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Prostaglandin Synchronization Program

Dairy farmers lose millions of dollars each year because optimum calving intervals are not achieved. It is proposed that a cow should calve every twelve months for maximum profitable production. But poor heat detection and low first service conception rates contribute to longer calving intervals.

Several years ago a study conducted by Dr. Charles Love at the Penn's School of Veterinary Medicine showed that these intervals could be shortened by injecting postpartum cows at regular intervals with prostaglandin. Prostaglandin, a naturally occurring hormone, shortens intervals between heat cycles.

Drs. Ferguson and Galligan of Penn's Center for Animal Health and Productivity took these findings and developed an integrated breeding management program to increase the reproductive efficiency in a dairy herd. They have shown that a program of prostaglandin injections at two week intervals initiates and synchronizes estrus in cows and shortens calving intervals. Cows respond to PG injections only when they are between days seven to 17 (diestrous) of a 21-day estrus cycle. Seventy five to 95% of diestrous cows will be in estrus three to five days following a PG injection. In the remaining cows estrus will be on day two or between days six to 10 following the injection. By random chance in a group of cycling cows 52% of cows will be diestrous on any given day. An additional 15% of cows will be proestrus, one to three days prior to estrus. 5% will be in estrus, and 29% of cows will be in metestrous (one to six days post estrus).

If all cows in a random group of cows were given an injection of PG, approximately 71% of the cows will appear to be in estrus one to five days following injection. Depending on the heat detection program, various numbers of cows will be observed in estrus and inseminated following the PG injection. Cows in metestrous will not respond and will not be in estrus following the injection.

Fourteen days later, 95-98% of cows in this random group of cows will be diestrous or proestrus. A second injection of PG 14 days following the first injection will apparently induce estrus in 95-98% of cows. Cows metestrous at the first injection and cows in estrus following the first PG injection will be diestrous at the second injection. Thus, synchronization of estrus will be high following a second injection 14 days after the initial injection. Synchronization will be almost 30% higher using a 14 day rather than an 11 day schedule.

Penn's researchers recommend that farmers establish a voluntary waiting period (VWP) for the herd. They routinely recommend 50 days post calving, but this may vary, depending on the goals of the farm. As cows reach the end of VWP, assign a day of the week to give PG, for example, Friday. Cows at or past the end of VWP each are given a PG injection on this Friday. Heat detectors are placed on their back. From Monday to Friday following injection, about 70% of these cows should be in standing estrus and inseminated. Cows not inseminated are scheduled for a second PG injection 14 days later. Along with known times, increased likelihood that cows are in heat following the second injection, improving the efficiency of timed insemination; fewer days to first breeding; synchronization of pregnancy exam to always find open cows prior to 12 days postbreeding, reducing days between breedings.

Prostaglandin is approved in dairy cows to initiate and synchronize estrus. Relatively inexpensive and easy to administer, it is metabolized rapidly by the cow and has no side effects on the animal. The hormone enables the dairy farmer to control the length of the calving interval in his cows and to reduce his veterinary costs because fewer visits are needed to perform pregnancy checks in a synchronized herd.