

Fresh period poses risk for mastitis

By Frank Welcome and Dani Thon

The infection status of individual cows and the herd as a whole at freshening will set the tone for milk quality and udder health for the lactation

The weeks following calving represent the greatest risk for mastitis in dairy cattle. The spike shown in Figure 1 confirms how prevalent first cases of mastitis are early in lactation for a typical herd.

Why is it important to address this situation? Because the numbers of clinical mastitis cases and, more importantly, the numbers of subclinical mastitis cases set the tone for udder health and milk quality for the entire lactation.

There are a variety of factors that place recently freshened animals, including heifers, at risk for udder infection:

- The depressed immune status of cattle during the dry period and for several weeks after calving.
- The high new infection rate characteristic of the dry period.
- The challenges of the stressors associated with transition to lactation. These stressors may include overcrowding, metabolic problems such as ketosis, and other post-calving infections including metritis.

The importance of dry period infections and their influence on fresh cow mastitis were well described in September's QM² from Quality Milk Production Services and Dairy One. However, it's important to repeat the somatic cell count (SCC) guidelines for herds to achieve high quality milk, defined as a bulk tank SCC (BTSCC) no higher than 200,000.

■ Using a linear score of 4.5 (SCC ≈ 280,000 cells/ml) or greater as a cut off to indicate infection, no more than 15% of the animals should have that score at first test after calving (LS1). This is referred to as the HiFresh Infection Rate.

■ 5% or less of the herd should show signs of clinical mastitis within the first 30 days of calving.

Other fresh cow health issues, including ketosis and metritis, can predispose cows to mastitis. Research in Ontario and the United States has shown that cows with ketosis are at least twice as likely to develop mastitis as cows without ketosis. The severity of mastitis infections in ketotic cows is also likely to be much more severe than in cows without ketosis.

Herds that measure individual cow SCC through DHIA have an excellent tool to measure and monitor test day infection rates, including what is often referred

to as a HiFresh Rate. This is a gauge of infections that occur during the dry period and immediately after calving. But the HiFresh infection rate doesn't distinguish between dry period infections and those that occur between calving and the first test day after calving. This interval will be four weeks or more in most herds.

When you observe an elevated HiFresh Infection Rate trend, evaluate both dry cow and immediate post-calving management and facilities.

Management practices

The management and sanitation of calving pens are critically important. Pens must be clean, dry and well-bedded. Overcrowding can escalate the risk for new clinical and subclinical infections. Overcrowded and unsanitary pens also put animals at risk for other post-calving infections such as metritis. In group pens, shoot for 80 square feet or more per cow.

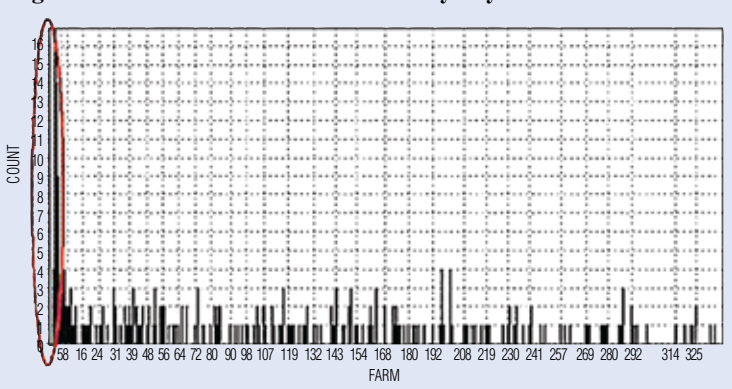
An increase in metritis or ketosis can indicate a need to monitor SCC more closely.

Recent QMPS research is unveiling the mechanisms that prevent dry cows infected during the dry period from showing signs of clinical infection until after calving. Diagnostic methods such as DNA fingerprinting clearly show that quarters can be infected during the dry period, but a clinical case of mastitis may not occur for many weeks after calving.

Researchers now consider these dry period infections to be responsible for many, if not the majority, of fresh cow clinical infections shown in Figure 1.

The therapeutic effects of dry cow therapy are greatly diminished in the later weeks of the dry period, and absence of daily milking creates an opportunity for late dry period infections to become

Figure 1. First case of clinical mastitis by days in milk



more established in the udder. For many cows the only indication of infection after calving will be an elevated cell count. These infections have a tendency to be more chronic than those new infections that occur after calving.

Dry period infections

They often persist for months, if not for the entire lactation. These chronic infections associated with an elevated first test linear score contribute high numbers of somatic cells to the bulk tank, day in and day out throughout lactation, decreasing milk quality and value. Many of these infections often result in clinical mastitis cases later in lactation.

Many of the cows with elevated cell counts at first test will eliminate the infections within a few weeks after calving without intramammary treatment. You can easily evaluate these spontaneous cure rates by reviewing consecutive test day linear scores after calving. A linear score greater than 4.5 indicates an infection; the linear score of "cured" animals will be below 3.0 at the next test day. Spontaneous cures are more common in first lactation animals.

The most common mastitis pathogen identified in fresh heifers is *Staphylococcus* species, which is not to be confused with *Staphylococcus aureus*. Staph species usually originates from the environment and for the most part, most infected heifers can eliminate the infection by the next test period. For a period of weeks after calving, these animals may contribute a substantial number of cells to the BTSCC and decrease the value of milk.

If the portion of first lactation animals infected at first test is consistently high – say 30% or more – no progress will be made in lowering the BTSCC as each animal cured during lactation is replaced by a new infected fresh heifer.

Many dairy producers have successfully incorporated pre-calving treatment of heifers to eliminate these infections. However, this strategy for managing milk quality presents risks to both animals and the people administering the treatment.

The spontaneous cure rates for first test after calving of most herds should be relatively high – 60% or more. If cure rates are low, you need to investigate further to identify the specific mastitis pathogen involved.

Infections caused by common contagious mastitis pathogens – *Streptococcus agalactiae*, *Staphylococcus aureus* and *Mycoplasma* – and some environmental pathogens such as *Klebsiella* species are characterized by very low spontaneous cure rates. Totally different mastitis and milk quality control strategies are necessary to manage these types of infections.

The transition from late pregnancy to lactation is a critical period for managing mastitis and milk quality. The infection status of individuals and the herd as a whole at freshening will set the tone for milk quality and udder health for the lactation.

Monitoring linear scores at first test after calving will help you identify existing and emerging udder health issues. You can use the same information to

evaluate the success or failure of management changes to reduce the risk for new infections, improve milk quality and increase the value of milk.

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How to reach us...

Frank Welcome is a veterinarian with QMPS in its Ithaca lab. Reach him at 607-255-8202. Email: flw2@cornell.edu

Dani Thon is with Dairy One's Management Resource Group. She can be reached at 800-344-2697

QMPS is a program within the Animal Health Diagnostic Center, a partnership between the New York State Department of Agriculture and Markets and the College of Veterinary Medicine at Cornell.

The QMPS staff of veterinarians, technicians and researchers works with New York dairies to improve milk quality by addressing high somatic cell counts, milking equipment and procedures, and milker training in English and Spanish. QMPS also conducts research and teaching programs.

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Dairy One is an information technology cooperative, providing DHI records services and herd management software to dairies throughout the Northeast and Mid-Atlantic region. A comprehensive laboratory network provides milk quality testing as well as forage, soil, manure and water testing.

Contact Dairy One Cooperative Inc. at 730 Warren Rd., Ithaca, N.Y. 14850. Tel: 800-344-2697. Email: dmr@dairyone.com
Website: www.dairyone.com

The next issue of QM² will appear in the January issue of *Eastern DairyBusiness*.

Figure 2. Test day HiFresh infection rate - Herd A

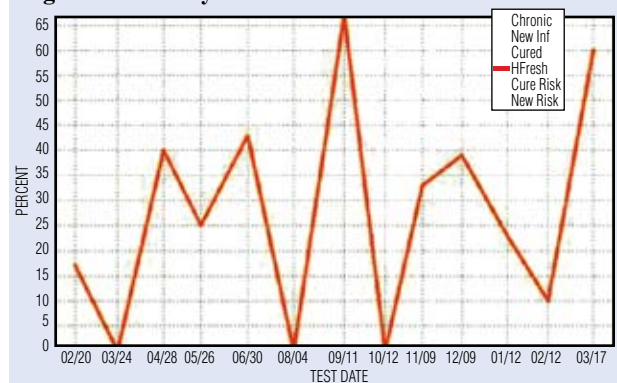
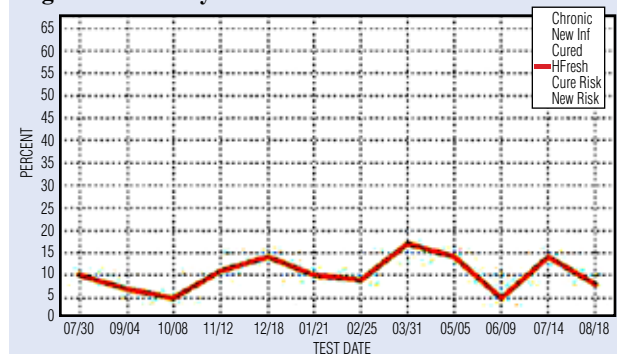


Figure 3. Test day HiFresh infection rate - Herd B



HiFresh Rate is the infection rate present in cows at first test after calving. Because it measures new infections that occur during the dry period and immediately after calving, it's an important number to monitor. Herd A has a test day average SCC of 500,000 cells/ml; Herd B consistently maintains a test day average SCC of less than 200,000 cells/ml. The portion of the herd with linear scores greater than 4.5 has a significant impact on bulk tank SCC levels.