



UDDER TOPICS

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NMC's 2020 Regional Meeting Rescheduled to April 2021

Due to the COVID-19 pandemic, National Mastitis Council (NMC) canceled its May 6-8, 2020 Regional Meeting and rescheduled it for April 20-22, 2021. The venue remains the Visalia Marriott at The Convention Center in Visalia, Calif.

"While it's disappointing to cancel this year's regional meeting, the safety of NMC members, attendees, industry partners and the communities we serve is our top priority," said Alfonso Lago, NMC board member and NMC Regional Meeting program chair. "We look forward to hosting you next year in The Golden State – the top milk-producing state in the United States."

Tentatively, NMC plans to hold short courses on April 20, general session presentations all day on April 21 and the morning of April 22, and tour a couple dairies the afternoon of April 22.

Help NMC Celebrate its 60th Anniversary: Submit Historical Photos

The 2021 National Mastitis Council (NMC) Annual Meeting marks the organization's 60th anniversary. Program organizers ask that you submit NMC-related photos "from yonder past" to help NMC members take a trip down "Memory Lane."

Please e-mail photos to JoDee Sattler at: jdsattler@nmconline.org. These photos will be used to promote the meeting and NMC. Who knows? Maybe NMC will offer prizes for winning photos or identifying a person, place or thing at an NMC event.



Where was this NMC Regional Meeting held? Look for more historical NMC photos in future issues of Udder Topics and NMC social media channels.



Premier Corporate Member Udder Health Systems Partners with National Mastitis Council in Dairy Industry Advancement

Editor's note: In each issue of Udder Topics, we feature an NMC Corporate Member. This issue of Udder Topics features Udder Health Systems. For more information about becoming an NMC Corporate Member, please contact Kyle Wieskus at: kyle@nmconline.org or 952-758-2146.

Udder Health Systems (UHS) is an Idaho-based, family-owned business that takes a hands-on, boots-on-the-ground approach to the world of milk quality and mastitis prevention. It was founded in 1978 by Allan Britten in Bellingham, Wash., but has since expanded its horizons to multiple facilities and states.

Through in-person visits and testing at its four laboratories in Washington, Idaho and Utah, UHS works hard to implement udder health programs at dairies of all sizes to assist farmers in producing high-quality milk. In addition to its laboratory testing services, UHS provides field support and training to herd managers, milking staff, veterinarians and other veterinary clinics. We also produce more than a dozen types of specialty microbiological culture and molecular confirmation media, and work with more than 100 veterinary laboratories across the country to support their diagnostic services.

Our team consists of veterinarians, animal scientists and laboratory analysts. All of them are committed to solving the milk quality and udder health challenges that each dairy faces.

This also means we place value in the continuing education of our staff and staying current on the changes and knowledge available within the dairy industry. National Mastitis Council (NMC) provides exactly the type of knowledge and educational material that our team needs to excel at their jobs. UHS has been active in NMC for more than 40 years, primarily through Allan Britten's involvement, but now also through his daughter, Justine Britten, UHS laboratory director, and Brian McKay, UHS field operations manager.

"My Dad brought me to NMC my first year after finishing college," said Justine Britten. "I didn't know anyone or really anything. That was 16 years ago. Currently, I am a member of two NMC committees and on the board of directors, and the NMC community feels almost like family. I can't emphasize enough how much I have learned from NMC over the years! As long as I am a part of UHS, we will continue to be an NMC Premier Member."

As the world and dairy industry progresses and changes, so does UHS. We're here to address the milk quality and food testing needs for dairy producers, dairy processors and other food plants. For a complete list of testing services and microbiological culture media products, please visit our website at: www.udderhealth.com.



Milking System Evaluation Incomplete without Considering Cows and Operators

While the three-legged milking stool pretty much rests in history books today, it can still be used to represent the delicate balance of milking systems (the mechanics), cows and operators (people who milk the cows) to achieve optimal milk harvest.

As the final speaker of the National Mastitis Council (NMC) 59th Annual Meeting, Ian Ohnstad, The Dairy Group, Taunton, Somerset, United Kingdom, explained that sophisticated equipment is often used to evaluate milking system vacuum levels and air flows. While this is an important “leg” in evaluating the milking process, not considering the animals or operators may lead to a system being described as satisfactory when that claim may be far from accurate.

