Spartan Dairy

Newsletter

Summer 2024 Vol.4 No.2

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Dairy at MSU

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New Dairy Facility

MSU breaks ground on the updated Dairy Cattle Teaching and Research Center

MSU broke ground on two new infrastructure projects that are critical to the future of Michigan food production and agriculture. Construction began on an updated, state-of-the-art Dairy Cattle Teaching and Research Center, as well as substantial renovations and additions to the Plant Science Greenhouses.

The new and renovated spaces will expand research capacity for MSU scientists in the colleges of Agriculture and Natural Resources, Natural Science and Veterinary Medicine, including research funded by MSU AgBioResearch.

The State of Michigan provided $53 million for partial funding of each project. Both projects received strong bipartisan support from Michigan's agricultural community. MSU and community leaders attended the Dairy Cattle Teaching and Research Center groundbreaking on Thursday, April 11.

"Not only do these two facilities play a vital role in supporting our agricultural partners with cutting-edge knowledge, but they are crucial assets to develop the next generation of dairy industry and plant science leaders," said MSU President Kevin M. Guskiewicz. "These much-needed facility enhancements will serve MSU students, scientists and stakeholders well into the future, and we are grateful to the Legislature and governor for their support."

Kelly Millenbah, dean of the College of Agriculture and Natural Resources, speaks during the groundbreaking event. Photo by Thomas Gennara.

The existing MSU Dairy Cattle Teaching and Research Center currently houses 250 dairy cattle and supports the research of faculty in the colleges of Agriculture and Natural Resources and Veterinary Medicine. The new dairy facility will expand research capacity by increasing herd size to 680 in addition to creating modernized barns, feed centers, milking parlors and laboratories. The new facility also will provide spaces for student instruction. The project is budgeted at $75 million.

The current dairy facility (background) with the illustrated future facility (foreground).

"This new dairy facility will stand as a testament to the power of partnerships," said Kelly Millenbah, dean of the College of Agriculture and Natural Resources. "These spaces for research, education and outreach will serve Michigan's farmers and develop tomorrow's workforce, and we're so grateful for this investment in the future of agriculture at Michigan State."

The College of Veterinary Medicine also will benefit from the new research center. "The dairy industry has advanced well beyond the center's current capacity, particularly in regard to research potential and teaching modern production practices," said Doug Freeman, interim dean of the College of Veterinary Medicine. "As we train the next generation of veterinarians, the center will allow them to develop significantly enhanced skills in dairy production medicine, which will enable them to serve clients and better protect local and global food systems."

By Kim Ward

View full article here

Dairy Spotlight

Zelmar Rodriguez and Samantha Wolfe

Zelmar Rodriguez
Assistant Professor

I grew up in Montevideo, the capital city of Uruguay, a country where beef cattle traditions are deeply ingrained in its national identity. From a very young age, I've been passionate about animal care, which led me to pursue a career in veterinary medicine. During my initial year at veterinary college, I was introduced to dairy production. As someone with little previous contact with dairy cows, I found the dairy system both complex and challenging, and it quickly became my passion and focus.

After graduation, I worked for a few years in the dairy industry, mainly on dairy calves' health, and then I moved to New Zealand where I spent two years working mostly on milk quality and hoof health. Wanting to learn more about cattle health, I pursued a PhD in veterinary population medicine at the University of Minnesota. Soon after, I took a postdoctoral position at Michigan State University to work on milk quality research.

Today, as an assistant professor and dairy extension veterinarian, I lead an integrated research and extension program that allows me to develop fully applied research. My focus is on developing effective management strategies to improve the profitability and sustainability of dairy farms by optimizing disease control and milk quality. In addition to my research, I am dedicated to educating veterinary and graduate students on the practical application of epidemiological tools in preventing animal diseases.

I consider myself incredibly fortunate to be a member of MSU. Here, I have the opportunity to pursue my passion in a field I deeply care about, surrounded by supportive colleagues, engaged stakeholders, and motivated students.

Samantha Wolfe
Extension Educator

I work adjacent to the dairy industry with the AgrAbility project, which works with people in the agricultural industry who may have disabilities, chronic conditions, or injuries.

Working with AgrAbility offers many opportunities to visit farms and work directly with growers and producers, while improving quality of life and helping people stay safe at work. Through this program, we offer farm visits to assess farm operations, learn about their health conditions, and pair them with assistive technologies that make tasks easier, loads lighter, and workplaces safer. We work with everyone in the agriculture industry: clients are aged 12 to over 90, with conditions ranging from chronic health and symptoms of aging to acute injuries such as traumatic brain injury or an amputation, and we work with all farm sizes and all commodities.

Our small but mighty staff also includes a Spanish-speaking Certified Occupational Therapy Assistant, who provides arthritis screenings and assistance in Spanish with workers right onsite, and many of these clients work at dairies. Farming is dangerous, with injury rates higher than other industries (182 per 100,000 workers in 2021), and dairy and livestock farms see the most injuries due to the nature of the work. Injuries caused by cows accounted for 32% of injuries reported in Michigan, and 43% of injuries reported came from dairy farms, in 2020-2021, according to MSU Occupational and Environmental Medicine. There are no Generally Accepted Agriculture Management Practices (GAAMPs) for safe animal handling, so it falls to the individual to take necessary safety precautions, which can be inadvertently overlooked amidst familiarity and proficiency in tasks.

