

# Spartan Dairy

## Newsletter

Summer 2022 Vol.2 No.2



### **MSU North American Intercollegiate Dairy Challenge team wins fourth consecutive national title**

*L to R Derek Vander Hoff, Jessie Nash, Katie Wilson, and Mikayla Bowen*

Introducing two new dairy educators

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National Mastitis Council & 4-H activities in July

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Promises and potential of automated milking systems

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- Don Martell, Gary Trimmer, & William (Bill) Oswalt

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Dairy at MSU



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Dairy at MSU

# MSU Dairy Challenge

## Fourth national title in a row

A team of four Michigan State University (MSU) students earned first place in their division in the 20th annual North American Intercollegiate Dairy Challenge Contest (NAIDC) held March 31-April 2, 2022 in Green Bay, Wis. This is the fourth contest in a row that MSU has won their division. Twenty-four teams from 22 universities across the United States and Canada competed in four divisions.

Members of the winning team were: Jessie Nash, a senior studying Agricultural, Food, and Resource Economics from Elsie, Mich.; Mikayla Bowen, a junior in the Animal Science Dairy Concentration from Addison, Mich.; Katie Wilson, a junior in the Animal Science Dairy Concentration from Blanchard, Mich.; and Derek Vanderhoff, a senior studying Agricultural, Food, and Resource Economics from Hillsdale, Mich. Bowen, Nash, and Wilson started their academic careers at MSU in the Institute of Agricultural Technology (IAT) dairy program. The team was coached by Dr. Roger Thomson, an Academic Specialist in the Department of Animal Science.

**Dairy Challenge, which was started at MSU in 2001, is a competition where students work in teams to evaluate dairy operations. Over two days, students are given herd data, financial records, visit the dairy, and interview the dairy producer and staff. Students then prepare a comprehensive presentation of their findings and include solutions for areas of improvement on farm. Solutions and recommendations must be practical and financially sound. Presentations are evaluated by a panel of dairy industry experts and consultants.**

In addition to the national contest, the NAIDC concurrently hosts the Dairy Challenge Academy. The goal of the academy is to provide an extended learning environment for college sophomore, juniors, and seniors in 4-year dairy science programs, community colleges, and technical schools. These students work in mixed teams across universities and are guided by mentors as they evaluate dairy operations and build a presentation. MSU Dairy Academy participants included Drew Neyer, a sophomore in the Animal Science Dairy Concentration from Shepherd, Mich.; Samantha Whitehead, a sophomore in the Animal Science Dairy Concentration from Corunna, Mich.; Rachael Bosse, a sophomore in the Animal Science Dairy Concentration from Dorr, Mich.; Emily Ockerman, a junior in the Animal Science Dairy Concentration from Davison, Mich.; Brooke Voelker, a junior in the Animal Science Dairy Concentration from Paris, Mich.; and Chase Rievert, a Junior in Animal Science from Sebewaing, Mich. Academy students were guided by Dr. Joe Domecq, an Academic Specialist and the Coordinator of Dairy Education Programs in the Department of Animal Science.



Reflecting on a successful 2022 program, Dr. Thomson remarked, “Exiting from almost 2 years of virtual instruction, it has been great to return to face-to-face learning and participating in experiential activities like Dairy Challenge. The 2022 MSU National Dairy Challenge team had some catching up to do regarding their dairy farm walk-through skills. They also carried the burden of wanting to continue the string of first place ratings. The members of the 2022 team worked extremely hard starting in the fall of 2021 and continued into the spring semester with weekend practices on top of their regular classroom work. Their success is the result of the teamwork and effort they put toward their goal of winning a first-place rating. I am so proud of their efforts and happy for the results they earned.”

[View full article here](#)



# Dairy Spotlight

## Cora Okkema and Victor Malacco



**Cora Okkema:**  
**Dairy Extension Educator**

**5, 11, 1999.** These three numbers were the beginning of my dairy story in Michigan. It was in 1999 that my parents made the decision to move our family of five from The Netherlands to Michigan to pursue their dream of building a successful dairy farming business. The farm started with eleven cows, all transported by boat across the Atlantic Ocean. Spoiler alert: we're still farming and boy, has the farm grown!

I grew up working on the family farm, learning many lessons along the way. A big one being that change, even though scary, is good, and that growing pains are a natural part of this process. Especially when it means progress and improved practices. This lesson has stayed with me throughout life as I pursued my own passions. Being a dairy kid, my senior capstone project in high school had to be related to farming. So, I learned how to breed cows. Seeing the offspring from that project in the milking herd today reminds me that our journey all starts somewhere. Once graduating, I moved to Northwestern Iowa for my bachelor's degree in animal science. I had incredible opportunities to see how other farmers manage their herds and meet farmers from across the globe, specifically in The Netherlands and in Romania. These experiences showed me the value of having a management team that respects one another and surrounds themselves with peers who are not afraid to discuss new ideas and provide valuable insight for where the dairy industry is headed.

Management was changing at the family farm and there was an opening for a herdsman. This was a massive shift from feeding calves, cleaning barns, and handing my dad tools. I am so glad I took that leap of faith. A passion for production dairy farming was ignited that I never knew I had. In two and a half years as herdsman, I leaned on the veterinarian, the nutritionist, the breeder, and countless others for guidance. Not only did I gain confidence in my abilities but learned that this management team is something I want to continue to foster. Their influence on my life led me to begin a Master's degree in livestock behavior and welfare at Colorado State University in 2019. My research focused on the prevalence of udder edema in dairy cattle and the impact the disorder has on parlor behavior in first and second lactation cows. As I was finishing up my degree, I was offered the position of Dairy Educator with Michigan State University Extension for Northwest and Central Michigan. I am honored and excited to be back home to serve my fellow Michigan dairy farmers to help them achieve their goals and problem-solve for maximum impact.



**Victor Malacco**  
**Dairy Extension Educator**

I was born into a family of dairy farmers and veterinarians. Growing up on my family's farm, I had firsthand experience assisting with livestock farming which undeniably influenced me to attend the Federal University of Minas Gerais— Brazil, to pursue a bachelor's degree in veterinary medicine. As a veterinarian student in Brazil, I directly benefited from leading an extension program with the objective to improve milk quality and reduce mastitis in dairy herds in the state of Minas Gerais— Brazil's largest milk-producing state. Working on this project sparked my interest in practical research questions raised by the farmers and community members, which led me to pursue a master's and Ph.D. in animal science.

In my research career, my goals have always been better understanding protein metabolism in dairy cows and how to improve the efficiency of nitrogen use on farms, aiming for both economic and sustainability benefits for the dairy industry. In 2018, I moved to the U.S. to do part of my Ph.D. at Purdue University under the guidance of Shawn Donkin. During my three years at Purdue University, as a Ph.D. student and later as a postdoctoral scholar, I developed several experiments to evaluate the productive and physiological responses of cows supplemented with rumen-protected amino acids.

I joined the MSU Extension Dairy Team in December of 2021. One of my current goals is to get to know farmers, stakeholders, and community members. I am excited to learn more about the progressive dairy industry in Michigan and how I can help producers thrive in their businesses. I hope to be a resource on nutrition and feeding management, milk quality, dairy herd health, and work with dairy farmers to improve their dairies' overall efficiency, profitability, and environmental sustainability.

Working as a dairy educator with Michigan State University Extension is an opportunity for me to give back to the dairy farm community by providing high-quality information, advising in the decision-making process, while empowering and supporting farmers to identify and pursue their goals.



# News & Updates

All things dairy at MSU

## New USDA grant supports MSU researcher studying prevention of dairy cow diseases after calving

Angel Abuelo, an assistant professor in the Michigan State University College of Veterinary Medicine (CVM), has received a \$642,000 grant to develop diagnostic tools that predict major illnesses during dairy cows' transition from late gestation to early lactation. The grant is funded by the Agriculture and Food Research Initiative of the U.S. Department of Agriculture's National Institute of Food and Agriculture.