Ohnstad noted that the International Dairy Federation Bulletin 396/2005 provides excellent background reading on the milking time assessment. In addition, NMC offers two publications – Procedures for Evaluating Vacuum Levels and Airflow in Milking Systems, and Troubleshooting Cleaning Problems in Milking Systems – that provide valuable information. Go to: www.nmconline.org/publications to order these books.



Ian Ohnstad, The Dairy Group,
Taunton, Somerset, United Kingdom

Evaluating mechanics

Ohnstad discussed mechanical, cow and operator observations. When evaluating the mechanics, he focuses on these key areas:

- Vacuum levels
 - ◇ Use a simple vacuum gauge that is accurate.
 - ◇ For low-level milklines in Europe, the nominal vacuum levels should be 40.0 to 44.0 kPa (12.0 to 13.2” Hg).
 - ◇ For milklines above where a cow stands, nominal vacuum levels should be 44.0 to 48.0 kPa (13.2 to 14.4” Hg).
 - ◇ The nominal vacuum level should be set to achieve an average clawpiece vacuum of 32.0 to 42.0 kPa (9.6 to 12.6” Hg) at peak milk flow.
 - ◇ Cross check the farm gauge with a test vacuum gauge. The farm gauge’s needle should fall to zero when turning off the milking system.
- Vacuum stability
 - ◇ During normal operation, the vacuum level in the receiver vessel should not fluctuate by more than +/- 2.0 kPa (0.6” Hg).
 - ◇ Milkline vacuum should not vary more than 2.0 kPa (0.6” Hg) from the vacuum level at the receiver for more than 95% of a normal milking.
- Vacuum in the liner mouthpiece chamber
 - ◇ The average mouthpiece chamber (MPC) vacuum should be at least 10kPa (3” Hg) less than the average claw vacuum during peak milk flow.
 - ◇ Teat barrel congestion and palpable mouthpiece rings appear to be reduced when MPC vacuum is <20 kPa (6” Hg).
 - ◇ Large-bore liners tend to generate higher MPC vacuum.

Milking System Evaluation Incomplete without Considering Cows and Operators (cont.)

- Vacuum regulation
 - ◇ To test vacuum regulation, listen to the air admission with a conventional regulator or the vacuum pump's speed (if the system has a variable frequency drive).
 - ◇ If units are opened and air admitted, the vacuum level should drop.
 - ◇ When the vacuum level drops about 2.0 kPa, the regulator should stop admitting air.
- Unit fall-off test
 - ◇ With the milking machine operating, all teat cups plugged and pulsation running, opening a single unit should lead to a vacuum drop of <2.0 kPa (0.6" Hg). This demonstrates that the system has sufficient effective vacuum reserve.
 - ◇ Open one unit for every 32 milking points.
- Pulsation
 - ◇ Listen closely to each pulsator for uniformity between pulsators.
 - ◇ Look inside the liner to ensure it is mounted correctly, not twisted and void of obvious cracks or splits.
 - ◇ Insert a thumb into each teat cup to confirm whether the liner is moving through a full range of movement.
 - ◇ Use a pulsation analyzer to analyze pulsation.
 - ◇ If you identify a shortfall, call service support to rectify the problem.
- Liner slippage
 - ◇ Liner slippage should be low (<5%) if a liner is appropriately sized to match average teat dimensions, the nominal vacuum level is appropriate, and milking unit well positioned.
 - ◇ When liner slippage exceeds 5%, determine if this is a herd-wide problem or just a problem for cows with poor udder conformation.

Observing technicians

When Ohnstad observes milking technicians, he evaluates milking unit attachment, milking unit removal, milking technician cleanliness and demeanor, milking routine consistency, milk letdown and teat disinfection. Here's what he evaluates.

- Attach milking units with a minimum of air admission in a smooth, efficient manner.
- Avoid overmilking.
 - ◇ For cows milked twice daily, remove milking units when the flow rate drops to between 0.3 and 0.5 kg/minute (0.66 to 1.1 pounds/minute).
 - ◇ For cows milked thrice daily, raise the end point to 0.6 to 0.9 kg/minute (1.32 to 1.98 pounds/minute).
- Milking technicians should wear gloves and clean, waterproof overalls.
- Wash overalls after each milking.
- Keep gloved hands clean.
- Dairy cows respond positively to a quiet, calm and consistent milking environment.
- Generally, calm cows do not defecate. (If more than 5% of cows defecate during milking, evaluate milking technicians' demeanor.)
- Wipe debris from teats.
- If the milking routine includes pre-milking teat disinfection, apply an approved teat disinfectant to debris-free teats.
- Allow at least 30 seconds of contact time before removing pre-dip.
- Allow 60 to 90 seconds between stimulation and attaching the milking unit.