If you or someone you know may be interested in the AgrAbility program and having a free onsite assessment with our team, email me at wolfesa4@msu.edu, call the Benzie County office (231-882-0025) or the AgrAbility toll-free line at 1-800-956-4106.

News & Updates

All things dairy at MSU

GREAT LAKES REGIONAL DAIRY CONFERNCE

The 22nd Great Lakes Regional Dairy Conference (GLRDC) was held on Feb. 8-9, 2024, at the Soaring Eagle Casino and Resort in Mt. Pleasant Michigan.

- Over 425 attendees and sponsors attended the two-day program.
- Approximately 100 sponsors and exhibitors from various aspects of the dairy industry helped support and enhance the conference.
- The conference featured a variety of speakers and topics, including:
  - Updates on the new MSU Dairy research facility
  - Farm management strategies to improve profitability and farm longevity
  - Approaches to current reproductive management strategies to achieve high pregnancy rates
  - The importance of passive and active immunity for newborn calf health
  - Current opportunities for on-farm solar without using fields
  - Transition cow health strategies, including management of systemic inflammation, hyperketonemia, and calcium dynamics
  - Managing, recruiting, and maintaining employees while improving employee relations
  - Using technology to improve crop quality and efficiency
  - Feeding ruminal microbiomes to support cow health

Participants indicated the bilingual herdsperson sessions, breakout session offerings and expanded networking time for engagement and learning enhanced their experience and they look forward to attending again in 2025.

The planning committee is busy working on the 2025 conference and will post updates this fall to the GLRDC website at: www.glrdc.org.

News & Updates

MSU Dairy Education

Students succeed in the classroom and beyond

The 2023 to 2024 academic year was a great time for Spartan students studying dairy science! Students received scholarships, participated in extracurricular activities that took them across the country, and shared their experiences with prospective students.

Over 20 students joined the dairy education program in 2023, nine students graduated with a Bachelors of Science degree in animal science with a dairy concentration, and three students completed a two-year dairy management program through the Institute of Agricultural Technology (IAT).

Michigan Dairy Memorial and Scholarship Foundation

MSU students received $158,000 in scholarships to study dairy science in 2023. This includes 28 undergraduate students, six IAT students, and four graduate students in the College of Veterinary Medicine. Thanks to the generous support of donors, the Michigan Dairy Memorial and Scholarship Foundation (MDMSF) oversees the second-largest scholarship program in the MSU College of Agriculture and Natural Resources. The MDMSF was established in 1957 through contributions made in honor of individuals who have served the dairy industry. Income from the endowment has generated scholarships for deserving students who want to pursue careers associated with the dairy industry.

View full article here

Midwest Dairy Challenge

In February, nine dairy concentration students traveled to Green Bay, Wisconsin to participate in the Midwest Dairy Challenge. The trip included visits to Diedrich Farms, Libertyland Dairy, and Tauchen Valley Inc., panel discussions, and networking with other students and industry professionals. Recent dairy concentration spring 2024 graduate, Danielle Rummel and her aggregate team placed first in the Dairy B division. Dairy concentration senior Adalee Thelen and her aggregate team placed second in the Dairy C division.

National Dairy Challenge

The 2024 MSU National Dairy Challenge Team placed second in a competitive division at the national contest in Visalia, California. The team consisted of Adalee Thelen, Irie Moussiaux, Brianna Hill, and Danielle Rummel. They were coached by Dr. Roger Thomson and Dr. Joe Domecq. The team had the chance to visit several dairies throughout the week, network with other students and industry professionals, and sight see throughout the state of California. A special thank you to Wickstrom Jersey Farms, Inc., Calori-D Holsteins, and Tollcrest Dairy for hosting the team practices in California.

Richmond Black and White Days Collegiate Dairy Judging Contest

Three MSU dairy concentration students traveled to Utah to compete in the 2024 Richmond Black and White Days Collegiate Dairy Judging contest. Congratulations to Brianna Armbruster, Elizabeth Hyman, and Clea Moore who placed third overall. Elizabeth Hyman also placed fifth individually in reasons. Wayment Dairy and the Utah State Caine Dairy Teaching and Research Center hosted visits for the team. The MSU Dairy Judging program is looking forward to beginning another great season in the fall of 2024!

By Lynn Olthof

Congratulations to the 2023 Michigan Dairy Memorial and Scholarship Foundation recipients!

Brianna Hill, Danielle Rummel, Adalee Thelen, and Irie Moussiaux at the National Dairy Challenge.

Elizabeth Hyman, Brianna Armbruster, and Clea Moore in Utah.