Roughly 75% of diseases in adult dairy cows occur in the first month after calving, with two of the most devastating being mastitis — a bacterial infection of the udder — and metritis, a bacterial infection of the uterus.

By Cameron Rudolph

[View full article here](#)



## Tri-State Dairy Nutrition Conference



At the Tri-State Dairy Nutrition Conference, held April 11th- 13th, MSU had 9 students compete in the student showcase and competition.

- Kirby Krogstad placed 1st in the PhD level competition, with Ursula Abou-Rjeileh placing 2nd.
- Alex Benoit placed 1st in the MS research category and Katelyn Goldsmith placed 2nd.
- In the undergraduate category Cora Schau placed 3rd.

Congratulations to all of the students who competed and represented MSU so well!

For more information visit: <https://www.tristatedairy.org>

## MSU students receive scholarship awards for 2021-22

The Michigan Dairy Memorial and Scholarship Foundation and endowments honoring Howard Cowles and Rolland Patenge have awarded over \$80,000 in scholarships to Michigan State University (MSU) students pursuing dairy industry-related programs of study for the 2021-22 academic year.

The following students pictured were awarded a named Michigan Dairy Memorial scholarship: Jared Sanderson, Madison Wieland, Adalee Thelen, Brooke Voelker, Kristen Burkhardt, Kelsey Pasch, Monika Dziuba, Morgan Mathews and Chase Rievert.

[View full article here](#)



## CANR honors 2022 cohort of Global Scholars in Extension



The Michigan State University (MSU) College of Agriculture and Natural Resources (CANR) has announced a new cohort of 17 CANR Global Scholars, five representing outreach and MSU Extension.

Through this endeavor, CANR leadership annually selects three or more global scholars to strengthen and expand their global linkages, networks and collaborative programs across three core missions of the college in diverse areas of research, education and outreach.

By Abbey Miller

[View full article here](#)



# News & Updates

All things dairy at MSU

A Year in Review...

## Spring Student Events at MSU

### MSU animal science students compete in first national dairy cattle judging contest of 2022

Seven MSU students from the College of Agriculture and Natural Resources recently traveled to Richmond, Utah to compete in the first national dairy cattle judging contest of 2022. The Western Spring National Holstein Show was held May 19-20 at the George B. Caine Pavilion, with the two MSU teams each bringing home several trophies.

Representing MSU as the White Team was Mikayla Bowen, Jessie Nash, Kelsey Pasch, and Katie Wilson. The team earned third overall in in the contest and third in oral reasons. Also attending the event was the Green Team, which consisted of Rachael Bosse, Drew Neyer, and Adalee Thelen. The Green Team earned third place in placings. Individually, the team members also earned many distinctions. Nash was sixth overall and fifth in oral reasons; Neyer was third overall and third in oral reasons; Pasch was fourth overall; and Thelen placed eighth overall.



### Students reflect on the past year

#### Kristen Gallagher

“My best memory was finishing biopsy sampling on our early lactation trial.”



#### Alex Benoit

“My favorite part of the year was spending time at the dairy farm with lab-mates working on different research trials.”

#### Ursula Abou-Rjeileh

“My favorite part of the year was having conferences back in person.”



#### Kirby Krogstad

“Two of my research articles were published in peer-reviewed journals.”

### Dairy Club students visit Ohio State's Dairy Club

This past April, members of the MSU Dairy Club traveled to Ohio to network with Ohio State's Dairy Club. They travelled to Select Sires Inc. headquarters and learned about the history of the company, the lab portion of the business, and future career opportunities. Additionally, the club partnered with the Ohio State University Dairy Club to learn about their dairy farm on campus, the dairy education programs, and to connect with other dairy focused students. Finally, they toured MVP Dairy.





# News & Updates

All things dairy at MSU

## MSU Dairy Cattle Teaching and Research Center: Supporting Michigan's Dynamic Dairy Industry



**The MSU Dairy Farm  
helps support Michigan's  
\$15.7 Billion dairy industry**

**Use this QR code to learn more about  
the exciting future of the MSU Dairy:**



### Michigan Dairy Health Symposium 2022 Highlights

After being postponed due to the pandemic, we were able to welcome dairy industry stakeholders back to the MSU campus for the 3rd edition of the Michigan Dairy Health Symposium (MDHS) on March 10, 2022. This one-day event focused on dairy calf health and was attended by 107 participants that included veterinarians, veterinary nurses, herd consultants, and dairy producers. Although the target audience was Michigan dairy industry representatives, the event also drew attendees from other states (OH, IN, MN, CA) and Canada.

Nine experts from MSU and other universities presented the most recent developments in areas such as intra-uterine impacts on calf health, colostrum management, preweaned nutrition and housing, and disease diagnosis and treatment. The sessions were designed as short presentations to allow for greater discussions among presenters and participants. Four early-career scientists and 10 graduate students from MSU also showcased their dairy-related research in lighting talk and poster sessions, respectively, allowing for further discussion with attendees.

Participants' feedback demonstrated that the information shared was very useful and practical for their daily work. The presentations and abstracts can still be accessed at <https://cvm.msu.edu/mdhs>. The MSU Dairy Extension Team would like to thank the sponsors of the event as well as Angel Abuelo, Faith Cullens-Nobis, and Nicole Walker for the organization. We are already working on the 4th MDHS – Stay tuned!

# SAVE THE DATE! NMC

## National Mastitis Council Regional Meeting

**When:** July 12-14

**Where:** Graduate East Lansing  
East Lansing, Michigan

\* Registration, schedule and further details can be found at <https://www.nmconline.org/regional-meeting/>



## Michigan Dairy Expo and Michigan 4-H Youth Dairy Days

July 18, 2022 - July 22, 2022

Michigan State University Pavilion for Agriculture and Livestock Education

Join 4-H members from around Michigan July 18-22, 2022 at the Michigan State University Pavilion for Agriculture and Livestock Education for Michigan 4-H Youth Dairy Days! Dairy Days is part of Michigan Dairy Expo, a celebration of dairy farmers and dairy cattle in the Great Lakes State.

During the week there are breed shows and showmanship contests for 4-H youth as well as open shows for dairy enthusiasts of all ages. In addition to cattle events, there are three additional contests young people may participate in: Dairy Management/Skillathon Contest, Dairy Cattle Judging Contest, and Dairy Quiz Bowl. Make sure to view the registration information for contest descriptions, rules, and additional information.

Contact: Melissa Elischer (email: [elischer@msu.edu](mailto:elischer@msu.edu))

Register at: <https://www.canr.msu.edu/resources/michigan-4-h-youth-dairy-days-entry-information>



# News & Updates

All things dairy at MSU

## Veterinary student assignment published in scientific journal addressing dairy research needs

Three 2021 graduates of the Michigan State University College of Veterinary Medicine; Drs. Katy Kesler, Grace Longcore, and Alex Russell; have published one of their DVM course assignments as a knowledge summary in the journal *Veterinary Evidence*.

Their article, “A comparison of gonadotropin-releasing hormone and human chorionic gonadotropin in dairy cows with ovarian follicular cysts,” pinpoints a research need that could help dairy practitioners treat a harmful cattle disease.

In the text, Kesler, Longcore, and Russell compare the effectiveness of two well-known treatments (gonadotropin-releasing hormone and human chorionic gonadotropin) for cystic ovarian disease, which can affect dairy cattle after calving. For dairy producers, it is crucial to restore the health of affected cows as quickly as possible because if afflicted cattle are not rapidly identified and treated, they suffer from reduced reproductive efficiency, resulting in significant economic losses for the producer.



*Dr. Katy Kesler and a bovine friend.  
Photo courtesy Dr. Katy Kesler*

“Our knowledge summary aims to help veterinary practitioners who need to decide which treatment to use for cystic ovarian disease, which affects between 6 and 30 percent of dairy cattle—making it something that dairy practitioners encounter every day,” says Kesler.

The team’s comparison reveals a high level of debate among the scientific community as to which treatment is

more effective. “In our scenario,” says Kesler, “we were specifically evaluating which treatment resulted in a more rapid return to cyclicity—or which treatment cured cows more quickly. None of the articles we evaluated were able to provide evidence that one treatment was significantly more effective than another.”

The team’s process was methodical: after designing the clinical question they wanted to answer, they curated a list of search terms and synonyms (e.g. “bovine,” “cattle,” “cow,” “dairy,”) to scour major databases for related articles. After combing through search results (discarding articles that did not use the treatments in a way that allowed them to be compared, or that centered on other species of interest, such as sheep), they arrived at a narrowed-down list.

From there, each article was evaluated for study design, scientific rigor, outcomes, main findings, and the of limitations of each study.

“We then began compiling the information,” says Kesler. “In our scenario, there was a lot of disagreement in the conclusions of the articles. We really couldn’t say that one treatment is better than another. This isn’t discouraging; it simply means that there is a tremendous need for more research to be done on this topic.”

Knowing is half the battle; the summary arms practitioners with the knowledge that this particular clinical question has no clear answer currently. “Combining the literature into one place makes it more widely available and accessible for practitioners,” explains Kesler.

The knowledge summary was written based on work completed in a DVM course that was designed to provide direct value to real dairy practitioners. “In this assignment, students develop a knowledge summary based on a clinical query relevant to food animal production medicine,” says Dr. Ángel Abuelo, assistant professor in Cattle Health and Wellbeing, the instructor of the course. “I work with Michigan dairy practitioners to develop the clinical queries that students answer so that they are, one, relevant to practice and two, provide useful information to the practitioners themselves.”

# News & Updates

All things dairy at MSU

## Feeding: more than driving a tractor!

Do you know how to drive a tractor? Can you be here on time? Would you avoid breaking things? If your answer is yes, welcome! You are our new feeder!

Too often these are the only requirements on dairies to promote or hire a new feeder. Recently, MSU Extension began feed program evaluations, and we have found that feeder training is lagging behind that of other positions on the farm. We have all heard that feed is the number one expense on a dairy, accounting for up to 60% of the operating costs. As such, the feeder's role needs to be treated as the important technical job it is.

Feeding requires a set of skills and knowledge to perform procedures correctly in an efficient and consistent manner. But there is a lack of standardized practical training to increase the capacity of the feeder to perform its job. That will change when registration for the MSU Extension Feeder School program opens in early July. This short course is designed to provide feeders with the foundation to understand, monitor, and troubleshoot the procedures involved in feeding on a dairy. The inaugural session will be offered in three locations around the state starting in late July, consisting of two four-hour sections for each location. To receive details or more information, please email [carrasq1@msu.edu](mailto:carrasq1@msu.edu) and be on the lookout for more details on the MSU Extension dairy team website.

By *Martin J Mangual*



## More than \$2.3 million to support Michigan animal agriculture research, outreach

The Michigan Alliance for Animal Agriculture (M-AAA) is investing more than \$2.3 million in 26 new research and outreach projects in 2022. With support from the Michigan Legislature, the funding is available under the current fiscal year 2021-22 budget through the Michigan Department of Agriculture and Rural Development (MDARD).

The M-AAA is a partnership among MDARD, animal agriculture industry groups and Michigan State University aimed at advancing the animal agriculture economy across the state. "The agriculture sector in Michigan is facing uncertainties from a variety of sources," said George Smith, director of MSU AgBioResearch and a leader in the M-AAA. "Producers are faced with short-term issues such as rising input costs, while also dealing with long-term questions around sustainability and profitability. Our partners in the M-AAA are dedicated to helping producers find solutions that propel Michigan's animal agriculture industries into the future." For this funding cycle, the projects cover a range of topics, including disease-related challenges and exploring ways to increase dairy profitability. "We appreciate the opportunity to partner with MSU and provide input on critical research needs of the dairy industry," said Sheila Burkhardt, senior director of member and government relations for the Michigan Milk Producers Association. "The M-AAA-funded research projects allow us to be on the cutting edge, while providing solutions that will make a lasting impact on dairies throughout Michigan." M-AAA projects are either one or two years in duration and are slotted into one of three categories: applied research, extension or seed funding. Researchers and outreach specialists are evaluated throughout the process and must submit progress reports and final summaries to M-AAA leaders.

Examples of 2022 projects include:

- Angel Abuelo, an assistant professor of dairy cattle health and well-being in the Department of Large Animal Clinical Sciences, is studying the efficacy of vaccine boosters for newborn calves to better protect against illnesses such as bovine respiratory disease. Results from the project will inform vaccination strategies for improved calf health and will be shared through outreach programs with producers, herd consultants and veterinarians.

By *Cameron Rudolph*

[View full article here](#)



# History

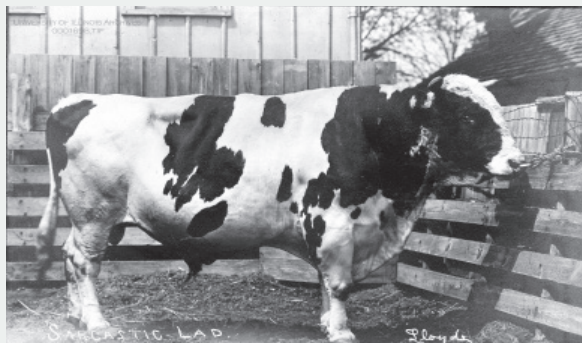
## Belle Sarcastic (1890-1903) & Sarcastic Lad (1897-)

Belle Sarcastic was a Holstein-Friesian cow owned by the Michigan Agricultural College in the 1890s. For a dairy cow, she garnered quite a bit of fame in her lifetime, and was a source of great pride for the College.

She was bred by H. P. Doane of Duffield in Genesee County, and calved on January 18, 1890. Belle was acquired by the College soon after, but nearly became an early cull. In 1893, Clinton D. Smith arrived at M.A.C. to become Professor of Practical Agriculture and Superintendent of the Farm. He described three-year-old Belle Sarcastic as “decidedly beefy and steer-like,” “simply a square brick,” and deemed her unfit as a dairy cow. Smith later wrote,

“As I made my first official visit and inspection, I told the herdsman, Richard Harrison, the best cow feeder in America, that there was one heifer that should go to the block. His mind was less clouded by theory than mine, and he plead for her life for another year. I let her live. You know the result.”[Holstein-Friesian Herd-Book, vol. 19, p. 76]

The result was that within a year, Belle had given birth to her second calf and, to Smith’s surprise, “from a fine beef animal, she developed into an ideal dairy cow.” Although her milk and butterfat production were prodigious, she “consumed absolutely less than the standard required,” with “dainty” eating habits and, somewhat idiosyncratically, “a very strong liking for roots.” In 1895 she gave milk for 738 pounds of butter, a feat that Professor Beal saw fit to include in his “College as a River” timeline, a foldout addendum to his History of the Michigan Agricultural College. Two years later Belle outdid herself, producing 23,190 pounds of milk and 722 pounds of fat—a world record that stood for eleven years.



Courtesy of the University of Illinois Archives

Belle Sarcastic’s greatest production, however, was undoubtedly her son: Sarcastic Lad, bred at the College and calved on October 18, 1897. The bull was sold before birth to noted breeders W. J. Gillett & Son of Rosendale, Wisconsin. In 1904, Sarcastic Lad was exhibited by the “World’s Fair Holstein Association” at the Louisiana Purchase Exposition in St. Louis—better known as the St. Louis World’s Fair—and won the Grand Champion title in his class (and a \$75 prize). He was described as “a typical dairy bull, weighing 2,200 pounds, [with] the active, aggressive dairy temperament. He walks as if he owned the earth.”[37th Annual Report, Missouri State Board of Agriculture (1905), p. 343]

After the fair he was acquired by the University of Illinois at Urbana, where he headed that school’s herd. Sarcastic Lad would go on to become “one of the noted sires of the breed,” renowned for passing along his dam’s “ideal dairy cow” aspects to his scores of children, hundreds of grandchildren, and generations beyond. Today it is estimated that thousands of registered Holsteins worldwide can trace their bloodlines to Sarcastic Lad.

By Kevin S. Forsyth (MSU 1991)

View article at: <https://kevinforsyth.net/ELMI/belle-sarcastic.htm> (reprinted with permission)

# Management Tips

MSU Dairy Extension Team



Victor Malacco

## Promises and potential of automated milking systems

The automation of many processes in farming in both crop production and animal care has been increasing. One automation, using robots on small and large farms worldwide, has led to improvements in labor efficiency, animal wellbeing and changes in the quality of life for farm owners and employees.

The milking routine is unquestionably the most time-consuming chore on dairies, and its automation represents a relief for most farmers. The automatic milking system (AMS) is not an entirely new technology, as the first AMS was installed in the Netherlands in 1992. The most immediate advantage of this technology is that it allows cows to be milked several times a day, in the automated system, without requiring much human labor.

Spared labor from the milking routine is not the only advantage realized when this system is adopted. The fully automatic milking package also provides essential information to the farmers regarding individual cow health, welfare, behavior, and nutrition. This gives producers a valuable source of data that can be used in the decision-making process on the farm.

Michigan's first AMS system was installed in 2009. According to Michigan Department of Agriculture and Rural Development (MDARD) data, there are currently 243 robotic milking units up and running on 55 farms in the state.

By Victor Malacco

[View full article here](#)



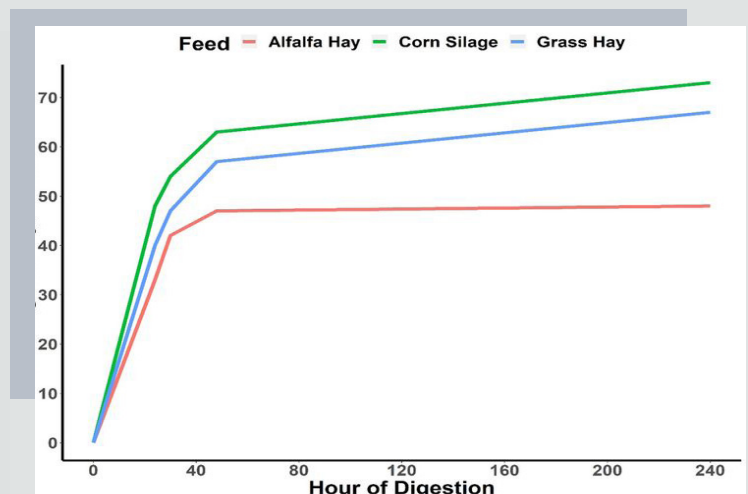
## Getting the most out of your forage evaluation: Understanding NDF digestibility

Transforming fiber into energy and protein for human nutrition is a key role of ruminants in our food system. Furthermore, producing and utilizing high-quality forages is a key determinant of dairy farm profitability. Analyses that help farms assess forage quality are widely used and heavily influence ingredient purchasing and diet formulation for dairy cattle.

Neutral detergent fiber (NDF) is a measure of the proportion of cell wall in plant tissue, expressed as a proportion of total dry matter. Adequate NDF in dairy cow diets enables proper rumen function and rumen mat formation, but the challenge of feeding increasing NDF concentrations to high-producing dairy cows is that it may lead to excessive gut fill and limit feed intake.

To strike the right balance between feeding enough NDF to support rumen function without feeding so much that it limits feed intake, dairies have become increasingly reliant on in vitro NDF digestibility (ivNDFD) measures. The ivNDFD is the proportion of NDF that is digested after some amount of time (24, 30, 48, or 240 hours) in a flask with buffered rumen fluid (containing live ruminal bacteria) from a donor cow. Undigested NDF (uNDF) is a related measure and is simply the portion of NDF that was not digested after some time (usually 240 hours) of in vitro fermentation. Typically, both ivNDFD and uNDF are expressed as a proportion of NDF within the feedstuff, such that  $ivNDFD + uNDF = 100\%$ .

By Kirby Krogstad and Barry Bradford



[View full article here](#)



# Management Tips

MSU Dairy Extension Team



Charles Gould

## Compost handling in agriculture systems: Right-to-Farm coverage of on-farm compost production

The controlled biological decomposition of organic matter results in compost. Therefore, by definition, manure that is not managed by generally accepted compost production standards cannot be called compost. At best, it is decomposing manure.

### *Uses and benefits of compost*

Compost has many uses and benefits in a cropping system if proper application is followed. For example, compost encourages the formation of appropriately sized soil aggregates, which protect the soil from erosion and compaction. Compost also enhances soil fertility through the slow release of macro- and micro-nutrients, as well as improving the availability of nutrients to growing crops. Most importantly, compost helps support living biological systems by imparting soil with beneficial microorganisms that suppress or control soil-borne plant pathogens. These suppressive qualities occur in compost made with specific feedstocks for specific cropping systems. Feedstocks, in this context, refer to the organic matter used to supply the carbon and nitrogen necessary for compost production. Examples of carbon feedstocks include sawdust and straw. Examples of nitrogen feedstocks include manure and fresh grass clippings.



### *What does it mean to have Right-to-Farm coverage?*

The Michigan legislature passed into law the Michigan Right to Farm (RTF) Act (Act 93 of 1981). The Michigan RTF Act requires the establishment of Generally Accepted Agricultural Management Practices (GAAMPs).

*By Charles Gould*

[View full article here](#)

## Newborn dairy calf care management

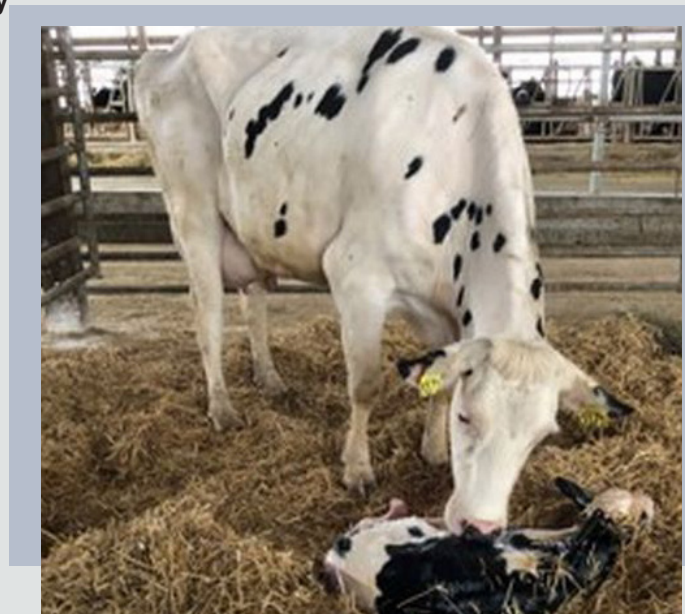
The first hours of life are decisive for a newborn dairy calf. In this phase, failure in management and procedures can lead to increased incidence of diseases, decreased growth rate and increased mortality rates. We often think about colostrum feeding when we think about newborn calf care. Though it is one of the most critical steps, newborn calf care should not stop there. This article will talk about three essential steps that should be taken once a dairy calf is born.

### **Step 1: Dip navel in a 7% tincture iodine solution immediately after birth**

During birth, the umbilical cord rupture leaves an open door for environmental pathogens to access internal structures and the organs connected to them. Under normal conditions and without infection, the navel will dry, and its structures will atrophy. Navel infection rates of 1-14% are reported worldwide, often due to pathogens found maternity pens and calf housing areas. Higher than the direct costs of the navel infection treatment are the costs of associated diseases and their long-term effects. The local infection can be spread by the blood circulation to joints, lungs, and kidneys, causing complications, decreased growth rate, and increased mortality rates.

Using a navel dip solution will prevent infections by killing pathogens and accelerating the drying process of the umbilical cord. The gold standard solution for navel dip is 7% tincture of iodine.

*By Victor Malacco*



[View full article here](#)

# Management Tips

MSU Dairy Extension Team



Lynn Olthof Barry Bradford

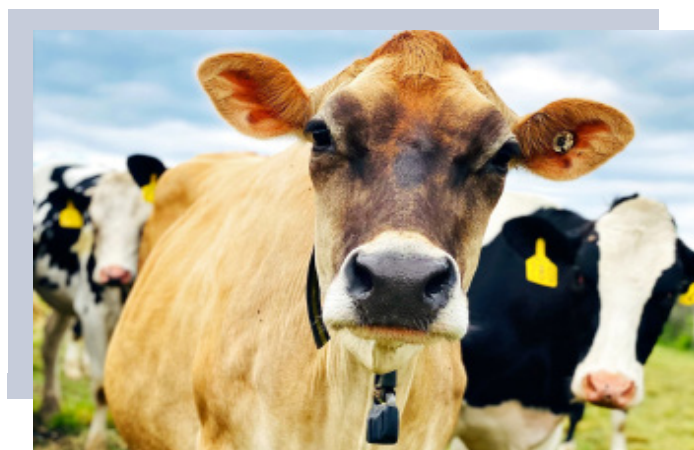
## Are Holstein or Jersey cows more profitable?

It seems like a debate that never ends: are Jersey or Holstein cows the better choice for profitable dairy production? The question of breed profitability and efficiency has again come to the forefront as producers face increasing feed costs and volatile milk prices. Unfortunately, there is a lack of solid data available to objectively evaluate claims on either side of the debate.

A recent Michigan State University study evaluated costs and revenues of Jersey and Holstein cows managed in the same manner and location on three dairy farms in or near Michigan. The study found that Holstein cows were, on average, \$456 more profitable per cow annually than Jersey cows. 77% of the revenue advantage for Holsteins came from producing about 810 additional pounds of components annually, which was not compensated for by the lower cost of production for Jersey cows. Importantly, the financial advantage for Holsteins was similar across all 3 dairies, increasing confidence in the findings.

These results do not apply to new facilities, where cost savings from scaling to the smaller Jersey cow may narrow the gap. In the current financial environment in Michigan, though, transitioning from Holstein to Jersey cows in existing facilities does not appear to be a profitable decision for most dairy farms.

By Lynn Olthof and Barry Bradford



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## 2021 Michigan Forage Variety Test Report

Forage crops are essential components of diversified agricultural production systems in Michigan. They provide feed for livestock, fix nitrogen for crop rotations, reduce soil erosion, improve soil structure, fertility and water retention, protect water quality, provide habitat for wildlife, generate biomass for fuel conversion, and add eye appeal to landscapes. Competition from row crops for land use continues to squeeze forage production acres while equipment, land, and labor costs increase. Michigan hay prices were strong in 2021, and a one-ton yield increase of average quality alfalfa hay was worth \$160 to \$190/acre.

Under these market conditions, the importance of improving yield per acre through use of better forage varieties is an important component of profitability. This report contains yield data totals from 2021. Yield data for individual cuttings from previous years are in the variety test report archive on the MSU Forage Connection website at:

<http://www.forage.msu.edu/publications>.

By Kim Cassida, Joe Paling, James DeDecker and Christian Kapp

To view full report visit: <https://forage.msu.edu/wp-content/uploads/2022/04/2021-Michigan-Forage-Variety-Report-Web-Version.pdf>



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### 2021 Michigan Forage Variety Test Report

Kim Cassida, Joe Paling, James DeDecker and Christian Kapp  
Forage Factsheet #22-01



Forage crops are essential components of diversified agricultural production systems in Michigan. They provide feed for livestock, fix nitrogen for crop rotations, reduce soil erosion, improve soil structure, fertility and water retention, protect water quality, provide habitat for wildlife, generate biomass for fuel conversion, and add eye appeal to landscapes. Competition from row crops for land use continues to squeeze forage production acres while equipment, land, and labor costs increase. Michigan hay prices were strong in 2021, and a one-ton yield increase of average quality alfalfa hay was worth \$160 to \$190/acre. Under these market conditions, the importance of improving yield per acre through use of better forage varieties is an important component of profitability. This report contains yield data totals from 2021. Yield data for individual cuttings from previous years are in the variety test report archive on the MSU Forage Connection website at <http://www.forage.msu.edu/publications>.

#### 2021 Conditions

Annual rainfall total and 30-year averages for April through October in East Lansing in southern Lower Michigan, and Chatham in the Upper Peninsula are in **Table 1**. Weather conditions at test sites were typical of conditions across upper and lower Michigan. Last winter was mild and dry. Some counties entered drought classification in spring. Weather conditions in general were very good for planting of spring-seeded forage crops. In many counties perennial forage growth was slower than usual in May due to the combination of cooler than normal temperatures, late frosts, and drought. Many perennial forages matured a few days later than in recent years. As a result, first cutting yields were lower than normal across much of the state, but ample rainfall beginning in June supported excellent forage regrowth in second and later cuttings. Weather conditions were good for haymaking late in May and the first week of June in southern Michigan, but rain events hampered cutting and harvesting in early July and again in August. There were at least three events of heavy rain and localized flooding from late June to mid-August and another in October in some lower counties. Rainfall was below normal for much of the summer at Chatham, where June was the only month that reached average rainfall totals, with most of that rainfall in the last 10 days of June. Temperatures at Chatham were above average for much of the summer, with growing degree day accumulation April - October (base 4 F)

relative differences among tests conducted across different years. The relative difference among varieties is expressed as a **percentage of the check variety yield**. Check varieties are chosen for suitability across a wide area of the USA. Where meaningful check varieties are not available, relative differences are expressed as a **percentage of the test average**. The reliability of variety rankings increases with the number of environments (i.e. the number of tests) in which the variety has been tested.

**Statistical comparisons** allow accurate separation of true genetic effects from random variation attributed to field or weather conditions within an individual test. Comparison of yields among varieties should only be made within a trial. The **Least Significant Difference (LSD)** is the key statistic for comparing two varieties. When the difference in average yield between two varieties is greater than the LSD value, the varieties are likely to be truly different. The **Coefficient of Variation (CV)** provides an estimate of overall procedural and environmental variability in a test or cutting. When CV is greater than 10%, it can be difficult to detect genetic differences in variety performance. High CV can be related to low yields and environmental stress.

**Alfalfa Variety Trials**

Long-term yield summaries for alfalfa varieties planted at multiple locations in Michigan variety

ferility and pest control. All plots are planted into prepared seedbeds using a cultipacker seeder. Alfalfa and red clover plots are 3 feet wide and 20-23 feet long. Grass plots are 20-23 feet long and 5 feet wide. Annual grass plots measure 15-20 ft long x 5 ft wide. Only the center 3 ft of 5-ft wide plots is harvested. Phosphorus, potassium, and sulfur are applied according to soil test and MSUE recommendations for the species. Perennial and annual grass plots receive 50 lb of N in spring and again after first cutting. Spring small grains receive 100 lb N topdressed after emergence, while winter small grain plots receive 50 lb N at planting and 100 lb in spring. Weeds and insects are controlled as needed. Plots may be irrigated if needed to prevent establishment failure but are usually not irrigated during production years. This provides information about variety resilience to variation in precipitation.

The number of harvests per year depends on species, location, and weather. Intensive five-cut alfalfa systems are possible in southern counties, but it is rarely practical to get more than three alfalfa cuts in the Upper Peninsula. Grasses regrow more slowly and provide fewer cuttings than alfalfa. Harvest targets are late bud for alfalfa, early bloom for red clover and grasses, and flag leaf for small grains. Tests are harvested using a forage plot flail harvester set at a 3 or 4 inch stubble height, depending on the



# Research Drill Down

Pamela L. Ruegg, DVM, MPVM

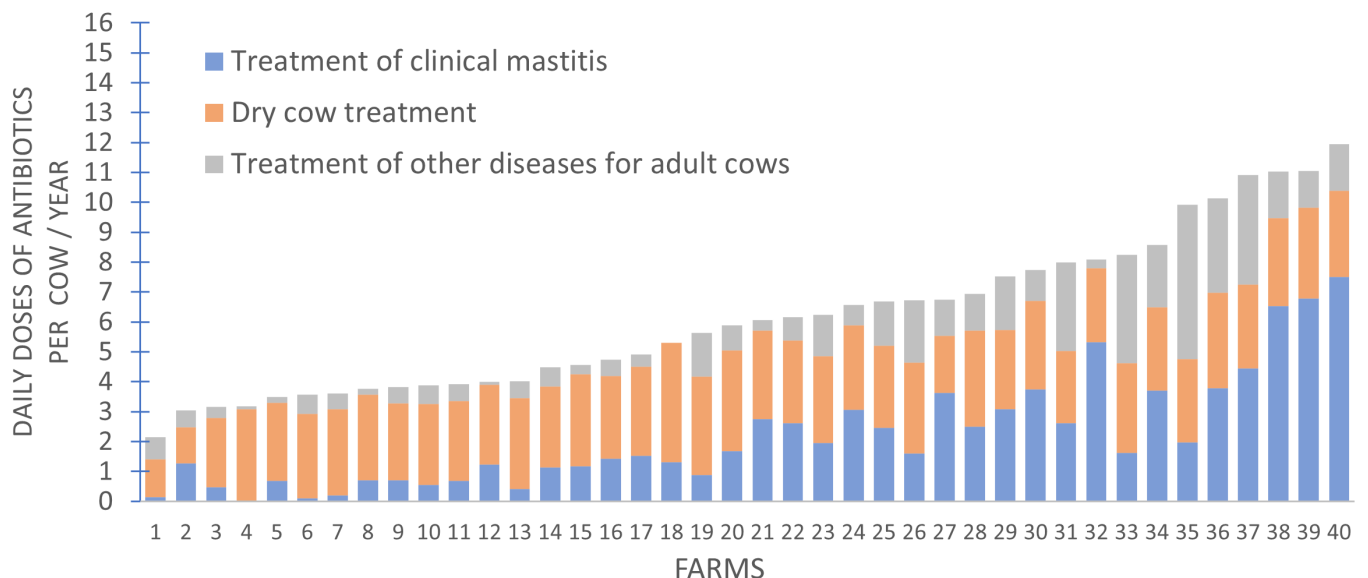
## Myth Busting Mastitis Therapy

**Antibiotic usage is an important tool for conventional dairy farmers, but it is important to ensure that antibiotic usage is minimized to only that needed to maintain animal welfare and farm sustainability. Inappropriate usage of antibiotics includes both overtreatment (using antibiotics when not necessary) and undertreatment (not giving antibiotic treatments to an animal that may benefit).**

The focus of much of my current research program is to develop evidence-based guidelines that help farmers and their veterinarians understand when antibiotic usage is both cost effective and beneficial to the animals. Using antibiotics in this manner is called “Antibiotic Stewardship” and adopting principles of antibiotic stewardship on dairy farms can have economic benefits for farmers. Much of our research the last few years has been focused on practical ways to improve antibiotic stewardship on dairy farms and we have performed several studies that together are busting myths about mastitis therapy.

As part of a USDA funded study (USDA NIFA #2018-68003-28151) that started in 2017 (before I relocated to MSU early in 2018), we worked with a team of researchers from the University of Wisconsin-Madison to collect animal health and treatment data from 40 large WI dairy farms that contain >55,000 lactating cows. While the overall objectives were focused on risk factors for exposure of farm workers to resistant bacteria, we also sought to determine how farms varied in usage of antibiotics and what diseases accounted for most antibiotic usage. MSU PhD student Juliana Leite de Campos collected and analyzed this data and published a 2021 Journal of Dairy Science paper (J Dairy Sci, 104:4727-4745) that demonstrated that the number of daily doses of antibiotics per cow per year varied enormously among farms. The least using farms used about 2 daily doses per cow per year, while the greatest using farms used 6 times as much (Figure 1). Antibiotic treatment of dry cows and of clinical mastitis cases accounted for >75% of all antibiotic usage. One take home message from this study was that many farms can reduce antibiotic usage by changing protocols used for mastitis treatments and for dry cow

**Figure 1:** Annual antibiotic usage on dairy farms in WI from Leite De Campos et al., JDS 104:4727-4745



therapy.

Further analysis of this data has been recently performed by MSU post-doctoral research associate Dr. Juliano Goncalves, who used a subset of this data containing about 53,000 cows from 37 herds to look at data about individual cow treatments. In this study, he reported a total of 32,000 first cases of diseases (recurrences were not included). Clinical mastitis accounted for about 44% of all recorded first disease cases (Figure 2; J. Goncalves., J. Leite de Campos and P. Ruegg, 2022 submitted to Journal of Dairy Science). Interestingly, 35% of mastitis cases were not treated with antibiotics and the 2 most common treatments were intramammary administration of ceftiofur (SpectramastLC; 54% of cases) or cephalixin (Today; 6% cases). This proportion of non-treated cases is much greater than previously reported and is a result of farmers adopting selective treatment of non-severe clinical mastitis, often using simple, culture based selective agar to guide treatment decisions. In most selective treatment programs for clinical mastitis, no antibiotic therapy is recommended for non-severe cases that are culture negative or Gram-negative while intramammary antibiotics are recommended for cases that have Gram-positive growth.

While treatments for non-severe clinical mastitis are usually based on use of on-farm culture to identify culture-negative cases (no antibiotics are recommended) and differentiate Gram positive (antibiotics recommended) from Gram negative bacteria (antibiotics not normally

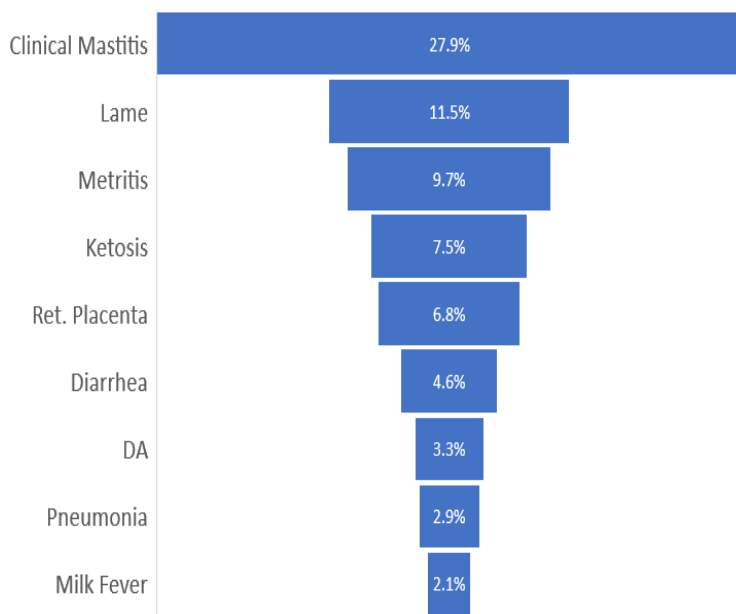


Quinn Kolar, Juliana Leite De Campos, Pamela Ruegg, and Cara Robison

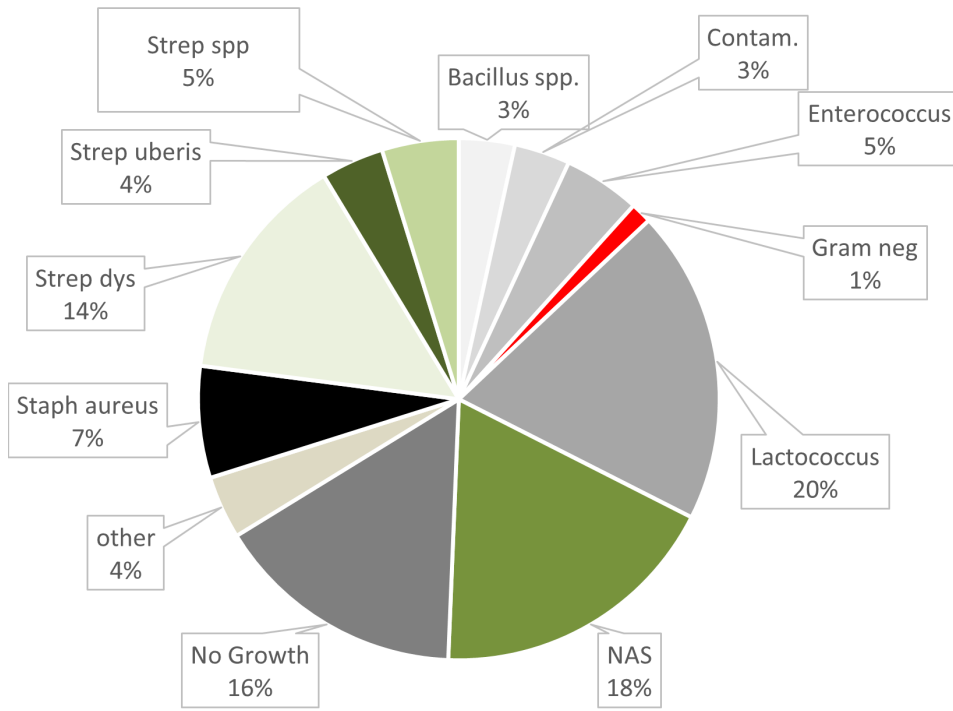
recommended), recent advances in diagnostic testing have demonstrated that bacteria that are called “Gram-positive” are not all Streptococci and Staphylococci but may consist of infections caused by a very diverse group of Gram-positive environmental organisms. The approved intramammary antibiotics have not been tested for efficacy against many of these organisms and we don’t know if antibiotic usage is beneficial.

To help answer these questions, MSU PhD student Quinn Kolar recently completed a clinical trial funded by the Michigan Alliance of Animal Agriculture (M-AAA, 19-009). In that clinical trial we enrolled about 250 cases of non-severe clinical mastitis from 4 commercial farms (3 in Michigan and 1 in MN). All enrolled cases were confirmed as caused by Gram-positive bacteria by growth using commercially available on-farm culture plates. In addition to results of on-farm culture, we collected duplicate quarter-milk samples and identified bacteria using advanced methods (Maldi-Tof). The bacteria that were initially identified as “Gram-positive” using on-farm culture were actually a very diverse group of organisms (Figure 3). Approved intramammary antibiotics have only been tested to be effective against the Streptococci and non-aureus Staphylococci species (18%). Thus, the correct duration and effectiveness of antibiotic treatments for >50% of Gram-positive bacteria are not known.

**Figure 2:** Frequency of disease in 37 large dairy farms containing 50,329 cow-lactations (Goncalves et al., submitted 2022).







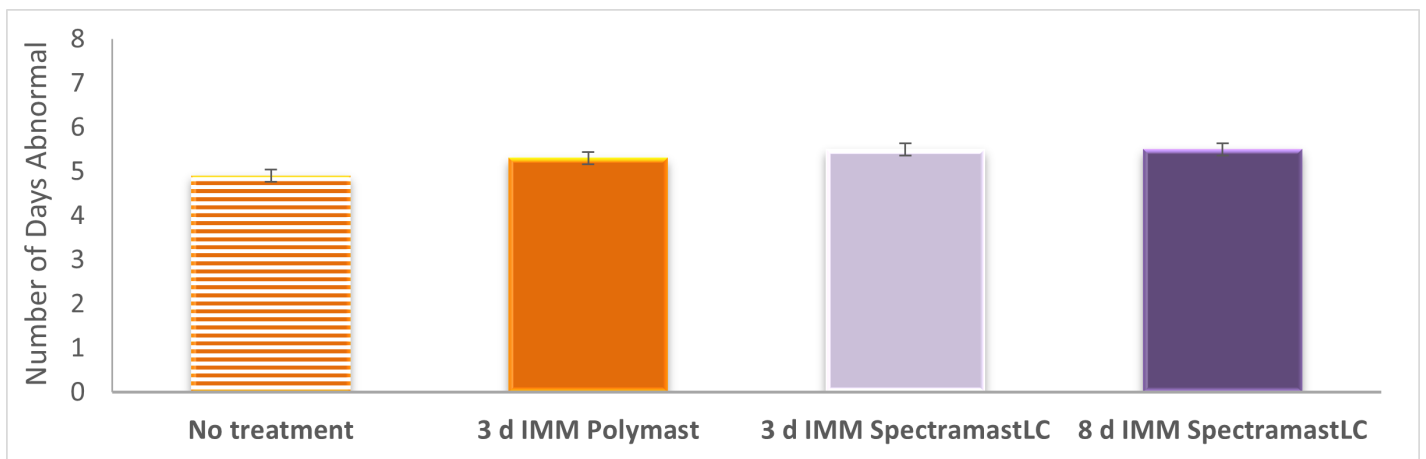
**Figure 3:** Maldi identification of mastitis pathogens diagnosed as gram positive using triplate samples (from Kolar, Godden, Erskine and Ruegg, 2021)

To evaluate the efficacy of current treatments, we randomly assigned the enrolled cows to 4 different interventions: 1. 3 days of intramammary Polymast® (n = 57 cases), 2. 3 days of intramammary SpectramastLC® (n = 52 cases), 3. 8 days of intramammary SpectramastLC® (n = 62 cases) or 4. No treatments at all (n = 25 cases). The results of this study have not yet been submitted for publication but our preliminary analysis showed no differences in bacteriological cure, post-treatment SCC, recurrence of another clinical case or number of days of abnormal milk (Figure 4) among treatments or based on duration of therapy. Cows that received 8-d SpectramastLC® produced slightly more milk than cows in the other

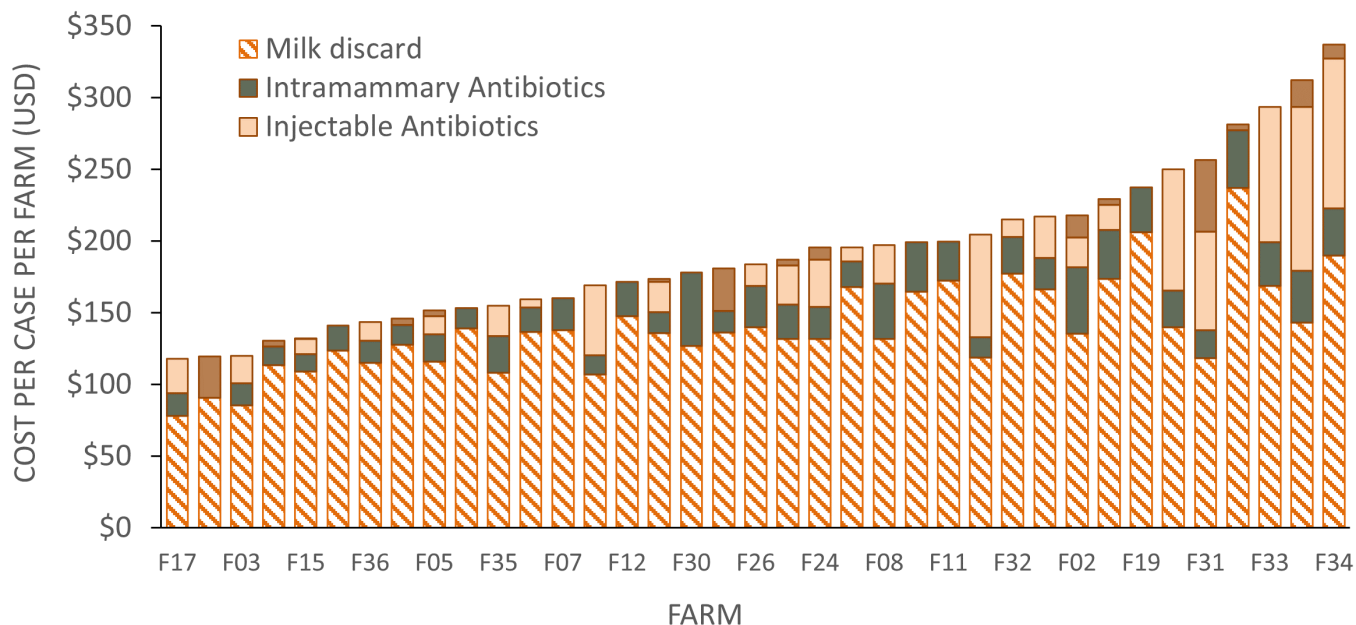
groups, but the difference didn't make up for the greater amount of milk discarded during the treatment period. Based on the results of this clinical trial, it appears that there were no differences among the antibiotics we compared, and we recommend that for routine mastitis treatment of non-severe clinical mastitis producers use the shortest duration of the approved product that is listed on the product label.

Finally, we used our 37-herd dataset to evaluate variation in costs of mastitis treatments on dairy farms. As part of her PhD dissertation, Juliana Leite de Campos demonstrated that farmers spend between about \$125 and \$300 per case in direct treatment costs

**Figure 4:** Days of abnormal milk for mastitis caused by gram positive (n = 240) cases of non-severe clinical mastitis enrolled in a randomized clinical trial (Kolar et al, preliminary data 2022)



**Figure 5:** Direct treatment costs of clinical mastitis among 37 herds (Leite De Campos et al., 2022)



(costs of milk discard, intramammary and systemic antibiotics and supportive drugs; Figure 5). Of direct costs, 80% are related to costs of milk discard, which increase as duration increases. Each additional day adds considerable costs without improving outcomes, and many farms can save money by reducing the number of treatment days.

Overall, through this series of studies, we have learned that use of antibiotics varies among farms, primarily due to differences in occurrence and treatment protocols for clinical mastitis. **We can reduce costs of treatment and reduce the number of doses of antibiotics used on dairy farms by modest changes to the way that we treat mastitis.**

- Most non-severe cases of clinical mastitis that are caused by E. coli or are culture negative when detected don't require antibiotic therapy as the spontaneous cure rate is similar to the treatment cure rate.
- When cultures of milk from non-severe cases of clinical mastitis result in Gram-positive growth, we recommend that intramammary antibiotics are given for the shortest duration that is listed on the product label.

These changes in mastitis treatment protocols can result in considerable savings for the farmer without negatively impacting animal welfare or productivity. To implement these actions on farms requires good detection systems for non-severe cases, as well as the ability to collect and culture milk samples from affected cows. Our ongoing research is focused on development of decision tools that can help farmers identify cows that may not benefit from antibiotic therapy (based on history and other information) and can be managed in a sustainable and cost-effective manner.

## Meet the Author



**Pamela L. Ruegg**  
 David J. Ellis Chair in  
 Antimicrobial Resistance  
 Professor  
 Large Animal Clinical  
 Sciences



# Michigan Dairy Recognition

Shining a light on industry leaders



## Don Martell

Don Martel was recognized as a 2022 Honoree of the Michigan Dairy Memorial and Scholarship Foundation. Don Martell started working with the Michigan dairy industry in 1975. He grew up on his family's dairy farm in Berrien County near Three Oaks, MI. He graduated from Michigan State University in 1975 with a Bachelor of Science in dairy science. His education turned into a love for the dairy industry, and he always promoted the dairy industry and MSU.

Don worked five years (1975-1980) for Michigan State University Extension and the Michigan Dairy Herd Improvement Association (DHIA) as a fieldman. He then moved into dairy nutrition. He was a dairy consultant for Purina Mills for 21 years (1980-2001), and then with Diamond V as a dairy field technical specialist for 17 years (2001-2018). In those roles, he provided sales and technical assistance to dairy farmers, nutritionists, and veterinarians in the U.S. and Canada.



## Gary Trimner

In recognition of Gary Trimner's 35 years of service and commitment to the members of Michigan Milk Producers Association, the MMPA Board of Directors is pleased to recognize Gary as an Honoree of the Michigan Dairy Memorial and Scholarship Foundation.

Like many MMPA employees, Gary grew up with a passion for dairy farming, but never had the opportunity to own a farm. So, he chose the next best thing to him—working with dairy farmers. Gary dedicated his 35-year career to helping dairy farmers and fellow employees achieve their goals. Gary, who grew up in Hersey, Michigan developed a passion for cows and farming while working on his family's farm. After graduating high school, he attended college at Ferris State University.

Throughout his time at MMPA, Gary worked diligently and passionately to help MMPA members be as productive as possible. Under Gary's leadership, MMPA members became known for their high quality milk production.



## MSU dairy science alum establishes discretionary endowment for animal science

MSU dairy science alumnus, William (Bill) Oswalt, of Vicksburg, Michigan, has established a new endowment to provide discretionary support for the MSU Department of Animal Science within the College of Agriculture and Natural Resources.

"We are so grateful for Mr. Oswalt's generosity and thoughtfulness to provide such flexibility for the future," said Catherine Ernst, Ph.D., chairperson for the Department of Animal Science. "This gift is powerful because of its discretionary nature. Future department chairs will be able to respond to changing programmatic needs by directing expenditures toward the most pressing needs at the time. Mr. Oswalt's generosity will have a tremendous and long-lasting impact on our students and faculty and will provide vital support for enhancing our animal science teaching, research and outreach missions."

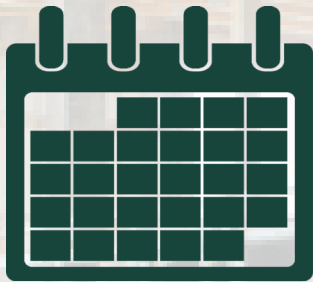
William (Bill) Oswalt Mike Oswalt

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- [Field Crops Virtual Breakfast](#)  
April - September (Every Thursday)
- [Dairy Open House](#)  
July 19
- [Dairy Feeder Training Schools](#)  
July 27- Aug. 10
- [Michigan Dairy Expo and Michigan 4-H Youth Dairy Days](#)  
July 18-22
- [Breakfast on the Farm - Risky Endeavor Dairy](#)  
September 24