obtained on May 4 and weights on June 4. Milk production was measured using the standard weigh-suckle-weigh procedure on May 21-26 and June 21-26. Ratio of weight to height was used to estimate condition. Cows were checked twice daily and androgenized cows with markers were used to aid in estrus detection. A generalized linear model was used to obtain least squares means and regression coefficients.

Results and Discussion

Heavy milking cows took longer to respond to estrus synchronization than light milking cows ($P=0.03$). Each additional 10 lbs of daily milk production increased the response time by 9 hours.

There was no difference in response time between Estrumate® and Lutalyse® (Table 6.1), between Polled Hereford and Simmental cows or among the three treatment dates. Lactating cows tended to respond slower ($P= .17$) than dry cows. Older cows responded slightly sooner ($P= .09$) than younger cows (1.2 hours for each year older). Cow weight, height, or condition had no influence on response time.

Table 6.1. Time from Treatment to Estrus

Groups	No. observations	Hours
Date		
May 8	31	70.8 ± 3.6
May 22	26	65.8 ± 3.9
June 5	33	63.5 ± 3.8
Breed		
Polled Hereford	37	66.5 ± 4.4
Simmental	53	66.9 ± 4.1
Lactation status		
Dry	10	62.9 ± 5.0
Lactating	80	70.5 ± 1.9
Product		
Estrumate®	43	68.1 ± 3.0
Lutalyse®	42	65.3 ± 3.3

HOW DO PROSTAGLANDINS SYNCHRONIZE ESTRUS?

When a cow ovulates, a corpus luteum forms and remains on the ovary. That corpus luteum produces progesterone, which prevents the cow from showing estrus (heat). If the cow is bred and settles, the corpus luteum remains, and the progesterone produced helps maintain pregnancy. If she is not pregnant, the corpus luteum regresses in about 17 days, and the ovary prepares for the next cycle. Prostaglandin and many of its related compounds will cause the corpus luteum to regress if it is injected between 5 and 17 days after heat. Because the corpus luteum is no longer present, progesterone secretion stops, and the cow exhibits heat in about 3 days. Since prostaglandin doesn't work during the first 5 days of the cycle, a single injection of prostaglandin will synchronize only about three-fourths of the cycling cows. So another injection 11 to 12 days after the first is needed to make sure that all the cycling cows come into heat. Obviously, prostaglandin will not cause estrus in a cow that is not cycling. Because progesterone from the corpus luteum is necessary to maintain pregnancy, an injection of prostaglandin will cause abortion up to about 150 days of pregnancy.