Dairy Reproduction Beyond Palpation

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Bovine practitioners serving dairy clients traditionally demonstrate sincere concern for the financial well-being of their producers. Recognizing poor reproductive performance as a leading cause of financial loss for dairies, most veterinarians offer reproductive herd health services to rectal palpation of cows after calving, before breeding, and for pregnancy diagnosis.

Postpartum exams identify cows requiring treatment for metritis. Prebreeding exams screen for cows requiring further treatment prior to breeding, and provide estimates of stage of estrous cycle. Pregnancy diagnoses identify open cows needing to be rebred.

Reviewing DHI data since the widespread adoption of these practices, little evidence is available to support the benefit of these programs.[1] This data supports the need to review the goals of our reproduction efforts, and how well our efforts impact these goals.

Commonly stated goals include reducing average calving interval in the herd, and minimizing average days open. Days open past 100 days have been demonstrated to cost the producer $2-$5.00 per cow per day .[2] I question if financial loss is properly measured by examining average calving interval, or days open, or whether financial loss is better evaluated by measuring the percent of cows experiencing particularly long calving intervals. Are average calving intervals approaching 14 month less profitable than 12 month calving intervals because individual cows with 14 month calving intervals are less profitable, or because a 14 month herd average represents a high percentage of cows with much longer intervals?

Rather than concentrate on average calving interval, our goal should be to minimize the percent of cows experiencing particularly long lactations. The days open past which the individual is considered less profitable is a matter of discussion for the veterinarian and producer. The important point is to choose a measuring point for each herd, and to track the percentage of the herd that conceives past this goal.

If too many cows conceive past this point, how does our reproduction program impact performance to reduce this number? How do programs limited to rectal palpations influence the pregnancy rate prior to this set point?

Factors impacting pregnancy rate prior to our goal include voluntary waiting period (VWP), number of estrous cycles between VWP and goal, heat detection (HD), and conception rate. Past recommending an optimum, VWP is not a factor we will impact with our programs. Profitability of reproductive programs is a factor of our impact on number of cycles, heat detection, and conception rate.

Reviewing present programs, we must ask how our palpations positively affect one or all of these areas. Certainly, number of cycles is difficult to alter through palpation, but can be increased with a proper prostaglandin protocol.

Heat Detection

We typically strive to impact heat detection through estimates of the time of next expected estrus. Producers appreciate this service, as problem breeders finally get some semen in them (by breeding on the predicted day). I seriously doubt that many cows conceive when bred on these predictions.

Unfortunately, predicting next estrus often has a negative impact. Rather than vigilantly maintaining heat detection on the cow in question, the producer tends to breed her on the prescribed day, and hope for the best. Because she may have conceived, she is no longer a candidate for cycling with prostaglandin, eliminating our opportunity to reduce the time to next estrus. Estimating time of next heat will often have a negative impact on conception.

With the advent of prostaglandins to induce estrus, many prebreeding exams are used to estimate presence of a viable corpus luteum (CL). By only administering prostaglandin to cows with palpable CL's, producers avoid the financial loss associated with injecting cows that won't respond. This assumption has two flaws; that we can reliably palpate for functional luteal tissue, and that the saved treatment cost is less than the total cost of palpation.

The ability to detect ovarian status through palpation may not be reliable.[3] Inaccurate predictions are costly to the producer, due to lost opportunities to cycle cows with functional CL's that are missed in palpation.[4]

Routine injection of all cows not carrying service, every two weeks until found in standing heat, increases the number of estrous cycles in our optimal breeding period, and can improve heat detection. Grouping most heats into a three day period every two weeks allows the producer to concentrate heat detection efforts. Due to greater numbers of cows in heat at once, there is more estrous activity,[5] increasing the ability to detect heats.

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Conception

Postpartum exams may positively affect conception rate through the early treatment of metritis. Intrauterine infusion of antibiotics has been traditionally used to treat metritis, and prepare the uterus for conception. Similar results have been demonstrated with injected prostaglandins.[6] Disadvantages associated with intrauterine antibiotics include costs for veterinary time, farm labor, milk withholding, and the question of extra label drug use.

