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Prostaglandin Synchronization Program

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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 of milk. 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 (diestrus) of a 21-day estrus cycle. Seventy five to 95% of diestrus 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 diestrus 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 metestrus (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 insemi-

nated following the PG injection. Cows in metestrus 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 diestrus or proestrus. A second injection of PG 14 days following the first injection will apparently induce estrus in 95-98% of cows. Cows metestrus at the first injection and cows in estrus following the first PG injection will be diestrus at the second injection. Thus, synchronization of estrus will be high following a second injection 14 days

new cows who now have reached the end of VWP. Cows receiving a second PG injection may be inseminated on standing estrus or an appointment at 80 to 104 hours post injection. Cows are re-bred if seen in heat 21 days later.

Cows are checked for pregnancy 32 to 40 days postbreeding. If open, they re-enter the PG pool.

Prostaglandin synchronization provides a number of benefits: more cows are in heat at the same time, increasing expression of estrus; labor may be focused to watch for estrus at



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 42 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.