

Raising the Bar – Using Technology and Protocols For Profitable Reproduction Results

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REPRODUCTION - THE KEY PERFORMANCE INDICATOR

Reproductive performance determines the opportunity a dairy producer has to maximize income and profits. Fresh cows give the opportunity to increase production and eliminate marginal animals from the herd voluntarily. The percentage of the herd over 305 days in milk (**DIM**) will affect herd average production significantly. Improving reproductive performance is the basis of future profits. When pregnancy is delayed several additional costs are incurred on the *under performers*.

- Extended DIM with a declining lactation curve
- Extra semen through repeat breedings
- Labor to breed and give injections
- Veterinary and drug costs of extended protocols
- Costs of replacements for reproductive failures
- Loss of marginal milk – the herd production influenced by extended days in lactation

Figure 1. Various economic indicators relative to days in lactation.

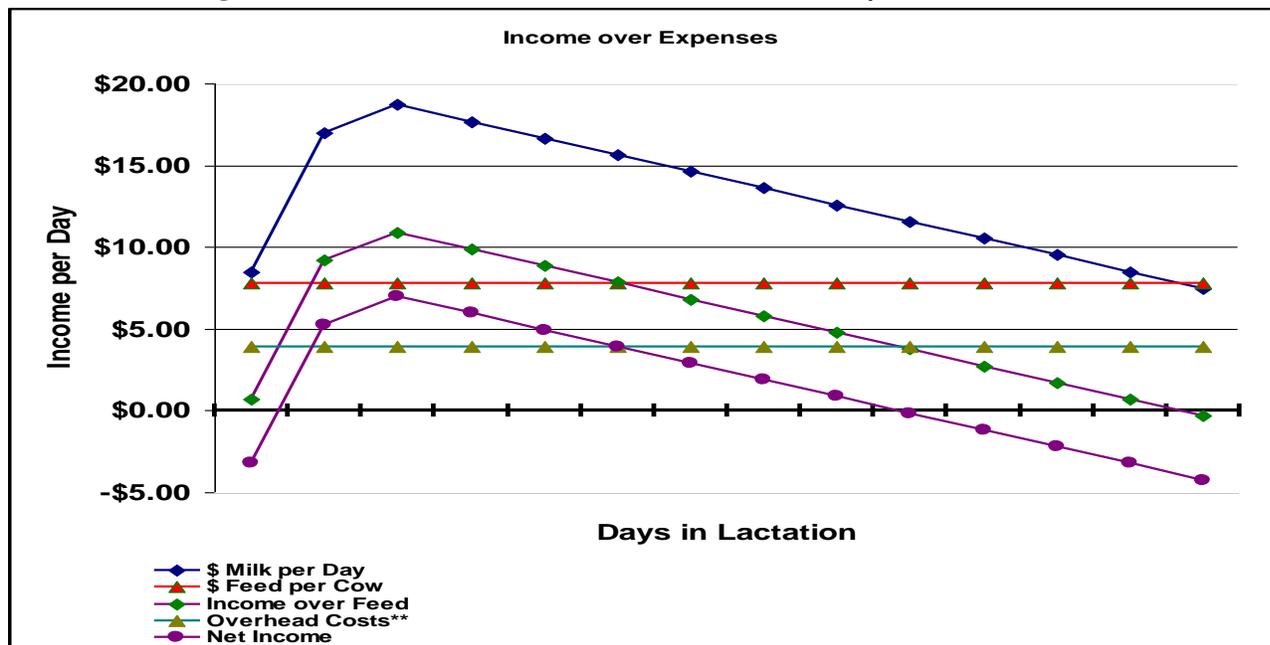


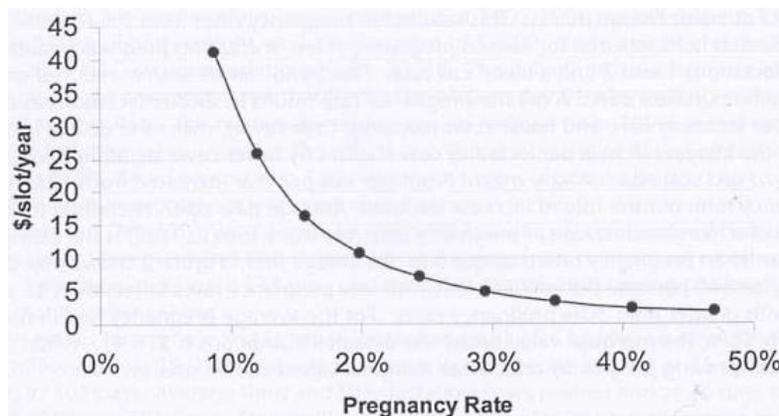
Figure 1 reveals the true break even Net Income for later lactation cows. Days in milk of 270-300 is a common break point that also correlates with the conventional 305-d standard lactation. For years dairy producers have measured cows' return based on covering feed costs, but a cow must also cover variable costs (ranging from 25 to 30 % of milk sales) to contribute to herd profitability. This example uses a 110 lb peak milk with a normal lactation curve drop of 0.17 to 0.20 lb/d. The \$ Feed per Cow are estimated at \$7.80/cow/d. The Overhead Costs are estimated at \$3.81/cow/d. The milk price used was \$17.00/cwt.