Postpartum cows should be evaluated for presence of metritis. This can be accomplished through a single rectal palpation by the veterinarian, or careful observation by the herdsman. Excluding the veterinarian from this decision places a great amount of responsibility on the herdsman. If this route is chosen, the veterinarian and herd owner should periodically review the success of this strategy. A third option is to inject all cows postpartum with prostaglandin. Prostaglandin treatment between 14 and 28 days postpartum has been demonstrated to reduce days to conception,[7] and has worked exceptionally well in our practice.

Subfertile cows are often identified through prebreeding exams (lack of ovarian structures), but how do these exams impact the outcome of these cows? Successful reproductive programs must understand the cause of poor fertility, and intervene to improve that condition. Poor fertility is often associated with body condition loss postpartum,[8,9] and energy balance in the early lactation cow.[10] These conditions are largely a factor of body condition at calving, periparturient disease, and feed bunk management postpartum.

When involved with subfertile herds, little progress is made if our approach is limited to rectalling cows and confirming their infertility. To impact these herds, we have to impact body condition postpartum. Time spent evaluating dry cow programs, reducing periparturient disease, and improving feed bunk management will give far greater returns to the producer.

Monitoring

Once we have assessed the impact of our reproductive program, we need to agree to a set point for measuring reproductive failures. When establishing our goal for maximum days to conception, we must recognize the difference between a herd with a 14 month calving interval, and an individual cow with a 14 month interval. Some models suggest that $2-$5.00 lost profitability for every day open past 100 days is too high,[11,12] and that there is little difference in profitability from 12 to 14 month calving intervals for individual cows.[13,14]

When assessing reproductive performance, it may not represent an economic loss to have many individuals near 14 months. When assessing the average calving interval for the herd, 14 months usually represents significant economic loss. If the herd averages 14 months, this often represents a high percentage grouped past 15 months. What is significant is not the average of the herd, but the percentage that will have long intervals that are clearly unprofitable.

For monitoring purposes, I calculate the percent of pregnant cows that conceived after 155 days in milk. The first goal of my reproductive program is to minimize the percent of cows that conceive past 155 days. I consider herds with greater than 30% of pregnant cows falling into this category to be problem herds, but in many herds more than 40% fall into this category. Herds with less than 25% of cows conceiving past 155 days are considered to have good reproductive health, and herds below 20% excellent.

Reviewing DHI records in high producing herds consistently demonstrates dramatic loss in 305 day production, when cows conceive before 80 days in milk. A second goal of my reproductive program is to reduce the percentage falling into this category. My optimum goal then, is to group all cows between 80 and 155 days in milk at conception.

For most herds, this does NOT allow us to extend our voluntary waiting period to 80 days. Because our first goal is to avoid long lactations, we must consider the risk factor associated with delayed VWP. If the herd has demonstrated the ability to achieve 60% of pregnancies in the time frame from 80-155 days, and our VWP is 80 days, 40% of the herd will have undesirably long lactations. If herd management limits conceptions during the optimum period to 60%, 20% need to conceive prior to 80 days to restrict the percentage conceiving past 155 days to 20%.

As herd management increases the percentage conceiving from 80-155 days, we can reduce the number of short lactations, while maintaining a low percentage over 155 days.

Summary

To achieve reproductive goals, VWP periods must reflect the risks of increasing the percentage of long lactations. Intervention programs must impact frequency of estrus, estrus observation, and conception rate. To justify rectal palpation programs, we must demonstrate a positive impact on one or more of these factors.

Planned use of prostaglandin during the optimum breeding period can positively impact frequency of estrus, and estrus detection. Veterinarians becoming more involved in the management of the periparturient cow can impact conception at first service.

Monitoring programs should focus on the distribution of days open, rather than the average.

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