News & Updates

Student professional development and activities

News & Updates

All things dairy at MSU

Martin Mangual

West Michigan Dairy Education Dinner

January marked both the beginning of a new year and the debut of a new dairy extension program from Michigan State University. The West Michigan Dairy Education Dinner hosted a full room of 34 attendees that directly represented over 12,000 dairy animals, plus another 60,000 in 53 additional herds served by the consultants and veterinarians. The topic for the night was “How to get more from your parlor.”

Dr. Roger Thomson is a veterinarian and milk quality consultant based in Battle Creek, Michigan. He presented novel research regarding milking efficiency and what we can do to improve it. The second speaker, Dr. Ron Erskine, focused on how “the more things change, the more they stay the same.” He reminded attendees of the importance of consistency in our basic practices to positively impact milk quality. He is a professor in the MSU College of Veterinary Medicine, and worked in private practice as a veterinarian prior to joining the university.

All surveyed participants agreed that the dinner increased their knowledge, and 19 out of 20 planned to implement changes in their dairy operations based on what they learned. All 19 expected those changes to have a moderate to major impact on their herds.

After the dinner event, some dairy producers followed up with our MSU Extension Educators and implemented some MSU Extension programs in their farms. These include four parlor evaluations and three milker training programs. Overall, the event included great education, a delicious dinner and ice cream bar to close a successful MSU Extension program. We plan to hold this program again in 2025 and hope to see you there!

By Martin Mangual

Heifer Academy Seminar Series

MSU Extension Educator Cora Okkema just completed a new webinar series on heifer management practices with practical applications to improve dairy operations. Each week, she spoke with an expert on an aspect of heifer management in a live webinar. 49 people attended the live seminars, and over 325 watched on YouTube or Spotify.

- Monitoring the future of your dairy: Heifer records - *Lauren Siver, UNIFORM-Agri*
- Short and long-term impacts of social housing on youngstock - *Emily Lindner, University of Florida*
- Capitalizing your heifer inventory through reproduction and reducing non-completion - *Kelly Sporer, CentralStar Cooperative*
- Sucessful pair or group rearing of calves: Common challenges and options for solutions - *Dr. Jennifer Van Os, University of Wisconsin-Madison*
- Dairy calves from weaning to four months of age - *Dr. Jud Heinrichs, Penn State University*
- Feeding and managing heat-stressed heifers - Dr. *Bethany Dado-Senn, Vita Plus Corp.*

To view the full seminar series, visit the @DairyMSU YouTube channel, or search for The Heifer Academy on Spotify.

By Cora Okkema

THE HEIFER ACADEMY

Management Tips

MSU Dairy Extension Team

J. Richard Pursley

Determining the causes of pregnancy loss in lactating dairy cows

The Pursley Lab developed a novel approach for early pregnancy detection through daily monitoring of pregnancy-associated glycoproteins (PAGs). The conceptus (embryonic and extra-embryonic structures) produces these proteins near the time it attaches to the uterus. Daily sampling allows for the determination of the day of conceptus attachment.

In most cases, conceptus attachment, signaled by the initial increase in PAGs, occurred on day 20 or 21 post-AI. Novel findings from our laboratory indicated that cows experiencing delayed conceptus attachment (≥ 22 days post-AI) have a 50% chance, or more, of pregnancy loss (Figure 1).

Recent data suggests that pregnancy rates may be as high as 80% in first-lactation cows and 65% in multiparous dairy cows at the time of conceptus attachment when using fertility programs. However, pregnancy rates at the first pregnancy diagnosis around day 35 post-AI are much lower due to a significant number of pregnancy losses occurring between conceptus attachment and the first diagnosis.

Understanding the underlying causes of these losses in dairy cows is essential for developing effective preventive strategies. Our research aims to identify these causes and provide insight for actionable interventions to significantly reduce these losses. By addressing these challenges, we aim to enhance fertility of dairy herds.

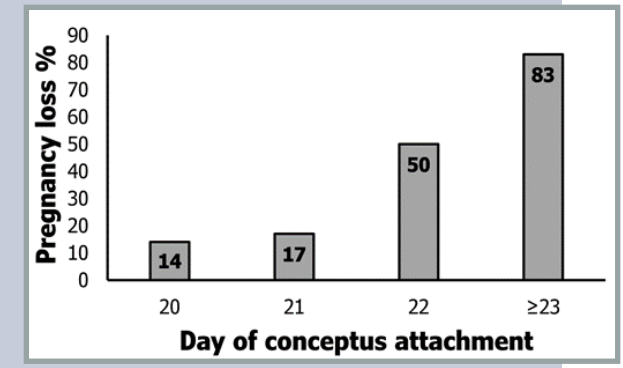


Figure 1. Impact of day of conceptus attachment on pregnancy loss in lactating cows. The day of conceptus attachment was defined as the 1st day of increase in PAGs post-AI.