Cows not pregnant reach a net margin point of no return at the 270-300 d mark. The negative margins must be either appropriated back to the rest of the herd or deducted from her beef salvage value. Looking at the beef check as a *cookie jar*, she is stealing from the cookie jar at this point. The maximum profit will be realized if the nonpregnant cow is culled when she crosses the breakeven point. Lenders need to address this when requiring cows that are unprofitable to be held to satisfy herd count minimums as collateral.

Improved reproductive performance will address these issues by reducing the number of days in late lactation for the herd, providing additional fresh cows, providing more voluntary culling vs. involuntary culling, and increasing the number of replacements. Reproductive results need to be optimally timed, as breeding cows too soon reduces peak milk as the cow maintains a pregnancy as well as milk production demands. Balancing these facets is manageable with improved heat detection and breeding results.

In herds with low reproductive performance, the value per point of improved pregnancy rate is significantly more than \$40.00 per cow per point per year. (Figure 2). In herds with high reproductive performance, over 30 % pregnancy rate, the value of a one point increase is \$5.00. There is a diminishing return at the upper levels. This can also reduce profitability in the extreme cases when cows are dried off at high levels of production. Again balance is the key here. Figure 1 shows that as pregnancy rates improve, marginal cows can be culled voluntarily if they reach late lactation with a short day pregnancy, favoring a cow with higher production and

Figure 2. Value per cow per year of improving pregnancy rate.



reproductive status to take her place. In the low result herds additional replacement costs take up profits and production suffers.

THE BASICS FIRST

The key to good production is forage quality and good nutrition as a basic requirement for sound reproductive results. Next is cow comfort and proper stocking density, comfortable cows are under less stress and more apt to achieve pregnancy and maintain milk production. Cleanliness and proper semen handling techniques are often areas that need improvement and should be reviewed on a routine basis. Using good bulls with positive economic and health traits will also make the feeding investment in young stock profitable and productive. These are basic issues that need to be evaluated on the dairy for optimal results.

Also the dairy needs to find the optimum management style and protocol to match the skills, strengths, and resources unique to that dairy. What works for one producer doesn't work for all producers. The most important thing in successful outcomes is your **ATTITUDE**. The underlying condition on dairies that excel in reproduction is a commitment and passion to get cows bred on time. If it is important to you that your people understand this. The training, tools, and time must be allocated to get results. If you have a passion for positive results it is contagious in your organization.

The only number that matters when evaluating reproductive performance is: How many pregnant cows did we get this week! For 1000 cows we need to get 20-22 pregnant cows each week. And we get a report card at every vet check. We can measure it and we can manage it!!

THE TOOLS

There are many strategies used to get cows bred; from crossbreeding, to synchronization protocols, to using young sires, to using herd bulls, to changing the breeder, to using the latest feed ingredient, to using activity monitors to detect heat. Sad to say there are no silver bullets or magic wands. But we can use sound principles and consistent protocols to achieve high pregnancy rates and to keep a higher percentage of the herd in the positive portion of the lactation curve.

RAISING THE BAR

The national average heat detection rate (**HDR**) is stated at close to 50 %, which means we are missing half of the heats each day in the national herd. The average pregnancy rate is stated at 14-16 %. This means we need to change the way we are breeding cows to elevate our competitive position in a competitive world market. One of the best ways to raise a pregnancy rate is to breed more cows, better yet to breed more cows that are detected in heat. The timing of insemination to the cow's behavior and expression of higher activity/estrus gives us a tool to automatically determine the proper time to breed the cow and raise reproductive performance. Proper use of activity monitors can raise HDR and pregnancy rates consistently in free stalls and dry lots alike, with or without synchronization protocols.

