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WE CAN STEP UP OUR LAMENESS DETECTION UTILIZING 3-D

by Alvaro Garcia

LAMENESS is a major issue in the dairy industry, significantly affecting the health, well-being, and productivity of cows. It often originates from management practices during the early lactation or rearing phases. Studies consistently link primary lameness-related diseases to factors experienced early in life, such as sole bruising, sole ulcers, white line lesions, and digital dermatitis. Digital dermatitis, caused by tenacious Treponemes bacteria, can persist in heifers even after clinical recovery.

To effectively manage lameness in dairy heifers, it's essential to focus on reducing early-life exposure to these causative agents. This can be done through strict biocontainment, meticulous foot hygiene, and regular foot disinfection.

A shift in our understanding of lameness causes, especially claw horn lesions, has moved toward a biomechanical perspective. This emphasizes the importance of preventive measures and early intervention strategies, including the prudent use of anti-inflammatory medications.

An eye on lameness

Early lameness detection is a promising frontier in managing lameness in dairy cows, and 3-D cameras are a standout technology. These cameras continuously monitor cow movements and behaviors, identifying subtle changes that signal lameness before clinical symptoms appear. This early detection allows for swift intervention and treatment, reducing the severity and duration of lameness, which is especially crucial for dairy heifers.

Additionally, 3-D cameras provide objective, quantitative data on gait and posture, improving our ability to manage lameness issues in the herd. Timely intervention assumes a pivotal role in optimizing the prospects of successful lameness recovery in dairy cattle. The following points underscore the criticality of early intervention.

Halting disease progression: Early treatment functions as a fundamental safeguard against the advancement of lameness conditions, including claw lesions such as white line disease, sole hemorrhages, and sole ulcers. By intervening during the initial stages of lameness, detrimental effects on the cow's health and well-being can be kept to a minimum.

Alleviating pain and discomfort: Timely intervention plays a key role in alleviating the pain and discomfort associated with lameness. Incorporating nonsteroidal anti-inflammatory drugs as a standard treatment component has proven effective in pain reduction. One example is flunixin meglumine (Banamine), commonly employed for pain relief and anti-inflammatory purposes.

Enhancing treatment effectiveness: Early detection and prompt treatment have a profound impact on treatment outcomes. For instance, a comprehensive approach that combines anti-inflammatory drugs, trimming, and other measures has demonstrated the highest rate of successful recovery within a five-week period. Adherence to recommended treatment protocols substantially augments the likelihood of positive treatment outcomes.

STRATEGIES FOR EARLY DETECTION and treatment help minimize the negative impact lameness can have on a dairy herd.

Mitigating economic losses: Each lameness case incurs expenses related to treatment, medication administration, diminished fertility, or even culling. By addressing lameness issues during their nascent stages, farmers can amplify operational efficiencies and curtail expenses.

Value in early intervention

Traditionally, dairy producers have raised all heifers to ensure a future supply of replacements. However, advancements in management and the use of sex-sorted semen have led to a surplus of dairy replacement heifers in the U.S. The value of prepartum heifers is estimated at around $1,300, with rearing costs ranging from $1,700 to $2,400.

Dairies that produce an excess of heifers for sale may face significant economic challenges due to factors like mortality, disease, fertility, and elective culling. Balancing the economic aspects of dairy heifer management with the dairy industry's broader goals is a complex challenge that requires strategic planning and thoughtful consideration.

Addressing lameness in the dairy industry is paramount, given its profound implications for the health, welfare, and productivity of dairy cows. Our understanding of the origins of lameness, often rooted in management practices during early life stages, underscores the importance of preventive measures and early interventions.

The transformation in our perspective on lameness, shifting from traditional models to a biomechanical framework, highlights the critical role of fostering the development and preservation of the digital cushion. Concurrently, early intervention strategies, including the judicious use of anti-inflammatory medications and prompt treatment, are recognized as integral components of a comprehensive approach.

Advanced technologies like 3-D cameras hold great promise in mitigating lameness. They enable early detection, allowing for swift intervention and reducing the impact of lameness, which is particularly important for dairy heifers.

Emphasizing the speed of lameness detection is crucial for effective resolution. Timely intervention not only minimizes complications but also speeds up the recovery process, providing multiple benefits from halting disease progression and alleviating pain to enhancing treatment effectiveness and reducing economic losses.

It's essential for farmers, veterinarians, and hoof trimmers to stay informed about recommended treatment protocols and the advantages of early intervention. This collective knowledge empowers effective lameness management, benefiting animal well-being and dairy farm sustainability. Prioritizing proactive measures and innovative technologies can lead to a future where lameness has a minimal impact on dairy cattle, promoting their health and productivity. 1000+

■ The author is a retired professor of dairy science from South Dakota State University. He is now a consultant with Dellait Dairy Nutrition & Management.

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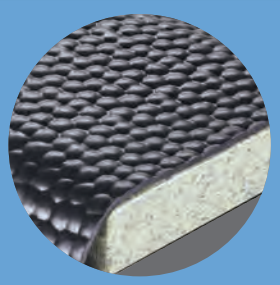
by Agri-Comfort



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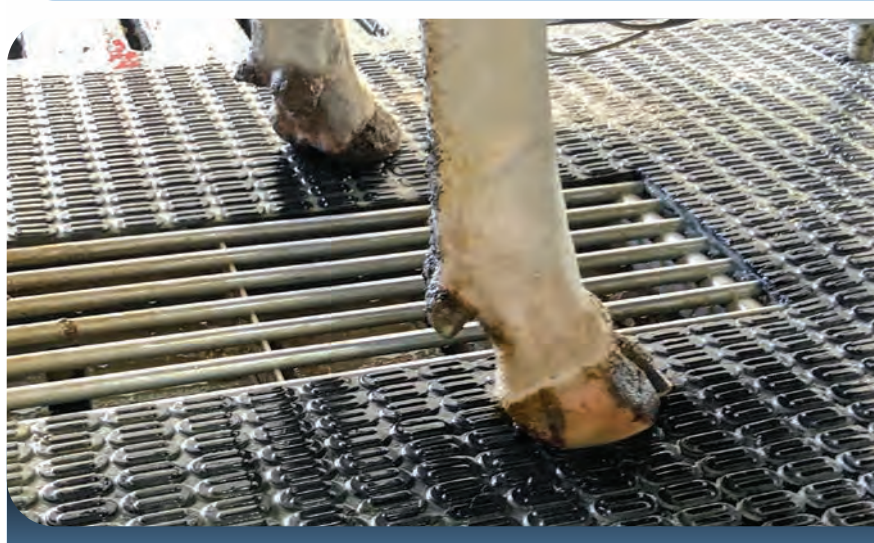

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THE GLUE THAT HOLDS TOGETHER DAIRY'S SUSTAINABILITY RESPONSE

With criticism about agriculture's impact on the environment mounting, the national dairy checkoff program took steps to expand and document the industry's sustainability efforts.

by Michele Ackerman

SURELY, our grandparents could not have envisioned a day when cow burps are regarded as culprits in global warming and nut-based beverages are viewed as sustainable alternatives to milk. Like it or not, this is the social landscape in which farmers now operate their businesses.

To protect our social license to operation, Steve Maddox, a former National Dairy Board member, paraphrased a statement made by Benjamin Franklin at the signing of the Declaration of Independence: "We need to come together or hang separately."

To ensure dairy farming is a viable option for future generations, we need to adopt a campaign that is national in scope, flexible, profitable for producers, and based on science, summed the California dairy farmer who has been involved with dairy's response from the beginning.

Maddox and Stephanie Masiello Schuette, vice president of environmental research affairs for Dairy Management Inc. (DMI), discussed why the sustainability movement became a priority for dairy farmers and how the national dairy checkoff is helping them document and improve sustainability in an episode of the "Your Dairy Checkoff" podcast.

For farmers, the world's ultimate recyclers, the silver linings in this cloud are discoveries that lead to new ways to care for the land and cattle and innovative options to monetize farming practices. As an industry, dairy has committed to being a part of the environmental impact solution and producing the same safe nutriment it has provided for centuries.

The drive to document

While the push to minimize human activity on the environment has been building for decades, it did not hit home for the dairy industry until about 15 years ago. The issue was not sustainability itself, but rather, the fact that activists were exaggerating the impact of animal agriculture and generating pushback from milk buyers, concluded Maddox. At that point, international perception held that livestock was causing anywhere from 10% to 40% of global anthropogenic greenhouse gas (GHG) emissions.

The dairy community knew its numbers were different from those being published in mainstream media but didn't have new, confirming science to back it up, noted Maddox. Dairy was fighting claims made in closed rooms, stated a few times, and then declared as facts.

Dairy producers needed to do something to protect their market and their social license to operate. So, in 2007, the DMI board launched the Innovation Center for U.S. Dairy to work on behalf of the dairy community and ensure a healthy and sustainable future. The Innovation Center and industry leaders developed a sustainability initiative that included three steps:

1. Convening a Sustainability Council to provide strategic direction and navigate challenges and opportunities.
2. Adopting a science-based approach to measure and improve the dairy industry's environmental footprint.
3. Establishing the first voluntary goal to reduce GHG emissions.

This was the dairy industry's initial thrust to bring true science — not political opinion — to the sustainability argument, Maddox remarked. Scientific, peer-reviewed evidence, which has been the backbone of

industry promotion through the national checkoff for decades, was again the basis of the sustainability cause.

In 2008, dairy industry stakeholders gathered in Bentonville, Ark., for the inaugural Dairy Sustainability Summit. Together, they developed a sustainability roadmap with action plans for every step of the dairy value chain.

The following year, the Innovation Center and USDA signed a memorandum of understanding to provide access to research and financial resources. Among the goals were to accelerate the adoption of innovative manure management and energy-saving technologies through USDA programs and develop computer-based tools to help producers assess measures, find resources, and implement practices for sustainable improvements.

An initial priority funded by the Innovation Center, a GHG life cycle assessment for fluid milk, was completed in 2010. The findings helped dispel the false claims about dairy's environmental impact. Based on data from 2007 and 2008, the carbon footprint of a gallon of milk from farm to table was 17.6 pounds of carbon dioxide equivalents or approximately 2% of the country's total GHG emissions.

Added to this scientific documentation was a pair of studies conducted by Jude Capper and Roger Cady. The first study completed in 2008 documented a 41% reduction in the dairy industry's carbon footprint from 1944 to 2007 thanks to advanced farming methods. A follow-up study in 2020 showed an additional 19% drop in carbon footprint in the years since, with the production of a gallon of milk in 2017 requiring 17% less feed, 21% less land, and 31% less water than it did a decade earlier.

The scientific approach must be working because anti-animal agriculture groups are now attacking researchers and their funding, Maddox observed.

History is a great teacher

Sustainability is not the first customer-driven movement to impact dairy industry practices, and it won't be the last. However, adverse experiences can teach us how to better respond in the future, so history need not repeat itself.

Dairy producers' experience with the new biotechnology push in the late 1980s and early 1990s, including recombinant bovine somatotropin (rBST), taught us two valuable lessons, remarked Maddox.

First, dairy producers need to have one voice and one approach when communicating with consumers and customers. Beyond the actual science of rBST, it was the diversity in opinions about its use that left the door wide open for an attack from anti-agriculture extremists. This allowed them to condemn some of the positive benefits of a biotechnology that could have enhanced the dairy sustainability drive.

Second, the push for biotechnology also taught dairy producers to be wary of unfunded mandates. In the past, some milk buyers expected producers to adopt protocol without compensation, Maddox told listeners. Solutions need to be profitable for the dairy farmer, not just done for the sake of improving sustainability. When technology and new practices are shown to positively impact the bottom line, they are more quickly adopted.

And because dairies in this country range from small organic operations to large conventional enterprises, sustainability practices need to be customized to the farm. The widespread adoption that is necessary to advance sustainability as an industry hinges on a menu approach for technology and follow-up, one that allows producers to decide what best suits their operation.

The value of science

Science allows the dairy industry to be transparent across the entire value chain, said Masiello Schuette. By working with researchers and going through the peer review process, the dairy community is sharing what is being done, how it is being done, and being quite open with the results.

In the short term, data from research allows dairy to document progress, like the carbon footprint reductions that have occurred over the past seven decades. In the long term, it enables dairy to make decisions about future technologies and ensure adequate funding, so producers can take advantage of the opportunities that arise in this space.

The checkoff program can be a link between dairy producers and researchers. It enables dialogue so researchers can understand what producers are facing and what they need. This ensures research will be safe, efficacious, and feasible for farmers, according to Masiello Schuette.

One such collaboration was a tool to help producers evaluate feed additives as options to reduce enteric methane emissions. Industry experts, academia, and farmers were brought together and asked what should be considered in a discussion about feed additives, Masi-

ello Schuette explained.

From these discussions, a decision support tool was developed to help producers or anyone else in the dairy value chain ask the right questions and determine a level of confidence in the safety, efficacy, and trade-offs of feed additives, and if they ultimately meet requirements for usage.

DMI's goal is to provide producers with science-based options but not tell them what to do, said Masiello Schuette. This guide should be useful for assessing future technology as more of these products come on the market.

The Greener Cattle Initiative

Another collaboration to leverage research dollars is the Greener Cattle Initiative (GCI), a giant global partnership that came into being through DMI and partners at the Foundation for Food and Agriculture Research (FFAR), noted Masiello Schuette.

GCI funds research that focuses specifically on the reduction of enteric methane emissions, the single largest source of direct GHG emissions in the dairy and beef sectors. They occur on the farm through manure degradation and enteric fermentation (the digestive process of cattle). Research focuses on ways to make improvements through feed additives; selective breeding; technologies like sensors, robots, and artificial intelligence; and a better understanding of the rumen microbiome.

The consortium was founded by the Innovation Center, FFAR, and seven other industry partners: ADM, the Council on Dairy Cattle Breeding, Elanco, Genus PLC, the National Dairy Herd Information Association, Nestlé, and the New Zealand Agricultural Greenhouse Gas Research Centre. The Global Methane Hub and JBS USA have joined as steering committee members.

GCI was established because there is a lot of interest in reducing enteric methane emissions but little current funding, remarked Masiello Schuette. GCI originally planned to award close to $5 million in grants. But interest from partners has been so strong that this amount will be nearly doubled.

More than 110 letters of intent were received from researchers across the globe. Since the webinar aired, three grants have been awarded totaling nearly $7.3 million. Roderick Mackie and his team at the University of Illinois Urbana-Champaign will study how diets and additives affect hydrogen production and utilization in the rumen and how changes in hydrogen dynamics affect enteric methane emissions. Francisco Peñagaricano of the University of Wisconsin-Madison will evaluate the cattle genome for methane traits so tools can be developed to reduce emissions through selective breeding. Alexander Hristov and his colleagues at Penn State will develop novel enteric methane inhibitors to reduce enteric methane emissions and study methods that will deliver them to cattle efficiently.

DMI is excited that significant sources of funding for research will lead to tangible outcomes for producers, said Masiello Schuette.

Progress has been made

The dairy industry's original challenge was to establish a measure, a baseline, that gave producers credit for what they were already doing, noted Maddox. Today, we have accurate measurements of carbon sequestration and farmers can now monetize their practices and claim carbon credits as another way of paying the bills on the farm.

The sustainability work the dairy industry has done over the past 15 years has also paved the way for others to join the cause. Companies like Nestlé, McDonald's, and Starbucks are now funding their own research projects on the farm and contributing to the database of science. Without a solid base of progress in place, they would not have been willing to invest.

Some of these companies, like Dominos, are also promoting the work of dairy farmers through their own marketing efforts. A third-party endorsement of dairy farmers on a pizza box goes a long way in helping the dairy community combat the efforts of those who are trying to rewrite animal agriculture, noted Maddox.

The resolve to be part of the sustainability solution and tell the true dairy story is not a quick effort, remarked Maddox. Dairy producers are in it for the long haul and finding new ways to monetize what they are doing, whether that is sequestrating carbon, saving water, improving air quality, or securing a chair at the table where discussions are held about the global food supply chain. 1000+

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KNOW YOUR EMPLOYER ROLE

A handbook specific to your farm can protect you and your employees.

by Kathryn E. Childs

FARM employment has changed a lot over the years. In the past, farmers may have worked alongside their family and one or two farmhands. Now, dairies might have dozens of employees. This shift toward more employees means more employee management and a growing need for legally conscious employment relationships.

On a Professional Dairy Producers "Dairy Signal" webinar, Troy Schneider, partner and attorney at Menn Law Firm (formerly Twohig, Rietbrock, Schneider & Halbach Law Office) in Chilton, Wis., shared his expertise on the hiring and firing process.

Terms of employment

Businesses in Wisconsin — as in most states — primarily adhere to an "at-will" employment model, meaning both employees and employers may fulfill or offer a position and leave or end a position without notice or cause. This allows for flexibility within the hiring process but potential inconvenience in the firing process.

If an employer is not aware of what constitutes a termination under the "at-will" statute, they could inadvertently commit an unlawful dismissal. Too, if an employee is not aware of their rights under performing their job "at will," they might not know if and when those rights are being violated. Schneider suggested composing a comprehensive employee handbook that clearly outlines expectations in order to avoid misunderstandings.

"Include an equal opportunity statement and an at-will statement on the application and in the handbook," he said, "and reserve the right to make policy modifications."

This will not only put to rest any doubt as to the status of the employment relationship, but it will also provide reference should anything untoward occur.

Types of dismissal

There are two kinds of termination: voluntary and involuntary. Voluntary includes quitting by word or action — an employee saying "I quit" or failing to show up to work for an individually determined number of shifts. Involuntary termination includes being fired or undergoing a constructive discharge, which is when an employee quits because their working conditions force them to do so.

An employee maintains more benefits when they are involuntarily dismissed rather than if they leave voluntarily; an employer is required to pay them their unused paid time off (PTO) and sick pay. Either way, though, the employer must provide a final paycheck.

"Make sure everything is documented thoroughly," Schneider said. "Both when it happens — if misconduct occurs — and throughout the termination process."

Taboos to avoid

Under "at-will" employment, dismissal is permitted without warning or reason, but even still, there are instances in which firing an employee is not legal.

Examples of illegal termination include discrimination (based on religion, sex, race, disability, gender identification, national origin, age, or citizenship), retaliation (in response to an employee's harassment or safety violation report, for instance), whistleblowing (based on an employee reporting a hazardous workspace), law violations (due to an employee's refusal to comply in breaking the law), and employment contract violations (in opposition to what is listed as cause for termination in the handbook).

The risk of violating employee contracts is why Schneider emphasized making sure that, as an employer, your handbook does not "give rights" you did not intend to give, such as outlining specific situations that constitute involuntary termination, which would make any termination not included on that list unjustified and illegal.

Employees should be equally conscientious about what's in their handbook and under what terms they've been hired. If employer conduct is unlawful, they may be able to report and/or contest the behavior.

Keys to remember

Schneider ended by sharing what he considered to be the key takeaways from his lecture.

"Have good policies in place, have good personnel, keep contemporaneous records, and watch what you say and how you say it," he said.

Schnieder added, "Understanding legal rights and responsibilities in the hiring and firing process is important for everyone involved."

Schneider also referenced the book *Hiring and Firing in Wisconsin* published by the State Bar of Wisconsin as a source to turn to for more information.

Having a lawyer review your employee handbook as an employer can be helpful, too. That way, no one is in the dark about what is expected during all phases of an employment relationship. 1000+

■ The author is a freelance writer based in Rockford, Ill.

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