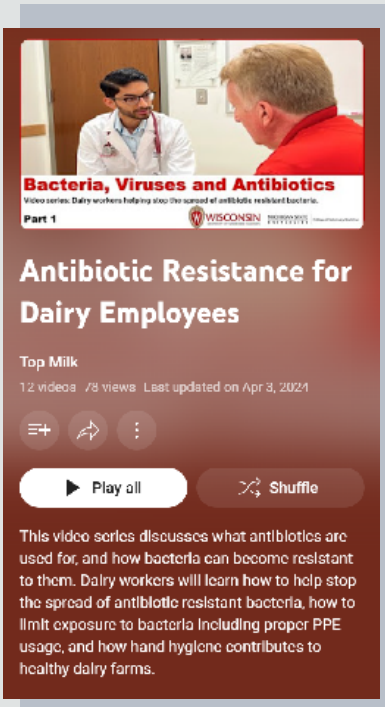
By J. Richard Pursley

View full article here

New bilingual video series aims to reduce the spread of antibiotic resistant bacteria

Dairy workers play a critical role in helping to decrease the spread of antibiotic resistant bacteria on farms. A new six-part video series, available in English and Spanish, covers topics including understanding farm pathogens, how antibiotic resistance affects animal and human health, personal protective equipment, and best practices for workers to follow. In total, the six videos are 30 minutes long.

In collaboration with the University of Wisconsin-Madison Farm Safety Lab, the Antibiotic Stewardship Lab in the College of Veterinary Medicine developed these videos as a training tool for dairy workers. The employees who directly interact with cattle every day are at the highest risk for contacting pathogens present on dairy farms. By taking simple steps to reduce the spread of bacteria, these employees can prevent animals and people from contracting bacterial infections. This results in fewer antibiotics, and a decreased chance of bacteria becoming resistant to antibiotics.



The Antibiotic Stewardship lab promotes evidence-based antibiotic usage for improved animal health. Lab members conduct and communicate research that helps dairy farmers maintain healthy cattle in a way that is both economically profitable and socially responsible. By developing and implementing practical strategies, they help farmers prevent infections bacterial diseases that may require antibiotic treatment.

Other lab resources include over 90 videos relating to antibiotic usage available on YouTube at the TopMilkQuality channel, and an antibiotic usage benchmarking tool for dairy farmers at topmilk.msu.edu.

By Pamela Ruegg

Management Tips

MSU Dairy Extension Team

Quinn Kolar

Advances in understanding Gram-positive mastitis on farms

Mastitis remains the most common and costly disease in the dairy industry, and most cases are treated with intramammary antibiotics. Mastitis is caused by a diverse group of pathogens, with about 25% of all mastitis cases caused by “Gram-positive” bacteria. For those who may not have taken microbiology recently, Gram-positive means that the cell wall of the bacteria is thicker and comprised primarily of a thick peptidoglycan cell wall. The cell wall is where many antibiotics attach to bacteria. Most antibiotics approved to treat mastitis are designed to be effective against Gram-positive bacteria.

There has been a lot of interest in different ways to reduce both antibiotic usage and the costs of treatment of non-severe cases of mastitis. Selective treatment for non-severe mastitis has been used for more than twenty years. It usually means that antibiotics are used to treat cases caused by Gram-positive bacteria but are not given to cases caused by Gram-negative bacteria or those that are culture negative when detected. In our recent study we compared the treatments used for Gram-positive cases of mastitis on commercial dairy farms.

On farm culturing of pathogens is an important tool to determine the causal organism of a mastitis infection. Photo by Pam Ruegg.

Thanks to funding from the Michigan Alliance for Animal Agriculture (MAAA) we conducted a study to compare three intramammary treatments (3 days of PolyMast®, 3 days of Spectrmast LC®, 8 days of Spectramast LC®) to a negative control (animals that received no treatment).

Thanks to our supportive farm partners, research was conducted on three commercial farms in Michigan and one farm in Minnesota. After a cow experienced a non-severe case of clinical mastitis her milk was cultured. If the case was Gram-positive, the cow was randomly assigned to one of the three antibiotic treatments or a negative control. Two milk samples were collected at case detection. The first milk sample was collected for immediate on-farm culturing and somatic cell count. The second milk sample was frozen and cultured at a Michigan State University laboratory.

Despite all these cases being called “Gram-positive” on farm, there are actually a highly diverse group of pathogens (Figure 1). The effectiveness of approved antibiotics for many of these bacteria is either unknown or not well understood. This diversity of pathogens is likely why we did not see any differences between the rates of bacteriological cure between the treatments and negative control.

There were several cow-level risk factors that affected bacteriological cure. The probability of a case achieving bacteriological cure was much lower for older cows and cows with history of sub-clinical mastitis (high SCC) before the clinical case was detected. Based on this research we recommend that both the cow’s history and culture results should be reviewed before making a decision to use antibiotics.

By Quinn Kolar

Dr. Quinn Kolar is a senior lecturer in dairy herd management at Cornell University. She graduated from MSU with a Ph.D in Animal Science in 2023.

