

Monitoring Udder Health in Robotic Milked Herds

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Robotic milking changes the way things are done on a dairy farm by adding greater precision to many tasks. Not only does it add precision to what we do, it can also add precision to how we think, and mastitis is no exception.

Assessing bacterial invasion of the udder (mastitis) by testing for inflammation in the milk has been done routinely for over 30 years by doing somatic cell counts (SCCs) in cow milk samples. Newer technologies have arrived with robots but do not replace the information we get from established SCC programs. While producers would like to have one test that answers all mastitis questions, that is unlikely to happen. Not all mastitis is the same, nor are the problem with mastitis the same from farm to farm.

As we hone our approaches to deal with a variety of mastitis issues, the tests we need are those that:

1. Detect clinical mastitis so that proper intervention can occur for affected cows and so abnormal milk (milk not for human consumption) is kept out of the bulk tank.
2. Detect cows with high SCCs so their milk can be diverted from the bulk tank, so milk sold will have low SCCs.
3. Identify patterns of mastitis so that we can take preventive action and be able to tell if it worked.

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Clinical mastitis (CM) is visible mastitis meaning changes in the milk or cow occur. Two systems can detect CM. Traditionally, observation of the cows and the milk at milking time by milking staff has been the way. With robotically milked herds, people are not involved at milking time – these systems must incorporate CM detection technology such as electrical conductivity (EC), colour change or metabolic changes (LDH) to take the place of the people no longer present at milking time. To date most of these technologies have not been completely satisfactory. Research on EC systems (algorithms are used to combine test results and cow history) where comparisons to standard tests for CM is done shows that the test sensitivity, the proportion of CM cases detected, ranges from 50 to 90%. Unfortunately the trade-off for tests with a higher detection rate is a higher false positive rate, sometimes up to 50% of signals. The high false positive rate remains a frustration on many farms, especially if the farm has mostly mild mastitis cases that rarely require therapy.

Subclinical mastitis (SCM), where inflammation is present but there are no visible changes in milk or the cow, is far more economically important on most farms than clinical mastitis. SCM can occur, causing significant reduction in milk production without a producer's

knowledge and thus prevention of future cases does not occur. As cases accumulate, the bulk tank milk SCC rises and the quality of the milk sold is reduced. Since there is no visible warning to trigger sampling for testing, detection of SCM requires routine SCC testing, as provided by monthly DHI program. Appropriate testing for SCM is currently lacking on robotically milked herds not enrolled in DHI SCC testing.

Monthly SCC testing has proven to be a cost-effective way of screening for SCM. While cows with CM certainly have high SCCs, because the DHI testing occurs at monthly intervals not all cows with CM will be detected. Detecting CM has never been the objective of the DHI SCC system. The DHI SCC testing monitors SCM, those cases where cows have high SCCs that last from weeks to months but show no visible signs.

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What really adds value to the DHI SCC system is the ability to track udder health over time – the ability to see the herd's mastitis rate this month compared to last month, last season, or even last year at the same time. Collating and summarizing the data over time to evaluate cows grouped by lactation stages, age or by other risk groups in the herd is what really counts. When changes are made to management, milking procedures or to housing to improve udder health, it's the cow SCC results summarized at the herd level that show whether or not success has occurred.

Cow side tests to detect CM can't replace DHI monthly SCC as an ongoing monitor of SCM and herd udder health performance. Recognition of the difference in information that the two systems provide is important to producers, herd advisors and the milking equipment industry. Without monthly SCC testing and information assessment, herd owners have no mastitis history on their herd. When seeking to reduce BMSCC, evaluating the herd SCC history to identify problem areas is the first step towards timely and cost-effective intervention.

Cow side tests to detect clinical mastitis, can't replace DHI monthly SCC which monitors subclinical mastitis.

For robotically milked herds, to detect CM, continuous (daily) cow-side testing is a good system. For conventionally milked herds, examination of the cow and milk at every milking works well. For both kinds of herds, recording of CM data is needed for proper treatment and prevention decisions. For detecting SCM, routine testing of all cows using the only validated system we have, the monthly DHI SCC testing, is essential for both robotic and conventionally milked herds. All farms need both systems to be assured of adequately monitoring mastitis rates and ensuring good milk quality and cow health.