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Milking System Evaluation Incomplete without Considering Cows and Operators (cont.)

- Attach milking unit to clean, dry teats.
- Disinfect teats (cover all teat ends and most of the barrel) after cluster removal.
- To assess coverage with teat disinfectant, use a light and mirror. Or, wrap a paper towel around each teat and examine the towel.

Monitoring cows

For cow observations, Ohnstad focuses on cow behavior and teat condition. He noted that if cows (and their milking environment) aren't calm and quiet, milking efficiency and milk quality falter.

"Routine teat condition assessment should be a cornerstone of any milking time assessment," said Ohnstad. Use NMC's Teat Condition Portfolio to quickly obtain images of various teat conditions. This tool helps assess environmental, infectious and milking machine-induced teat conditions. Pay close attention to teat-end hyperkeratosis, teat edema and congestion, teat color and the presence of palpable teat-base rings. Table 1 describes common milking machine-induced teat conditions. Score at least 80 cows (or 20 percent of the herd). The subset should include a fair representation of varying parity and lactation stage.

Table 1. Machine-induced teat conditions

	Teat Color	Swelling at the base	Firmness/hardness of the teat end		Open orifice
Observation	Red / blue	Ringling	Hard	Wedge	Diameter
<i>Machine factors</i>					
High milking vacuum	x	x	x		x
Faulty pulsation	x		x	x	
Short D-phase	x		x		
Long D-phase				x	
<i>Liners</i>					
wide bore	x		x		x
aged	x	x			
high tension	x			x	x
<i>Mouthpiece</i>					
large chamber	x	x			
small lip diame-	x	x			
stiff lip		x	x		
Mismatch of liner and	x	x			x
<i>Milking management</i>					
Long dribble times	x	x	x		
Over-milking	x	x	x		x
Teat cup crawling		x			

To read Ohnstad's NMC Annual Meeting proceedings paper, go to the [Member Center](#) on the NMC website. Log in and click on the "Proceedings Library" icon.

Milk Quality Data Provide Udder Health Clues

“Mastitis – it’s not only costly and annoying, it also threatens the dairy industry’s image,” said Sofie Piepers, Ghent University, Merelbeke, East-Flanders, Belgium, at this year’s National Mastitis Council Annual Meeting. “The key to success in mastitis management is not in the solutions but in the problem and its causes.”

To obtain and maintain good udder health, Piepers said it’s important to first analyze the problem. For example, get individual cow somatic cell count (SCC) measurements every four to six weeks and record cases of clinical mastitis. Then, find and provide the most effective, evidence-based solution for each farm-specific mastitis problem – based on facts and data. “Only when the changes are data driven and implemented – through a farm-specific program – will mastitis prevention and control be successful, and result in happy cows, happy farmers, happy advisers, happy consumers and a happy industry.”

Decision making at herd level

Piepers explained that mastitis-related scenarios can be evaluated at the herd and individual cow level. First, let’s look at some herd-level options.

To evaluate a herd’s spontaneous cure rate (number of cows that experienced an SCC decrease [typically $\geq 200,000$ cells/mL at previous milk test to $< 200,000$ cells/mL at current milk test],

multiply by 100 and divide by the number of cows with high SCC [typically $\geq 200,000$ cells/mL] at previous milk test). Piepers said to strive for a spontaneous cure rate > 40 percent, which equates to an average infection duration of 2.5 months.

Cows that do not spontaneously cure are considered “chronically infected.” To get this figure, calculate the number of cows with an SCC $\geq 200,000$ cells/mL at the previous and current milk recording, multiply by 100 and divide by all lactating cows in the herd. Strive for ≤ 10 percent chronic intramammary infections (IMI).

To analyze the percent of new high SCC cows, which is calculated as the number of cows that experienced an SCC increase (typically from $< 200,000$ cells/mL at the previous milk test to $\geq 200,000$ cells/mL at the current milk test), multiply by 100 and divide by all lactating cows in the herd. On average, herds that test monthly and average a bulk tank milk SCC around 200,000 cells/mL have about 8 percent or less of new high SCC cows.

“It is the balance between the percent of new high SCC cows and spontaneously cured high SCC cows that determines a dairy’s bulk tank milk SCC,” said Piepers. Figure 1 shows a farm with a high bulk milk SCC, due to a high percent of new high SCC cows, along with a low spontaneous cure rate. “This pattern is indicative of farms with *Staphylococcus aureus* mastitis problems.”

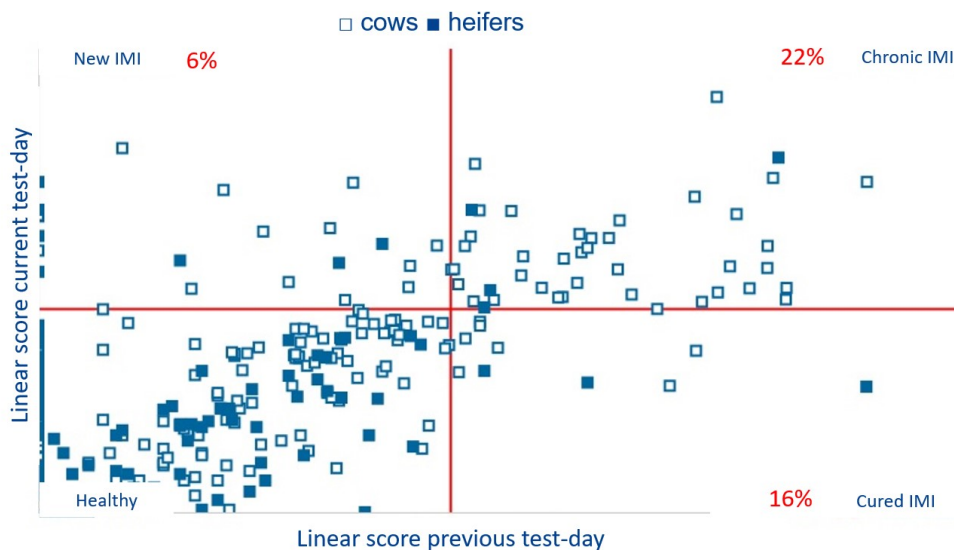


Figure 1. Graph representing a dairy farm with a high bulk tank milk SCC due to a high percent of new high SCC cows in combination with a low spontaneous cure rate.

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Milk Quality Data Provide Udder Health Clues (cont.)

Dry cow management

“Udder health issues related to dry cow management can be easily uncovered by calculating the percent of high fresh cows,” said Piepers. To determine this figure, take the number of adult cows with an SCC $\geq 200,000$ cells/mL at first milk recording after calving (maximum 42 days in milk) from five days in milk and divide by all animals that had their first SCC record at that milk recording. “More than 15 percent high fresh cows indicates that too many cows either contracted a new IMI or did not cure from an existing IMI during the dry period.”

Analyzing the last milk recordings of the previous lactation helps identify if a cow has a new IMI or one that never cleared from the previous lactation. A new IMI developed during the dry period if the last SCC test (before dry-off) was $< 200,000$ cells/mL and the first test was $\geq 200,000$ cells/mL after freshening.

Piepers noted that cows with a high SCC at dry-off, but did not have a high SCC more than three times in the last three milk recordings before dry-off, are expected to easily cure during the dry period, assuming they were dried off with a long-acting antibiotic. “If not, the resistance against the antimicrobial that was used or presence of a highly virulent mastitis pathogen that is difficult to successfully treat (e.g. *Staph. aureus*, *Klebsiella* spp., etc.) can be suspected,” said Piepers.

To get a definitive answer, use bacteriological culturing and antimicrobial sensitivity testing. “Chronically infected animals (high SCC more than three times before dry-off) have a low cure probability, independent of the pathogen that is involved and the dry cow therapy that was applied,” said Piepers.

Heifer mastitis management

It’s not unusual for a heifer to freshen with an IMI. In several heifer mastitis surveys conducted throughout the world, up to 60 percent of quarters harbored an IMI at calving. Most of these IMI appear as subclinical mastitis characterized by an elevated SCC without any visible inflammation.

If heifer mastitis (SCC $\geq 150,000$ cells/mL from one to 10 days post freshening) exceeds 15 percent, a herd is considered to have a heifer mastitis problem. “If average heifer SCC exceeds 150,000 cells/mL during the first 100 days in milk, this is strongly indicative of persistent infections caused by major pathogens, such as *Staph. aureus*,” said Piepers.



Sofie Piepers, Ghent University, Merelbeke, East-Flanders, Belgium

Decision making at cow level

For individual cow mastitis testing, bacteriological milk culturing is still the best way to identify the bacterial cause of udder health challenges. “Early detection of cows with an IMI and bacteriological culturing and implementation of specific measures based on the outcome is still a cornerstone in controlling mastitis,” said Piepers. “Obtaining and maintaining good udder health depends on two basic principles: shortening the duration of existing infections and limiting the number of new infections.”

Piepers explained that making the optimal decision (wait or test) for cows with an existing infection is not easy. On one hand, the spontaneous cure rate for a recently acquired subclinical IMI is estimated at 41 percent. On the other hand, cows with a high composite SCC have a two to four times higher hazard (for mastitis) than cows with a low composite SCC.

With the latter in mind, the first decision in a mastitis monitoring program should be whether or not a particular cow still has a chance to spontaneously cure (i.e. without antimicrobial treatment). “Animals that still have a high chance to spontaneously cure should not immediately be tested,” said Piepers. “Cases that are unlikely to spontaneously cure but can benefit from antimicrobial treatment should be tested.”

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Milk Quality Data Provide Udder Health Clues (cont.)

The chance to spontaneously cure depends on parity, SCC, history of elevated SCCs, days in milk and mastitis-causing pathogen. In general, an IMI caused by a major pathogen (e.g., *Staph. aureus*) is more difficult to spontaneously cure than an IMI caused by a minor pathogen (e.g., non-*aureus* staphylococci).

Consider these cow-level parameters when estimating the probability of spontaneous cure of cows with subclinical mastitis:

- **Lactation number:** Older cows are more difficult to cure than younger cows.
- **Chronicity:** Cows with a chronic infection (≥ 3 times high SCC on test day) have a lower probability of cure than cows with a recent infection.
- **SCC:** The chance of spontaneous cure decreases with increasing SCC.

- **Number of infected quarters:** Animals with two or more infected quarters are more difficult to cure than animals with one infected quarter.
- **Quarter position:** A hind quarter is more difficult to cure than a front quarter.
- **Number of colonies:** An increasing number of bacteria in the mammary gland results in a lower chance of cure.

This article is based on the 2020 NMC Annual Meeting proceedings paper “What Can the Data Tell Us?” To read the complete paper, log in to the Member Center on the NMC website (www.nmconline.org) and click on “Proceedings Library.”

NMC September Webinar



2020 National Mastitis Council Webinar



“Milking Procedures for Optimal Milk Quality & Milk Harvest;
Procedimientos de ordeño para una óptima recolección y calidad de leche”

Presented in Spanish

Jorge Delgado
Training and Talent Development for Dairy Workers
Alltech T²R Program

**September 10
2 p.m. Central time**



A Global Organization for Mastitis Control and Milk Quality

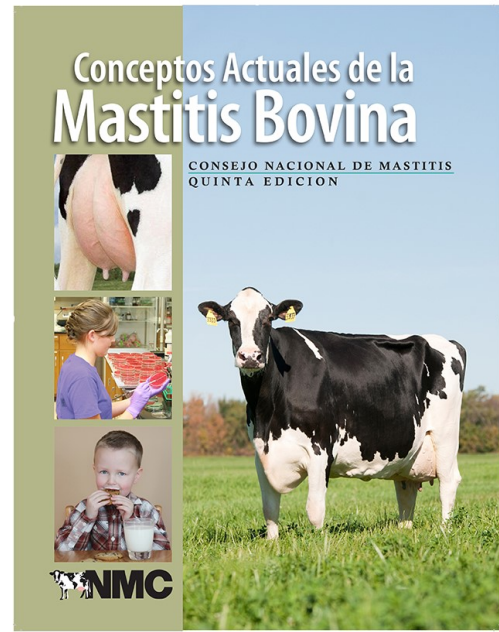
Current Concepts of Bovine Mastitis in Spanish

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2021 NMC Annual Meeting

Save the Date

NMC Annual Meeting

January 25-28, 2021

Dallas/Addison Marriott Quorum by the Galleria
Dallas, Texas