

*A Reproductive  
Moment With*

**MEL**

# THE RULES HAVE CHANGED

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**W**hen was the first time someone told you that in order to remain profitable in the dairy industry you must catch 70% of the eligible heats in your herd, obtain 60% conception rates at first service and maintain a 12-12 month calving interval? When was the last time you actually achieved these goals? The rules of the thumb we typically use to gauge the success of our reproductive management programs were developed when the average herd had 40-50 cows and averaged <12,000 pounds of milk per lactation. However, recent DHIA summaries suggest the average dairy herd on test in the United States is now on the order of 130 cows and maintains a rolling herd average for milk production of about 19,000 pounds. Herds averaging in excess of 25,000 pounds of milk have become common.

Unfortunately, along with increasing herd size and milk production levels have come increased stress on the cows and reduced reproductive efficiency. While the specific causes for reduced reproductive performance in today's dairy herds are the subject of considerable debate, it's clear the average dairy of today is quite different than the average dairy of 20 years ago. Let's discuss why some of the age-old gauges of reproductive performance may not accurately reflect the true success of reproductive management programs in today's large dairy.

## HEAT DETECTION EFFICIENCY

Reduced efficiency and accuracy of estrus detection has likely been a significant contributor to reduced reproductive performance over the years. When we moved from 40-50 cows in dirt lots to several hundred cows on concrete, the rules of heat detection changed. More cows in a high stress environment on a footing surface that's not conducive to mounting behavior, means we have to spend more time per cow and will probably still fall short of our goal for estrus detection efficiency. Heat detection these days is usually the responsibility of hired labor opposed to yesteryear when a person with a vested interest in the operation was watching the cows (herd-owner or family member). Recent DHIA summaries suggest the average dairy producer today only catches 50% of the eligible heats in his herd.

Tail chalking and/or estrus synchronization have been adopted in many herds to help improve estrus detection efficiency and reproductive performance. While these management techniques do often improve reproductive efficiency, they can also cause problems in deciphering our typical benchmarks for reproductive performance. For example, a typical barometer of estrus detection efficiency has always been average days to first service (goal < 75 days). However, in a herd using the Ovsynch fixed time A.I. protocol, days to first service can be predetermined at the time of calving. Although all animals may be inseminated in a timely fashion, that does not mean they are getting pregnant. Thus, in herds using Ovsynch, days to first service is of little value in gauging reproductive performance.

Another typical measure of heat detection efficiency is the inter-estrus interval (number of days from one heat or insemination to the next). However, in herds with good heat detection, prostaglandin usage prior to the voluntary waiting period or after pregnancy checks may result in a relatively high percentage of both short and long inter-estrus intervals. Again, this does not automatically mean there is a problem.

## SERVICES PER CONCEPTION

Services per conception has histori-

cally been an indicator of the competency of the inseminator and the insemination process. However, in herds that breed strictly off tail chalk signs, service per conception is more likely a reflection of the accuracy the chalk interpretation. In some chalking herds, as much as 20% of the animals presented for A.I. were not really in heat. Nothing drives up services per conception like breeding pregnant cows or cows not in heat. While our goal for services per conception should remain <2.0, greater than 2.0 services per conception may not necessarily indicate a drastic problem if the services are occurring soon enough after the voluntary waiting period to keep days open to a reasonable length.

## DAYS OPEN

Average days open is another benchmark indicator of reproductive performance that has limitations in interpretation. In the past, the rule was that cows open in excess 90-100 days were costing you money due to lost milk production. While these numbers probably still apply for most herds, they may not be realistic for the highest producing cows (herds) of today. The ability of bST to add profitability to extended lactations adds another wrinkle to the equation. Thus, the entire concept of what is the appropriate calving interval for high producing herds (cows) has recently been the subject of considerable controversy. Depending on milk production levels, seasonal variation in milk prices, feed costs, replacement costs, season of calving and whom you ask, the answers will change from one herd (cow) to the next. Also, even though a high percentage of cows may conceive in a timely fashion, a small percentage of cull cows that are late in lactation may cause days open to appear artificially high if included in calculations. To use an extreme example, if 10% of the cows in a herd are open, bST injected culls averaging 350 days in milk and the other 90% were all pregnant before 125 day in milk, average days open will increase (decrease) by 25 days by inclusion (exclusion) of these animals in calculations.

## PREGNANCY RATE

The most meaningful variable in gauging reproductive performance in

today's dairy herd is a variable called the "Effective Pregnancy Rate" (EPR). The EPR is the number of animals that became pregnant during a specified period of time (usually 21 days) divided by the number of animals that were eligible for breeding during that period. EPR may also be expressed as the percentage of the herd pregnant by different time

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intervals post-calving (100 or 150 days in milk). Expressed in another fashion, EPR is simply the percentage of eligible animals presented for insemination (heat detection efficiency) multiplied by the conception rate per A.I. The effective pregnancy rate has the advantage of being an all-encompassing indicator of your herd's reproductive performance. It doesn't matter if animals were bred to standing estrus or to Ovsynch, first service or to a repeat insemination as long as they got pregnant within our breeding window.

