PART 3: Monitoring Transition Cows

This month we conclude our discussion on monitoring by discussing the advantages and disadvantages of many of the typical monitoring parameters.

Peak Milk

Peak milk has long been used as a monitor of fresh cow performance. Unfortunately, it has many limitations as a fresh cow monitor. The discussion here assumes the question of interest is "How are my recently fresh cows performing?" There are, however limitations of using the peak milk measurement as a fresh cow monitor include.

DHIA's typically do not report "true" peak milk, i.e., the highest milk production that the cow will produce this lactation. **Usually the number reported is the highest milk produced at any testday so far during the current lactation. This can vary considerably from "true" peak milk, as it is not likely that DHIA testday will coincide with the actual peak milk day for very many cows.**

Even if "true" peak milk is being reported, it is difficult to compare one cow to another since the expected peak varies with multiple factors, including:

- Age at freshening
- Lactation number
- Season calving
- Breed of cow
- Area of country
- Herd production level (small effect)

Problems with Peak Milk

The presence of these influences must be accounted for before meaningful comparisons can be made between animals or groups of animals. On a practical level, these adjustments are quite difficult to make mentally.

There is considerable **lag** from the time a cow freshens until her peak milk. Since peak milk usually occurs somewhere between 50-90 DIM, this time interval is the lag between what we are trying to measure (fresh cow performance) and the time of the measurement itself (peak milk). This is too long to wait for prompt detection of fresh cow problems. Variations such as summit milk have the same problem with lag.

Often peak milks are reported simply as means **(averages)** with no indication of the underlying range of values; i.e., with no sense of the variation.

These peak milk measurements often include more than the recently fresh animals, lending the dampening effects of **momentum**.

By either the true or highest test-day peak milk definition, a cow must survive long enough in the herd to reach second or third test to have a recorded peak milk. This is a form of **bias**, as it excludes the performance of cows that either left the herd prior to peak milk or those cows currently at first test.

First Test-Day Percent Butter Fat

Higher than "normal" butterfats in individual cows is often a sign of metabolic difficulties. These cows usually are in a state of extremely rapid weight loss. These cows often have a history of metabolic problems such as ketosis, fatty liver, and/or displaced abomasum. Cut-off points at present are not clearly defined, but Holsteins with tests above 6.0% should be investigated further.

Lower than "normal" butterfats in individual cows is often a sign of past metabolic difficulties, low body condition score, acidosis, or some combination of the three. These cows usually are very thin. In many cases, these cows are 20-30 days in milk at first test. We propose that many of these cows would have been quite high if tested at day 8-15, but now are low since essential no more body fat is available to be lost into the milk.

This likely under-reports problems in cows that are dropping from a "high" to a "low" test as they would not be distinguishable from "normal" cows.

First Test-Day Linear SCC

Unpublished data currently being evaluated suggest animals starting with a higher linear SCC (>4.0) produce 1,000-1,500 pounds less in the coming lactation when compared to cows freshening with lower linear SCC. In addition, recent reports suggest that cows with mastitis in early lactation have lower reproductive performance.

First Test-Day Mature Equivalent 305-day Projected Milk

All DHIA's offer projections (predictions) of the expected lactation total 305 day milk production. A mature equivalent (ME) projection further refines this prediction by adjusting all cows to the same age to allow comparison of cows in different lactations.

Some DHIA's begin predicting a cow's 305 day ME projection at the cow's first test of the lactation. The cow must be at least 8 days in milk to receive a first projection. Typically, cows are around 15-20 days in milk at first test.

While this projection is not 100% accurate in predicting the final 305 completed lactation total milk, it is much better than is commonly believed. A cow starting with a low projection at first test is not likely to finish with an excellent total at the end of 305 days and is much more likely to be culled.

Compared to peak milk, the first test-day 305 day ME projection offers these advantages:

1. Measurement can be made starting at day 8, gaining 45-60 days on lag time.
2. Bias due to culled cow exclusion, although still present, is less.
3. Effect of different test-day days-in-milk is removed.
4. Cows freshening at different ages can be compared one to another.
5. Cows in different lactation numbers can be compared.
6. Cows freshening in different seasons can be compared.
7. Cows freshening in different areas of the country can be compared.
8. Different breeds can be compared.

Adjustment is made for herd productivity.

MONITORING QUESTIONS

To some extent, this discussion has been organized backwards. Common measures were discussed prior to asking the questions, in part to reinforce the potential problems with these measures. But the fundamental questions should include the following:

- Are cows milking OK - both milk volume and milk components.
- Have disease levels changed?
- Are disease levels too high?