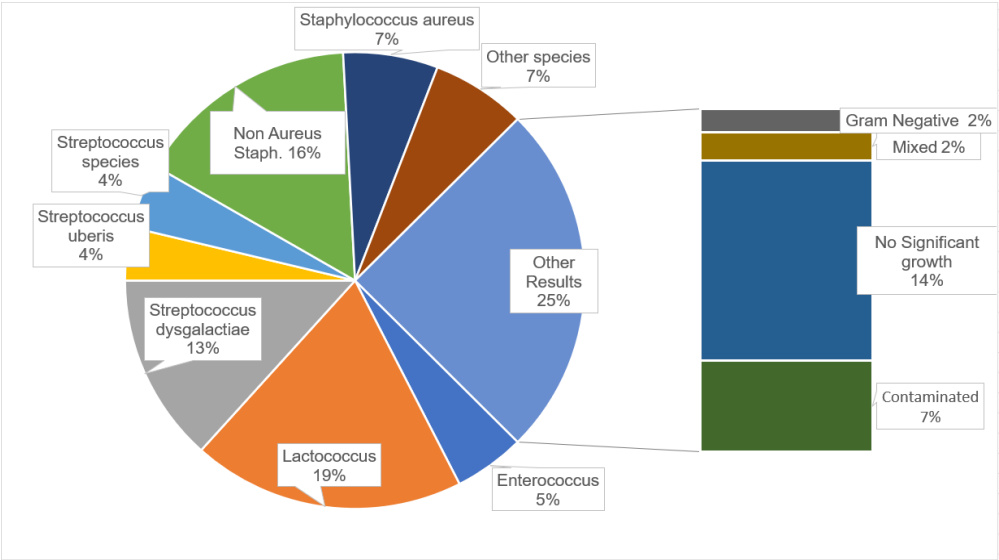


Figure 1. *Bacteria identified when culturing the duplicate milk sample.*

Research Drill Down: HPAI

Hear from Extension educators

Farm biosecurity can help protect your herd

Protecting your herd from disease and illness is always important. With recent outbreaks of Highly Pathogenic Avian Influenza (HPAI), cattle farmers should have a heightened awareness of symptomatic cattle and continue to engage in biosecurity practices on the farm. Producers should work closely with their herd veterinarian if they observe clinical signs of illness and to enhance the biosecurity of their operation.

Early identification of sick cattle is essential to minimize the spread of disease amongst individual animals and across herds. If these signs are observed in cattle, producers should immediately communicate with their herd veterinarian.

Signs of HPAI

- Reduced feed intake
- Decreased rumen motility
- Reduced milk production
- Abnormal, tacky, or loose manure
- Low-grade fever
- Thicker, concentrated, colostrum-like milk that may be yellow to brown in color

When sick cows are suspected

- Isolate, segregate, and reduce points of direct contact between well and sick animals
- Notify your herd veterinarian. They may recommend sampling or confirmatory testing
- Reduce human exposure to suspected sick animals
- Wear goggles, a mask, and gloves
  - Avoid contact between hands and face while working with sick animals
  - Wash hands after contact with suspected sick cattle, including their saliva, mucous, or manure
  - Remove PPE and soiled clothing before contact with healthy cows

TIP: Remove this sheet and post it in a visible location on your farm.

By Cora Okkema, Jerad Jaborek, Phil Durst, and Zelmar Rodriguez

View full article here

Farm biosecurity

In response to this outbreak, farms should complete a thorough review of their farm's biosecurity practices that focus both on cattle and human health and safety. Proactive implementation of biosecurity measures could reduce the negative economic impact of an HPAI outbreak in your herd. These include:

- Teach employees the both clinical signs of HPAI and who to notify if they suspect the diesase
- Milk and care for sick animals last, disinfect all handling and care equipment afterward
- Isolate new animals for two weeks and monitor their health before mixing them with the existing herd
- Know the health history of herds from which new animals are purchased. This includes obtaining a certificate of veterinary inspection for interstate transport
- Disinfect trucks and trailers after transporting cattle
- Minimize interaction with rodents and wild birds by removing food sources, covering waste, and adding wildlife deterrents
- Limit farm visitors, and provide all visitors with boot covers or a disinfecting area

Employee Biosecurity

- Do not drink raw milk
- Use dedicated footwear for the farm and disinfect it after use
- Wear clean clothes and shoes to the farm that have not come into contact with other livestock
- Wash hands, especially before eating and after handing suspected sick animals
- Limit entry to the farm and avoid traveling to multi-ple farm sites without changing clothes and boots
- Monitor employees for the following, which can be symptoms of HPAI:
  - Fever over 100°F, or feeling feverish with chills
  - Sore throat, with or without a cough
  - Difficulty breathing and shortness of breath
  - Eye tearing, redness, or irritation
  - Runny or stuffy nose