In Figure 1, the cumulative pregnancy rate of a herd that achieves our historic goals of 75% estrus detection efficiency and 60% conception rate A.I. (45% EPR) is compared to one that DHIA processing centers would consider an "average" herd of today (50% heat detection efficiency x 50% conception = 25% EPR). According to ideal standards (45% EPR), 70% of

the herd should be pregnant by 100 days in milk and 92% should be pregnant by 150 days in milk. However, with an EPR of 25%, the "average" herd will struggle to approach 70% pregnant by 150 days in milk.

Effective pregnancy rate is not a new concept, it's always been important. In the past however, we've mainly focused on the

individual components of EPR (heat detection efficiency and conception rate) when it's the end result that's really most important. A conception rate of 60-70% is of little value if only 30% of your animals are detected in estrus (< 21% EPR). Likewise, an 80% estrus detection efficiency is of little value if conception rates per A.I. are <30% (24% EPR).

Failing to recognize the value of EPR in gauging reproductive efficiency may explain why many producers have failed to realize the potential economic benefits of incorporating the Ovsynch timed A.I. protocol into their herds. The Ovsynch protocol typically averages 30-35% pregnancy rate in most herds. Many herd owners conclude that this fertility level is unacceptable because they typically achieve 50% conception rates per A.I. The fact that the 50% conception rate is only applied to the 40 or 50% of the herd detected in estrus is often overlooked. Thus, after 21 days of continuous

estrus detection, the EPR of this herd is < 25%. If you now consider a 30- 35% pregnant rate following a single fixed time A.I. with no days spent for heat detection, the Ovsynch program looks a little more enticing. With no other management

changes, a herd that maintains a 25% EPR and treats all cows with Ovsynch at the end of the voluntary waiting period (60 days) should increase the percent cows pregnant by 100 days in milk from 40-50% to the 60-65% range (Figure 1). In such a herd, using Ovsynch is like starting a baseball game with 30 - 35 runs in the first inning. It doesn't guarantee a win, but, sure gives a nice comfort zone.

Ovsynch is obviously not the only answer, nor necessarily the best answer, for everyone's breeding problems. Increasing heat detection efficiency and / or conception rate are almost always the preferred method of improving EPR. Prostaglandin injections at the VWP (Target Breeding) and following an open pregnancy diagnosis can be more effective and cost effective than Ovsynch if heat detection is sufficiently intense during the synchronized period to catch these animals as they respond. However, if despite your best efforts your heat detection program still fails to meet expectations, Ovsynch is a viable alternative.

Although the EPR is an outstanding method of gauging the overall efficiency of your reproductive management program, it does not clearly indicate where a potential fertility problem resides. To troubleshoot a fertility problem, we must still determine if it is an estrus detection problem or a conception rate problem.

When considering implementation of new procedures in your reproductive management program, you must first be totally honest with the evaluation of procedures currently in place. Don't think staunchly in terms of how many cows were detected in estrus or how many services per conception are required. Go straight to the bottom line: Within the same amount of time, what percentage of open animals became pregnant with Technique A vs. Technique B? The economics of what it costs to achieve these results can then be calculated on a per pregnancy basis. The profitability of your dairy operation depends on EPR more than any other reproductive variable you can measure. ♦

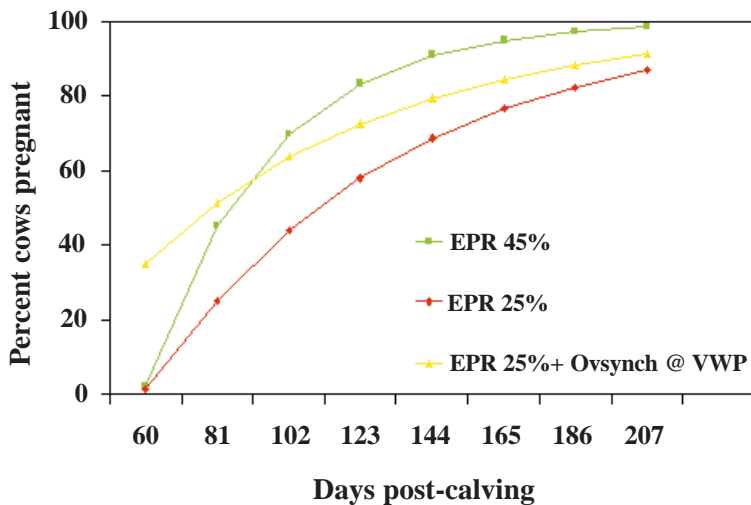


Figure 1. Cumulative pregnancy rates in response to varying effective pregnancy rates (EPR).