Better Monitors

To promptly assess milk yield, daily meters are useful, both for individual cows (for disease detection), and averages of the fresh cows (for recent transition program changes). Although most new construction includes daily meters, the vast majority of dairies must rely on monthly testing. In-line turbine meters can provide group totals, but those are not yet in wide use either.

As mentioned above, waiting until peak milk has been achieved incurs too long lag time. On the other hand, the milk yield and component values on the first test day are significantly affected by both days-in-milk and fresh-cow diseases. Typically DHIA does not sample cows in the first week of lactation. Also, some dairies do not record milk weights for diseased cows, which can bias the results. The first projected 305 is useful to track over time. Typically, either the monthly average by lactation group, or a scatter graph of first production index (Milk, %Fat, pr305ME) by fresh date is useful.

When accurate disease records are available, there are likely few more sensitive monitors for assessing transition programs. Either counts by month, or histograms of incidence rates of the common fresh cow diseases are excellent tools. Depending on the size of the dairy, either weekly or monthly counts are usually sufficient to detect and assess changes.

Purists would actually prefer incidence rates, where the denominator is some measure of the cows-at-risk. However, in herds without extreme seasonal calving patterns, a count is usually sufficiently sensitive to screen for a problem.

Charting these disease events by days-in-milk is instructive to assess the average issues last year, but as a general rule, any monitor that uses an entire years wait to accumulate data has significant momentum, and is not suitable for the dynamic monitoring that is necessary.

Proxies if no disease data are available

Few dairies keep accurate disease data. Even fewer DHIA's provide access to these data by consultants or advisors. (Dairy One in New York and Minnesota DHIA are exceptions). Because of the absence of disease data, many lenders and other dairy advisors tried to use annualized cull rates (or reasons) as a proxy for disease morbidity and mortality. Unfortunately, there is no monitoring value in cull rates, either level or stated reasons. There is no such thing as an optimal cull rate, and sometimes even a herd with a high cull rate has cows in the herd that should be replaced. Likewise, a herd with a low cull rate may just not understand the opportunity cost they incur by keeping cows in the herds when a replacement would be more profitable. A cow culled in the first month of lactation is a far more expensive economic event than a cow that is replaced at the end of lactation. Some estimate that the cow value drops about $3 per day after freshening for cows that do not become pregnant.

Culling reasons reported to DHIA are not useful. Although they are rarely coded correctly, that is not the reason why they should be ignored (and actually, not even recorded). Waiting a year to learn about problems by looking at cows that are sold is too late. In every single category, there are far superior choices for monitoring performance. The economic loss suffered from sub-optimal performance likely exceeds the economic loss indicated by the cows that actually left the herd. That is, the morbidity is likely just the tip iceberg of economic losses from diseases.

For example, any guess of the number of cows culled for reproduction is likely an indirect estimate of problems that happened many months ago. Using recent pregnancy rate and recent heat detection rate make far more sense. Waiting for a year to see how many cows died from mastitis is a horrible monitor of either clinical or sub-clinical mastitis. It is easy to find numerous superior tools for monitoring a problem on a dairy.

Other Performance Monitors

Up to now, this discussion has been focused on monitoring outcome - how did milk production change, has there been more diseases, etc. However, it is also important to monitor processes - are systems being followed as expected? These "causal" monitors include the length of time cows spend in the close-up pen, and a distribution of the length of time that a cows is dry. These monitors will be earlier measures of compliance issues with procedures than actually waiting for the effects of these problems.

Fresh Cow-Care Monitoring

On larger farms it can be instructive to track the person responsible for freshening each cow. Large differences in future production and disease incidence can occur on the same dairy with different persons assisting calving. These differences may arise for many reasons, including immediate post-partum cow access to fresh water, immediate and plentiful access to high quality long forage, calving hygiene, calving trauma, degree of calving trauma, degree of calmness handling the cow, and attention to bedding dryness and cleanliness.

Conclusion

In the end, there are limited things a dairy can change. They include the transition program, ration and feed delivery, cow comfort, milking equipment and procedures, reproductive programs, and better organized labor efforts, including protocols for diagnosing, recording and treating diseases. On the other hand, change will be continual on most dairies, be they intended intervention or an unintended interruption. Using monitors that promptly and accurately describe the impact of these changes should result in continued improvement and profitability.

For more information, call Dairy One at 1.800.496.3344 or email: dmr@dairyone.com

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