New Research on HPAI

Hear from the College of Agriculture and Natural Resources

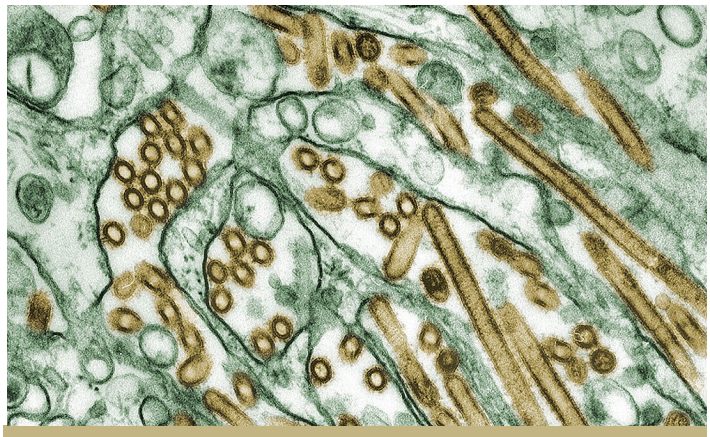
New research from Michigan State University will study the effects of a recent highly pathogenic avian influenza A virus (H5N1) outbreak on dairy cattle reproduction and milk production, as well as transmission of the disease and ways to mitigate it.

Support for the new project has been provided through two sources, each covering half of the $168,000 total:

- Annual capacity funding though MSU AgBioResearch, which is obtained from the USDA National Institute of Food and Agriculture.
- Capacity funding through the Michigan Alliance for Animal Agriculture (MAAA), a partnership of MSU, Michigan animal agriculture industries, and the Michigan Department of Agriculture and Rural Development (MDARD).

The project is co-led by Catalina Picasso, Zelmar Rodriguez and Annette O'Connor, faculty members in the College of Veterinary Medicine's Department of Large Animal Clinical Sciences (LCS). Picasso is a veterinarian and epidemiologist, specializing in transboundary infectious diseases in both livestock and wildlife animal populations. Rodriguez is a dairy health epidemiologist and dairy extension faculty member. O'Connor is a world-renowned veterinarian and expert in the application of quantitative epidemiology to improve policy on food safety, animal health and welfare, and veterinary practices.

According to the USDA, as of mid-May, H5N1 infections have been detected in dozens of dairy herds. The virus, which was first detected in domestic birds in the U.S. in 2022 but not until recently in cattle, has been identified in unpasteurized milk, as well as swabs and tissue samples from sick cattle.



Colorized transmission electron micrograph of Avian Influenza A HN1 (gold) grown in MDCK cells (green). Photo by Cynthia Goldsmith.

"Immediately upon the onset of the H5N1 outbreak in Michigan dairy cattle, MSU AgBioResearch, the College of Veterinary Medicine and MDARD began conversations about research questions that when answered could inform policy and management strategies to help prevent transmission within and across dairy herds," said James Averill, assistant director of MSU AgBioResearch and leader of the organization's animal agriculture initiatives. "This research will enable the dairy industry to better understand H5N1 and the impacts on dairy herds over time."

The research team will seek to answer several key questions, such as:

- **Impact:** What are the short- and long-term effects of the disease on reproduction and milk production?
- **At the herd level:** What factors influence the likelihood of herds becoming infected?
- **At the cow level:** What increases or decreases the likelihood of cows becoming infected?
- **Transmission:** How is the virus spreading within and between herds?

"There's still an enormous amount of information we don't know," O'Connor said. "This outbreak underscored the critical need to understand the dynamics, impact and prevention of H5N1 among the cattle population. We are fortunate to be able to ground this research in on-farm studies, working closely with MDARD to access farms that have had herds test positive for the virus."

The team plans to conduct five studies on farms with H5N1-positive animals. They will study lactating cows, dry cows and calves, collecting blood, nasal swabs and milk samples to be tested. All H5N1 testing is being performed by the MSU Veterinary Diagnostic Laboratory, the only laboratory in Michigan approved by the USDA to test for highly pathogenic avian influenza in any species.

Additionally, researchers will examine milking equipment for H5N1 presence and compare testing accuracy between pooled and individual samples. Data from Michigan farms will be combined with findings from other universities nationwide for a comprehensive analysis.

By Cameron Rudolph

View full article here

Hear from the researchers

What does it mean to approach an outbreak from an epidemiological perspective?

As veterinary epidemiologists, the researchers describe the steps of the epidemiological outbreak investigation of inflenza A virus in cattle that is underway.

1 Confirm the outbreak and the causative agent. In early March, veterinarians in Texas noticed unusual disease symptoms in dairy cows. Among the symptoms observed, one distinctive and abnormal finding was milk with a thicker consistency and a yellow to brown color, resembling colostrum. This was a very specific and unlikely symptom, as no known mastitis pathogen causes such changes without additional udder inflammation symptoms. Furthermore, mastitis pathogens were not identified in these cases. As the disease occurred in more cows and herds, concerns grew. After extensive testing, the USDA National Veterinary Services Laboratory identified HPAI in the samples and, therefore, a possible cause. Additional cases and confirmatory testing supported this suspicion. Soon after, the CDC confirmed the first and human H5N1 infection associated with this outbreak. Identifying the microorganism helped develop hypotheses about how infection is occurring and define control measures.