ACTIVITY MONITORING

There are several different activity monitors on the market. Some are neck mounted, which make it easy to manage tags in lock-up stanchions or palpation rails. Some are leg mounted to be managed in the milking parlor. Some have long life batteries which are sealed to extend tag life.

Some require the batteries to be changed by the dairy producer. Some are read by antennas in the free stalls or dry lots, others are required to pass through an ID portal usually in the milking parlor. Some tags send information hourly with 24 h of data, some count steps and are read at milking. Though the characteristics vary between the different brands, **the basic fact is that activity monitoring works and has a proven track record of detecting additional cows in heat thus raising reproductive performance.** Activity systems historically can raise HDR and pregnancy rates to return investment dollars in 12 to 24 mo when used properly. Though results may vary with management conditions.

Activity systems collect movement of the cow and compare the values to her average movement for the similar time frame of previous days. This *deviation from average* is used to calculate a value which when certain thresholds are met, indicates

the cow to be in heat. With higher producing cows, estrous cycles can be of shorter duration and detecting mounts more difficult; yet in these cows an increase in movement during estrus is normally detectable with activity monitoring. This is a key benefit of activity monitoring. The data is collected and processed so lists of cows ready to breed can be printed and distributed to the AI technician. Visible graphs can also be reviewed on cows with more subtle deviations.

If you are considering an activity system (Figure 3), accuracy in tag management is essential to good results. Adherence to accurate data entry and correct tag placement is a critical discipline. Tags can be placed on all cows or in situations where investment dollars are tight a 60 % tagging rate is workable, with tags being moved from pregnant cows to recently fresh cows. This requires moving tags, but it can work well.

Figure 3. Key questions when comparing activity monitoring systems.

Comparing Activity Systems

- Where the tag is located?
- How long does the battery last?
- How often is information collected?
- How is information sent?
- How is the data complied?
- Who handles support?
- Warranty on the tags?

Figure 4. A sample reproductive protocol.

A Successful Example

- Lut 1 49-55 DIM
- Lut 2 63-69 DIM - Breed detected heats
- Remaining cows not bred enter into Ovsynch
- Breed all detected heats
- Cows not inseminated yet, TAI as protocol determines.
- Detect all heats of repeats and breed.
- Take advantage of all tools available

DeLaval Activity System



PROTOCOLS AND STRATEGY

Through the years, the forces in the industry have argued what was the best tool to get the job done. In my opinion it makes sense to use every tool available to maximize the results on your dairy. Protocols that can be incorporated into a work routine that you are committed to and able to implement consistently yield good results. Following is a protocol used on a dairy I worked on and consulted with over the last 7 yr that has maintained a 28-31 % pregnancy rate since 2005 with a HDR of 70-74 % in that same period. A DeLaval Activity System is used along with a modified Synch protocol.

This herd was a full PreSynch OvSynch herd that was time bred. The pregnancy rate was 23 % and the HDR was 65 % in 2004.

The protocol in Figure 4 works by delaying the Lut 1 shot by 10 d and places the cows that respond to the Lut 2 shot at the start of the voluntary wait period (**VWP**). We breed 60-70 % of the cows on a detected heat, which saves \$10.50 (2 GNRH shots and the Lut 3 shot) in pharmaceutical costs on those cows. The remaining cows are enrolled into Ovsynch and all cows detected in heat are bred. The advantage of this simple protocol is that any repeat heats are detected by the activity system and those cows are bred without waiting for the next pregnancy check to find them open. It also creates a backstop for cows that are not cycling on their own and a percentage of these are time bred at 88-93 DIM. The percent open at 150 DIM has been consistently in the 9-11 % range with < 1 % do not breed (**DNB**) cows. Over the past 7 yr we have also consistently seen a 5-7 % higher conception rate on the detected heats vs the timed AI breedings.

Figure 5. Activity monitoring systems as an aide for reproductive management.

Introduction

- Activity Systems

- Activity Systems offer dairy herds the best Heat Detection, for better Breeding Efficiency and shorter Calving Interval, to improve efficiency and profitability.

- All Activity Systems will catch cows in heat.

- Accuracy and Product Life are Important.

DeLaval Activity System



SUMMARY

Activity monitoring is a successful strategy whether used alone or in conjunction with synchronization protocols. The tools compliment each other and can be used separately or together, depending on the needs of the dairy. Organic dairies would see a good benefit with straight activity monitoring.

Activity monitoring can be an inexpensive first step to a modular approach to full herd management, adding ISO Ear Tag ID, sort gates, and milk meters to perfect voluntary culling.