2 Form an investigation team. Michigan is a very strong dairy-producing state, and the well-integrated network of stakeholders has greatly facilitated communication and collaboration. Within MSU, the College of Veterinary Medicine, Extension, Veterinary Diagnostic Laboratory, and AgBioResearch have been working closely with MDARD and milk producers. This collaborative effort is focused on collecting the data needed to provide information and guidance to dairy producers and advisors on implementing preventive and control measures.

3 Introduce preliminary control measures. As outbreaks evolve and new information about the disease emerges, federal and state agencies typically issue orders to control the spread of the disease. In the current HPAI outbreak, this includes the USDA's order to test lactating cattle moving interstate and MDARD's order to implement biosecurity measures such as record keeping and designated visitor areas on dairy farms. Additionally, the USDA announced financial assistance for producers with affected herds to improve on-site biosecurity.

4 Perform epidemiologic studies. Understanding the dynamics of the disease is crucial for making informed decisions. During outbreak investigations, one of the most common approaches is case-control studies. In these studies, animals that test positive for HPAI are considered cases and are compared with healthy animals with similar characteristics, known as matched controls. Analyzing the differences between these two groups can provide valuable insights into the disease.

Drs. Annette O'Connor (top left), Catalina Picasso (top right), and Zelmar Rodriguez (bottom) are working together to study HPAI in dairy cattle.

We aim to understand how the disease is transmitted within and across dairy herds and how long the virus circulates in cows and the herd. Additionally, we seek to determine the best strategies to prevent herds from becoming positive and control the disease once it is on the farm. To do that, we visit farms for a few weeks and take samples from animals and the environment. Answering these questions is essential to inform farmers and policymakers about effective management strategies to prevent and control the spread and impact of the virus. In addition, other universities are conducting additional studies to better understand the disease, complementing our efforts.

5 Develop new control measures and/or update existing ones. As more science-based information is generated and the disease evolves, control measures are adjusted accordingly until they can be safely removed. For instance, if there is reasonable certainty that the virus spreads in a specific way, resources and biosecurity efforts may focus on that mode of transmission. This targeted approach ensures that the most effective strategies are employed to control the outbreak.

We are now entering the fourth step of the outbreak investigation, which means there is still more to learn and accomplish. Once all these steps have been achieved, the disease will enter a stage of surveillance and evaluation of control measures. While much remains unknown, implementing biosecurity measures and conducting frequent testing is the logical approach to eventually reaching a stage where we understand this virus better and provide specific advice tailored to the epidemiology of the virus. We are heading in the right direction, but not there just yet.

Producers who are willing to support the MSU research project are encouraged to contact the authors to learn more. All information collected will be confidential and anonymized.

By Zelmar Rodriguez, Annette O'Connor, and Catalina Picasso
View full article here

Hear from a dairy farmer

What happens in a dairy herd with HPAI? What should I expect if my herd became infected? This case report describes what one farmer has faced since herd infection began.

May 1, 2024 marked day one of the onset of an outbreak of HPAI on a dairy farm in Michigan. The farmer, recognizing the potential benefit to other farmers, willingly shared this information and agreed to have official testing of his herd. This report is what was known and reported on day 15 of the HPAI infection in a herd of approximately 500 lactating cows. Prior to infection, the average cow production on this farm ranged from 95 to 100 lbs. per day.

Initial symptoms were detected with the SmaXtec monitoring boluses present in about 90% of lactating cows. The onset was manifested by a spike in body temperature of 4 to 5 degrees above normal, followed by a decrease in rumination 6 hours later. The decrease of rumination in infected cows was severe with almost no activity occurring.

The temperature elevation lasted about two days, and there was a sharp drop in water intake by infected cows from 40-50 gallons to 5–10 gallons per day. These conditions resulted in severe dehydration in cows. The farm took an aggressive approach to supportive therapy, administering aspirin boluses twice a day to reduce temperature and inflammation. Additionally they provided Vitamin B and a rumen yeast capsule for a minimum of three days. For cows that refused to drink, they administered hypertonic saline IV. They tried IV Banamine on a limited number of cows but did not see any positive impact. Their goal is to make the cows as comfortable as possible.

It began in a barn with two pens of cattle that had three water fountains, the center one being shared. They wanted to try to confine the disease to a single group or at least a single barn. They changed their wash cycle in milking so that it washed after this group of cows. Regardless of their efforts, HPAI spread to all groups of lactating cattle on the farm.

For the first nine days, milk production per cow only decreased by about 5 lbs. and the farm was optimistic they had beaten back the disease. However, by day 12 cows were producing 21 lbs. less than average, accompanied by a doubling of somatic cell count to 180,000 c/ml. Cows were dehydrated with sunken eyes. Day 15 was the first day that the monitoring report showed fewer cows affected than the day before. Based on the number of cows with elevated temperatures and subtracting out the normal rate, they believe 40% of the lactating herd was infected.

The number of cows the farm employees needed to handle in some way had increased sixfold, making the work very labor intensive. Breeding stopped during this time because of the demands of just working with sick cattle.

While pregnancy checks have not at this point shown a reduction in conception, multiple late-lactation (150-220-day) cows have aborted their calves, and the farm believes this is due to high body temperatures. The disease primarily affected high-producing, multi-lactation cows and the low group. Transition cows seem to be performing normally at this point. Waste milk is pasteurized before feeding it to calves, and to date, the calves seem to be doing fine.

Employees have stayed healthy to date. The farmer encouraged them to wash their hands frequently and avoid touching their face and eyes. All employees were offered safety eyewear or face shields.

By day 15, the full impact of the disease has not yet been felt. However, the farmer did some cost estimations. He has spent $5,000 – $7,500 in extra medical supplies. Even though the costs of these common medications are low, the volume needed has been quite high. There has been the loss of milk, loss of quality premium, increased labor and loss of a few pregnancies resulting in culling animals. He estimates the cost for this herd of approximately 500 cows at $30,000 – $40,000.

By day 24, the farmer said that some cows—approximately 10% that became infected—have not recovered rumen activity. It is likely that these cows will be culled because they are not regaining weight and health. It appears that there are some individual cows that have a “long” form of the disease.

The owner of the farm in this case report understands that this does not include the potential longer-term costs. Another farmer said that some herds are seeing symptoms for four to six weeks. Additional negative impacts include increased culls of animals that do not recover significantly and increased weight gain of late lactation cows that recover feed intake but not milk output.

“It has been a lot of work, stressful on the cows and frankly overwhelming,” the farmer said. He shared that the monitoring system they have in place has enabled them to get a head start on supporting the health of infected cattle that show milk loss which begins two days after temperature elevation is detected. Therefore, they initiated therapy before milk loss occurred. The monitoring has also enabled him to evaluate the impact of supportive therapy and recovery by animals.

This farmer reported the disease to the Michigan Department of Agriculture and Rural Development (MDARD). He believes it is important for the industry to understand the disease. He knows that his is not the only farm to get HPAI and hopes that the more we can learn from his experience, the better we can prevent more herd infections, reduce the impact and potentially be better prepared against other diseases.

By Phil Durst
View full article here

Michigan Dairy Recognition

Shining a light on industry leaders

William Thatcher Receives 2024 CANR Outstanding Alumni Award

Dr. William Thatcher was recognized at the CANR awards program in March with the Outstanding Alumni Award. This award honors alumni who have obtained the highest level of professional accomplishments and who posess the highest standards of integrity and character.

After earning his Ph.D. in Animal Science from MSU in 1968, he spent his career at the Universty of Florida. As one of the world's leading authorities on bovine reproduction, he developed timed artificial insemination technologies that are widely used today.

Dr. Thatcher has published over 430 peer-reviewed articles, authored 55 book chapters, and has over 51,000 citations in other publications. He has advised or served on the committee for over 170 students, who now work in academia or the dairy industry in 30 different countries.

By Alex Dardas
View full article here

Melissa Gerharter is the New CEO of UDIM

Melissa Gerharter became the CEO of the United Dairy Industry of Michigan (UDIM) in January. She first joined the organization eight years ago, working in sports nutrition marketing and health and wellness. She later served as the chief operating officer and interim CEO.

In a statement relased by UDIM, Melissa spoke about her new role, stating, "I deeply believe in the value of dairy and love UDIM's commitment to sharing dairy's vital role in healthy diets with consumers. As I've learned about the passion and dedication Michigan dairy farmers have for their farms, animals, families, and communities, I've become hooked on helping tell the story of dairy on their behalf."

In the upcoming months, she is focused on supporting the UDIM team to build consumer trust in dairy foods, foster cooperation among stakeholders to maximize profitability, and elevate team efforts.

Adapted from a Michigan Farm News article published on 1/31/2024

Cameron Cook Named a 2024 Young Farmer Employee Finalist

Cameron Cook was one of four finalists in the Michigan Farm Bureau Young Agriculture Employee Award. She works as a chattel appraiser for GreenStone Farm Credit Serices and specializes in dairy, row crops, blueberries and nurseries. When she isn't at her day job, Cameron helps her parents with their dairy farm. They grow 650 acres of row crops, milk 300 cows, and raise their own replacement calves.

As the winner of the World Dairy Expo's national 4-H dairy judging contest, she understands the value of working with young people and guiding them in their chosen career. She says, "I find joy working with youth in developing life skills, teaching them about dairy and ag in general- giving them the same opportunities I was given, that helped make me who I am today."

Adapted from a Michigan Farm News article published on 4/9/2024

MICHIGAN STATE UNIVERSITY | Extension

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Mark your calendar

- Field Crops Virtual Breakfast
  April - September (Every Thursday)
- Michigan Dairy Expo and
  Michigan 4-H Youth Dairy Days
  East Lansing, MI - July 15-19
- Emergency Response to Accidents Involving Livestoc (ERAIL) Training
  East Lansing, MI - October 12
- MSU Dairy Education Academy
  Fall 2024
- MSU Dairy Tailgate
  MSU vs. Indiana
  November 2

Want to connect with your local dairy extension educator? Find them here: