Dutch Meadows Dairy Named 2025 MSU Dairy Farm of the Year

Tony Jandernoa recognized

Photo credit: Mikayla Bowen

This issue's cows are from the MSU Dairy Cattle Teaching and Research Center

Want us to feature your cows (or farm cat)?

Email ANS.SDN@msu.edu

Table of Contents

Sign up for the email newsletter here:

Sign up for the print newsletter here:

f Dairy at MSU

X @DairyMSU

in Dairy at MSU

Dairy Farm of the Year

Tony Jandernoa of Dutch Meadows Dairy LLC

The Michigan State University (MSU) Department of Animal Science named Tony Jandernoa of Dutch Meadows Dairy LLC in St. Johns as the recipient of the 2025 Dairy Farm of the Year.

Presented annually, this award is the highest honor the department gives to outstanding dairy farms across Michigan. Since its inception in 1958, the MSU Dairy Farm of the Year Award has celebrated exceptional farm management and leadership, with recipients representing the pinnacle of excellence in Michigan's dairy industry. Jandernoa is a first-generation dairy farmer who has demonstrated a commitment to advancing dairy farming practices and strengthening the Michigan dairy industry. He owns and operates Dutch Meadows Dairy LLC, established in 1987, and Meadowbrook Dairy LLC, built in 2016.

Over the past five years, the Jandernoa family has grown the business by acquiring a third dairy farm, Berlyn Acres, in Fowler, in late 2022. This purchase enabled them to increase the milking herd by 2,000 cows and expand the land base significantly. The family now manage 6,000 milking cows across three facilities with 3,200 youngstock. The establishment spans 4,000 acres where they grow corn, alfalfa, sorghum and triticale, maintaining production metrics that exceed Michigan state averages.

As a respected figure in the dairy industry, Jandernoa is known for his leadership and dedication to the operation. His role involves facilitating the development and implementation of large-scale projects, managing cropping practices and overseeing the financial aspect of the business.

Throughout the years, Jandernoa has emphasized the integration of innovative, sustainable farming practices, positioning his farm as a leader in environmental responsibility and farm management. He was an early adopter of sand lanes to separate sand from manure, helping manage manure and positioning the farm for expansion opportunities. He shared his experience with the sand lanes at a previous Great Lakes Manure Expo and through various industry articles while assisting other dairy producers in designing similar systems.

Meadowbrook Dairy is set to begin operating anaerobic digesters and gas upgrading equipment in early 2025, further enhancing the farm's commitment to sustainability and efficiency. These advancements will generate renewable natural gas to replace fossil fuels in the transportation sector and power the facility with clean energy.

Jandernoa's ability to combine cutting-edge technology with a deep respect for the land exemplifies his forward-thinking approach to dairy farming. Beyond his farm's operational success, Jandernoa has taken on numerous leadership roles that showcase his dedication to the broader dairy industry. As Vice Chairman of the Michigan Milk Producers Association (MMPA) and Chair of the Farmer Sustainability Advisory Committee, Jandernoa has played a pivotal role in shaping industry policy, advocating for sustainability and ensuring the long-term success of Michigan's dairy farmers. His participation in the MMPA Outstanding Young Cooperators program in 2002 further demonstrates his dedication.

Tony and Patti Jandernoa own Dutch Meadows Dairy LLC in St Johns, Michigan.

Jandernoa and his wife, Patti, are also deeply committed to agricultural education and community engagement. In 2009, they hosted the inaugural MSU Breakfast on the Farm, showcasing the

Dairy Farmer of the Year

importance of Michigan's agricultural heritage. Their additional involvement in the Alta Advantage Showcase Tour, MSU Extension research studies and willingness to host high school and university groups for educational visits reflect their commitment to sharing knowledge while supporting the next generation of dairy farmers.

In addition to the MSU Dairy Farm of the Year Award, Jandernoa's accolades include the Michigan Farmers Master Farmer Award, the Farm Bureau Philanthropy Award and numerous MMPA Quality Awards.

Tony Jandernoa walks in his field with his grandsons.

"The MSU Dairy Farm of the Year Award recognizes dairy farmers who exhibit outstanding management of their dairy farm business and provide exceptional leadership in the Michigan Dairy Industry," said Dr. Pamela Ruegg, the David J. Ellis Chair in Antimicrobial Resistance in the College of Veterinary Medicine. "Tony Jandernoa fully meets these criteria and truly deserves this award. Over 37 years, he has built a multi-generational team that has effectively grown, and outstanding management is evident as the cows are highly productive, healthy and produce high quality milk. Congratulations to Tony and his team for their accomplishments."

"Tony Jandernoa is an industry leader in implementation of new technologies especially related to manure management and sustainable farming practices," said Cathy Ernst, chair of the MSU Animal Science department. "We appreciate his willingness to host 4-H youth and MSU students, as well as his collaboration for conducting on-farm research trials at their farm. We are pleased to recognize Tony Jandernoa as the 2025 Dairy Farm of the Year." The award will be presented at the MSU Dairy Industry Celebration and Recognition Banquet on April 24, 2025.

By Sierra Jezuit
CANR Communications Manager

JOIN US FOR THE

MICHIGAN DAIRY INDUSTRY CELEBRATION AND RECOGNITION BANQUET

April 24, 2025• 5:00pm

BROOKSHIRE INN AND GOLF CLUB
205 WEST CHURCH ST.
WILLIAMSTON, MI 48895

PURCHASE TICKETS TODAY!

JOIN US TO CELEBRATE:

MICHIGAN DAIRY FARM OF THE YEAR

MSU DAIRY CLUB

MICHIGAN DAIRY MEMORIAL SCHOLARSHIP FOUNDATION

MSU DAIRY JUDGING

MSU DAIRY CHALLENGE

KEYNOTE SPEAKER: MICHIGAN STATE REPRESENTATIVE JERRY NEYER

CONTACT
LYNN OLTHOF (OLTHOFLY@MSU.EDU)
JOE DOMECQ (DOMECQ@MSU.EDU)

Dairy Spotlight

Pedro Trinidade and Augusto Madureira

Pedro Trinidade
Assistant Professor

Dr. Pedro Trindade joined the MSU College of Veterinary Medicine in 2024 as an assistant professor of Large Animal Clinical Sciences. He is focused on optimizing farm animal welfare and overcoming health challenges by combining behavioral, physiological, and machine learning approaches.

More specifically, he works to optimize acute pain measurements across farm animals using algorithms and devices to improve the prediction ability and automate data collection. Dr. Trindade is a collaborative research enthusiast and has built a solid international network to advance animals' quality of life. To date, he has published 56 peer-reviewed publications.

Some of his recent work includes a study on post surgical pain in catt;e. The researchers found that statistical modeling was an effective tool in monitoring pain when used with an abridged scoring system. This can help farm employees save time while supporting animal welfare.

Before joining MSU, he was a postdoctoral researcher at North Carolina State University and Sao Paulo State University in Brazil. Dr. Trindade has an MBA in Data Science and Analytics, a Ph.D. in Animal Biotechnology, and an M.S. in Animal Science, all from Sao Paulo State University, Brazil. He also has a degree in Veterinary Medicine from Rio Preto University in Brazil. As a graduate student, he completed an international internship in the Swedish University of Agricultural Sciences.

Augusto Madureira
Assistant Professor

Dr. Madureira's journey into animal science began in São Paulo, Brazil, where he was raised with a deep appreciation for animals. He pursued a degree in Animal Science at São Paulo State University in Botucatu, a decision that laid the foundation for his career.

During his master's at Sao Paulo State University and Ph.D. at the University of British Columbia, he specialized in bovine reproduction, focusing on estrus detection technologies. His studies demonstrated the role of technology in enhancing fertility and reducing pregnancy losses. This experience solidified his passion for precision livestock farming and the use of data-driven solutions in animal production.

At Michigan State University, Dr. Madureira's work integrates research, teaching, and extension to address critical challenges in dairy cattle production. His primary research goal is to improve reproductive efficiency, animal welfare, and production sustainability through innovative technologies such as activity sensors. He strives to support producers by implementing practical strategies for disease detection, reproductive management, and herd optimization, ensuring economic viability and environmental stewardship.

Dr. Madureira is eager to collaborate with producers interested in improving transition cow health and fertility outcomes through the use of automated activity monitors. He is also happy to assist with on-farm visits and can be reached at madurei2@msu.edu.

News and Updates

Students compete in academic quadrathalon

Each year, the Animal Science department offers MSU undergraduate students enrolled in any major the opportunity to participate in the American Society of Animal Science Academic Quadrathlon (AQ). AQ requires a four-person team that completes four events:

• A written exam, consisting of questions from any area related to animal production and products

• An oral presentation, in which the team uses cooperative problem solving and critical thinking to develop a presentation within a one hour time limit

• Quiz Bowl, which is similar to the 4-H quiz bowl in which teams go head-to-head answering questions related to animal agriculture

• A lab practicum, where teams work through 15-minute stations to demonstrate practical skills

The winning MSU team moves forward to compete against other universities in the ASAS Midwest Section. Two teams competed in this year's competition. Team one consisted of Kassandra Wilson, Delani Stull, Layla True, and Mylee Haught. Team two consisted of Laken DuRussel, Brooke DuRussel, Grace Brown, and Helen Craig.

The written exam focused on the topics of genetics, nutrition, anatomy, and physiology. The oral presentation and quiz bowl took place at the Animal Science department meeting in November. For the oral presentation, teams had to answer the prompt, '*Will precision livestock technologies replace animal husbandry staff in disease detection in production livestock?*' The presentations were judged by Drs. Babatope Akinyemi, Pedro Trindade, and Barry Bradford. Finally, the laboratory practicum took place on December 12th and consisted of stations testing teams' knowledge in meat science, equine, sheep, dairy, beef, swine, poultry, companion/exotic animals, feedstuffs, and anatomy.

Several Animal Science department faculty, staff, and students were instrumental in making this event a success. Drs. Mike VandeHaar, Hanne Hoffmann, Tasia Kendrick, and Miriam Weber provided the written exams. Drs. Jackie Jacobs, Cara Robison, and Andrea Garmyn as well as Kendra VanOrder, Julie Moore, Erika Ekhardt, Melanie Pimental Concepcion, Katie Baugh, and Eye Ampaiwan assisted in designing and running the laboratory practicum stations.

While it was a very close competition up until the very end, Kassandra Wilson, Delani Stull, Layla True, and Mylee Haught will represent MSU at the 2025 ASAS Midwest Section Meeting, held March 9-12 in Omaha, NE. Congratulations to the team, and we look forward to next year's MSU Animal Science AQ competition!

From left to right: Students test their meat science knowledge. Students work through a feedstuff station. Students identify tools used in dog handling. Photo credits: Julie Moore and Dr. Andrea Garmyn

By Andrea Luttman
Animal Science graduate student and Academic Quadrathalon coordinator

News and Updates

Consider the economics of your antibiotic usage

Reducing antibiotic usage isn't as simple as "just using less" without specific protocols, safeguards for animal health, and clear goals. Farmers may consider implementing selective dry cow therapy (SDCT) on their farms to reduce antibiotic usage.

Jaimie Strickland (top) and Pamela Ruegg (bottom)

What is it? Many farms use blanket dry cow therapy (BDCT), the practice of treating all cows at dry off (the end of milking) with antibiotics in each quarter along with teat sealant. While this practice allows farm employees to treat all cows identically, it can contribute to greater antibiotic usage and increased costs, especially when not all cows need antibiotic treatment. Selective dry cow therapy uses the cow's past and current infection status to determine if antibiotics are needed at dry off or if only teat sealant is sufficient.

Selective dry cow therapy may be right for your farm if you have...

- A bulk tank somatic cell count below 250,000 cells/mL
- Few cases of contagious mastitis caused by *Staph aureus* and *Strep agalactiae*
- Records of the number and duration of mastitis cases per cow during the last lactation
- Few mastitis infections during early lactation, which typically originate during the dry period
- The ability to use teat sealant on all cows at dry off

Cows are generally eligible for SDCT if they have not had clinical mastitis in the last two weeks of lactation, and if they had one or no cases of clinical mastitis during the entire lactation period. Typically, younger cows in their first lactation are more likely to meet these criteria than older cows. Farmers may consider implementing SDCT only in first lactation animals as they evaluate if the practice benefits their operation.

Can I save money? The TopMilk team hosts the Antibiotic Usage Benchmark Tool, a secure online program that allows farms to enter their electronic treatment records and learn how their antibiotic usage compares to that of other farms. An exciting new feature shows the farm's current cost of dry cow therapy and estimates of costs savings if the farm treated fewer cows. In the example below, a farm currently spends $1721 on dry cow therapy per year for 132 cows. If the farm only treated half of those cows in the following year, they would decrease their costs by half and could save $861 just on the cost of antibiotics! The farm could realize additional savings from decreased labor and supply costs as well.

Want to learn more? You can input your treatment records at dairyantibioticbenchmark.msu.edu. The whole process takes about an hour. Want additional support? Email cvm.benchmarkhelp@msu.edu to set up an appointment with a TopMilk team member for personalized assistance.

ByJaimie Strickland and Pamela Ruegg
Postdoctoral Research Associate and
Professor, College of Veterinary Medicine
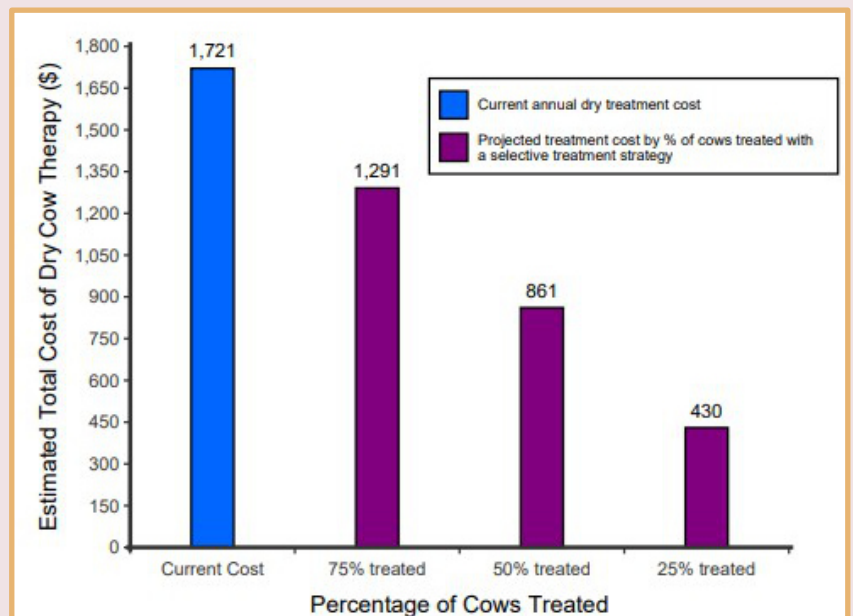
News and Updates

Tri-State Field Day showcases precision technology

The 2024 Tri-State Dairy Nutrition Field Day was held in at Bridgewater Dairy in Montpelier, Ohio. This year's program spotlighted data-driven management, precision livestock technologies, and the integration of artificial intelligence in dairy farm research. Modern dairy farms generate thousands of data points daily, capturing metrics such as letdown times, milking weights, milk flow, rumination times, activity, lying time, and more. Effectively managing and interpreting this data has become a critical aspect of running a successful dairy operation.

A key theme repeated throughout the presentations was the importance of high-quality record keeping and accurate data entry. Without reliable input, making informed decisions based on herd insights becomes a challenge. Researchers are leveraging machine learning, artificial intelligence, and advanced data analysis tools to predict health events in animals, including calving, lameness, and respiratory diseases.

Tri-State Dairy Nutrition field day participants in front of Bridgewater Dairy, Montpelier Ohio. Photo credit: Cora Okkema

The integration of innovative tools, such as cameras, offers the potential to track animals from birth to maturity, creating a visual record of their growth and condition over time. Wearable and internal sensors, scales, feeding systems, milking parlors and sort gates, and ventilation technologies are further enhancing the ability to collect comprehensive individual animal data. These advancements allow for a more accurate and holistic understanding of each animal, reducing reliance on guesswork.

Dr. Miel Hostens of Cornell University summarized the role of new technologies on dairy farms, stating "artificial intelligence could revolutionize the dairy industry by enhancing animal welfare through early disease detection, improving farm productivity with predicative modeling and data integration, and advancing research in digital dairy management."

We are truly in an era where the possibilities for data and technology in dairy farming feel limitless. These tools are becoming indispensable for management teams, transforming how decisions are made and enabling more precise and effective farm operations.

Besides the field day, the Tri-State Dairy Nutrition Conference is held annually in Fort Wayne, Indiana over three days. The conference focuses on advancing new research in dairy nutrition. Learn more about the conference at tristatedairy.org, or scan the QR code to register.

By Cora Okkema
MSU Extension Dairy Educator

2025 TRI-STATE DAIRY NUTRITION CONFERENCE

April 14-16, 2025

Fort Wayne, Indiana

A collaborative conference hosted by:

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

MICHIGAN STATE UNIVERSITY

PURDUE UNIVERSITY

CONFERENCE EVENTS:

- STUDENT PRESENTATION SHOWCASE WITH FINANCIAL AWARDS
- UNDERGRADUATE PROGRAM INCLUDING A DAIRY FARM TOUR, GUEST SPEAKERS, AND SOCIAL EVENTS
- EXHIBIT HALL
- 2 DAYS OF PRESENTATIONS
- NETWORKING OPPORTUNITIES

2025 Dairy Programs

I
am
a
SPART**AN**
of
Michigan's
Dairy
Industry

The MSU Extension dairy team has a commitment to enhance the **competitive advantage** of Michigan dairy producers and Michigan's dairy industry. We do this by:

• Conducting research and demonstrations directly with dairy producers

• Visiting farms to apply research-based information and concepts tailored to each unique operation

• Holding educational programs throughout the state focusing on issues relevant to the industry

• Creating and sharing educational resources through our website, social media, news releases, and emails

MSU DAIRY TEAM ON-FARM EVALUATIONS

All dairy evaluations and trainings are...

Available on request

Customizable to your farm's protocols

Offered in English or Spanish

Easy to schedule- contact an educator!

- **Parlor Performance** combines digital vacuum recorders (VaDia) and other metrics to analyze milking protocols and parlor efficiency. Educators provide recommendations to address issues such as bimodal milking and poor milk quality. Data can also be used to tailor milker-training programs for the participating farms.

- **Feeding Managemen**t evaluations focus on 6 core areas: efficiency, mixing, production, shrink, hygiene, and safety. A detailed report of findings and recommendations for improvement is provided. Focus areas also include pushup routine, mixing procedure, and equipment evaluation. The feeder's training and consulting program often follow up on this assessment.

- **Heat Stress** will thoroughly evaluate the farm heat stress abatement strategies. The evaluations include wind speed mapping, barn temperature, THI measurement, and other indicators of heat stress. A detailed report of findings and recommendations for improvement is provided to the farm.

- **Passive Transfer of Immunity in Calves** assesses serum total protein levels, to evaluate the effectiveness of your colostrum management and provides critical insights into your calves' immunity status. We supply a recordkeeping tool designed to help your calf care team track and analyze results, enabling data-driven decisions to optimize colostrum and calf care practices, reducing the risk of future illnesses.

MSU DAIRY TEAM ON-FARM EMPLOYEE TRAININGS

- **Stockmanship** training will cover general stockmanship and animal handling. This training meets the requirements of the National Dairy FARM program.

- **Down Cow Management** will teach farm staff about the care of down cows and why these cases should be treated as emergencies.

- **Calf Care** will instruct dairy farm employees in basics of calf care, along with new management practices and research to grow calves to their full potential.

- **Dehorning with Pain Mitigation** is an interactive training which covers the use of a hot iron dehorner and caustic paste, as well as the proper medication administration techniques for pain management in calves.

- **Maternity** training covers critical points around calving, including the care of the cow and newborn, colostrum management, and calving difficulties.

- **Feeder** training goes over the do's and don'ts for a dairy feeder and focuses on explaining the why of feeder tasks and SOPs.

- **Hands-On Euthanasia** uses portable models and a captive bolt stunner to teach placement and protocols for proper euthanasia.

- **Farm Team Communication** reviews the concepts of active listening, effective communication, and conflict approach to improve communication on dairy teams, between colleagues, and with supervisors.

DIGITAL PROGRAMS

- **Heifer Academy** features Extension Educator Cora Okkema disucssing various topics on heifer management. There are twelve videos available, each about an hour long. Watch at YouTube.com/@DairyMSU or search for Heifer Academy on Spotify. Contact Cora Okkema to suggest a topic.

- **Virtual Coffee Break with the MSU Dairy Team** covers a wide variety of dairy topics, new episodes are released in the spring and fall. Each episode features a dairy extension educator and a guest expert. Episodes are available on Apple Podcasts and Spotify. Contact Martin Mangual to suggest a topic.

- **Field Crops Virtual Breakfast Series** are weekly online seminars featuring field crops educators during the growing season. This weekly series for farmers and agribusinesses focuses on a wide array of relevant field crops pest and crop management topics. The series is flexible, fluid, and able to adapt when issues arise due to unforeseen growing conditions. The series runs from March to September on Thursdays at 7AM. Register at canr.msu.edu/dairy/events. Contact Phil Katz with questions

- **Managing Farm Stress** provides resources for agricultural professionals, including teletherapy, farm management and financial resources, and stress management strategies. Visit canr.msu.edu/managing_farm_stress or contact Remington Rice.

- **FaceFarmLive!** is a short video series program about farm issues or procedure improvements relevant to dairy farmers. Videos are posted to the Facebook Groups West Michigan Dairy Farmers and Thumb Dairy Group. Contact Martin Mangual for assistance joining these groups.

- **MI Ag Ideas to Grow With** runs from February 24th to March 7th, and features webinars on animal agriculture, field crops, farm finances, and water management. Several seminars offer RUP and/or CCA credit. Register at canr.msu.edu/miagideas. Contact Betsy Braid at braidbet@msu.edu for assistance registering.

Go to canr.msu.edu/dairy/events for a complete program listing

IN-PERSON PROGRAMS

- **AgrAbility** provides free assistance to people in the agricultural industry who have an injury, illness, or physical disability to enable them to continue working. Staff provide personalized recommendations for assistive technologies and equipment modification, as well as bilingual on-site pain and arthritis screening. Visit michiganagrability.org or contact Sam Wolfe to schedule.

- **Artisan Cheese Workshop** is a three-day class on the art and science of cheesemaking, taught by internationally acclaimed cheesemakers from Leelanau cheese at the MSU Dairy plant in East Lansing. Participants will make six cheeses. Contact Phil Durst or go to canr.msu.edu/dairy/events to register.

- **Breakfast on the Farm** is a series of consumer events where farms open to visitors. Attendees will learn how farmers care for animals, protect the environment, and produce safe and nutritious food. Visit breakfastonthefarm.com to learn when events will occur between June and September 2025.

- **Crisis Preparedness Planning** is a partnership between MSU Extension and the United Dairy Industry of Michigan. Participants will develop an in-depth crisis preparedness plan in response to risks that can impact farm operation continuity. Contact Cora Okkema or Phil Durst to learn more.

- **On-Farm Compost Field Day** will demonstrate large scale composing in a farm setting, including demonstrations and discussions in August 2025. Contact Eliza Hensel, compost systems educator, at Hensele1@msu.edu

4-H PROGRAMS

- **Michigan 4-H Dairy Conference** is a two-day opportunity for 12 to 19 year old's to learn about the Michigan dairy industry on March 1st and 2nd.

- **State 4-H Dairy Quiz Bowl Contest** will take place on June 28th, featuring written and oral questions on dairy topics

- **Michigan 4-H Dairy Days** will occur in East Lansing from July 14th to 17th. It includes management and judging contests, as well as showmanship and a celebration picnic.

- **National 4-H Dairy Conference** in Madison, Wisconsin, is an opportunity for youth to visit the World Dairy Expo and learn about the global dairy industry from September 28th to October 2nd.

Contact Kendra Van Order for additional information

Dairy Contacts

Extension Dairy Advisory Team

The MSU Extension Dairy Advisory Team is a group of progressive dairy producers and professionals selected to provide input on need in the industry and feedback on MSU Extension activities. Members serve two-year terms and meet regularly by phone and in person twice per year.

Miguel Acevedo	Husbaldo	Kendra Kissane	Jennifer Roberts
Andrew Arens	Dominguez	Randi McCosh	Sarina Sharp
Nathan Brearley	Josh Garver	Evelyn Okkema	Carla Wardin
Carrie Ceh	Jim Good	Haylee Reisinger	

MSU Extension Dairy Educators

NAME	LOCATION	PHONE	EMAIL*
Paola Bacigalupo	Mason	517-279-6419	paolabs
Phil Durst	West Branch	989-387-5346	durstp
Martin Mangual	West Olive	616-994-4581	carrasq1
Cora Okkema	Big Rapids	231-592-9493	okkemaco
Frank Wardynski	Ontonagon	906-884-4386	wardynsk

MSU Extension Educators Serving Dairy Producers

NAME	EXPERTISE	PHONE	EMAIL*
Chris Bardenhagen	Farm Management	231-866-1959	bardenh1
Cheri Burk	Farm Management	989-985-4026	burkcher
Corey Clark	Farm Management	517- 420-2042	clarkcr
Florencia Colella	Farm Management	231-224-6439	colellaf
M. Charles Gould	Bioenergy	616-834-2812	gouldm
Phil Kaatz	Forages	810-338-5242	kaatz
Jon LaPorte	Farm Management	269-414-6418	laportej
Sam Wolfe	ArgAbility	231-882-0025	wolfesa4
Remington Rice	Farm Stress	231-882-0026	riceremi

MSU Extension Dairy Specialists

NAME	EXPERTISE	PHONE	EMAIL*
Angel Abuelo	Animal Health	517-884-7818	abeulo
Barry Bradford	Nutrition	517-432-5400	bjbrad
Kim Cassida	Forages	304-575-6099	cassida
Adam Lock	Nutrition	517-353-8714	allock
Pamela Ruegg	Antimicrobial Stewardship	517-355-8384	plruegg
Richard Pursley	Reproduction	517-281-7289	pursleyr
Augusto Madureira	Precision Technologies	517-353-5102	madurei2
Zelmar Rodriguez	Milk Quality	612-261-9797	zelmar01

*All email addresses end in @msu.edu

Our Sponsors

United Dairy Industry of Michigan	Wirth and Fedewa
Caledonia Farm Elevator	Nobis Agri Science
Cornerstone Ag Management	Michigan Dairy Tech
SE AG Solutions	Corteva Pioneer

Management tips

New opportunities to supplement fatty acids to early lactation cows

Jair Parales Giron (top) and Adam Lock (bottom)

The immediate postpartum period represents a significant metabolic challenge for high-producing dairy cows. During this time, cows experience reduced feed intake alongside increased energy requirements for milk production, leading to negative energy balance. To compensate, cows mobilize body energy reserves to obtain enough energy for milk production, but excessive mobilization can lead to metabolic disorders and poor production performance. Thus, increasing the energy intake in the immediate postpartum is critical to minimizing the severity of negative energy balance and enhancing animal performance.

We can increase the energy density of the postpartum cow's diet by increasing dietary starch or adding fatty acid (FA) supplements, and oilseeds like whole cotton seed (WCS). When using starch, choose sources with low rumen fermentability to prevent negative effects on the cow's ability to take in nutrients and synthesize milk fats. When using fatty acid supplements, consider what types of fatty acids to include (such as palmitic acid, or PA, and oleic acid, or OA), their proportion to each other, and proportion of the total diet. For WCS, consider the dietary inclusion level. Past research from Dr. Adam Lock's lab shows that blends of PA to OA at 60 to 70% to 20 to 30% respectively improve milk production response in early lactation when fed between 1.5% and 2% of diet dry matter.


Fatty acid supplementation in low starch vs high starch diets

Low starch (LS): 22% diet dry matter (DM) was starch
Low starch with FA (LSFA): 22% diet DM was starch, 2% of diet DM was a 70% PA and 20% OA supplement
High starch (HS): 28% of diet DM was starch
High starch with FA (HSFA): 28% of diet DM was starch, 2% of diet DM was a 70% PA and 20% OA supplement

Adding fatty acids to a low starch diet increased milk fat and 3.5% fat-corrected milk yield. Fatty acid supplementation did not increase these variables when combined with a high starch diet.
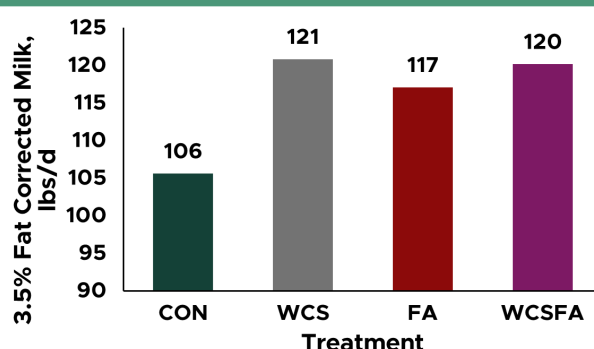
Combining high starch and a FA supplement may negatively impact ruminal fermentation, reducing available nutrients for milk fat synthesis and increasing the rumen production of specific fatty acids known to reduce milk fat synthesis in the mammary gland. Check the diet's starch content before supplementing with fatty acids to early-lactation cows.
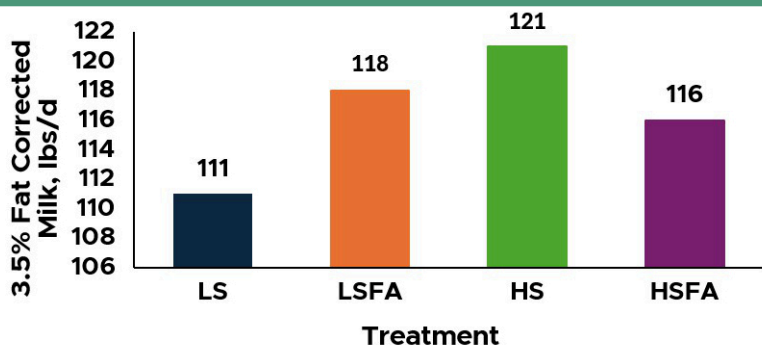
Fatty acid supplementation from whole cotton seeds or supplemental fat

Control (CON): A diet without WCS or supplemental FA
Whole cotton seed (WCS): 10% of diet DM was WCS
Fatty acids (FA): 1.5% of diet DM was a 60% PA and 30% OA supplement
WCS with FA (WCSFA): 10% of diet DM was WCS and 1.5% of diet DM was a 60% PA and 30% OA supplement

Adding WCS or FA to the diet increased milk fat and 3.5% fat-corrected milk yield compared to the control diet. However, feeding both resulted in a large increase in dietary FA, which may have negatively impacted nutrient digestibility, resulting in no further improvement compared to feeding them individually. Feeding WCS or FA is a good strategy to improve animal performance in early-lactation cows.

(Bar chart: 3.5% Fat Corrected Milk, lbs/d by Treatment — LS: 111, LSFA: 118, HS: 121, HSFA: 116)

(Bar chart: 3.5% Fat Corrected Milk, lbs/d by Treatment — CON: 106, WCS: 121, FA: 117, WCSFA: 120)

By Jair Parales Giron and Adam Lock
Graduate student and professor, Animal Science department

Research drill down

Unlocking the key to reproductive success in lactating dairy cows:

Dairy farming is an intricate balance of maximizing milk production, maintaining animal health, and ensuring long-term herd sustainability. At the heart of this balance lies cow reproduction, particularly the challenge of minimizing pregnancy losses after artificial insemination (AI).

Much of our previous work focused on improving fertility programs to enhance pregnancy rates and AI outcomes in lactating dairy cows. Our laboratory recently discovered that while approximately 90% of dairy cows become pregnant after AI, only about 49% remain pregnant 62 days post-AI, even following a fertility program. This points to a staggering early pregnancy loss, especially in multiparous (second or more lactation) cows, and worse if bred following a detected estrus.

Most of these losses occur before a 35-day pregnancy diagnosis. These unseen losses represent a major and previously unaccounted for challenge in dairy cattle management. Our current research is focused on identifying the causes of these early losses, with the goal of developing strategies to help save many of these pregnancies and reduce the impact they have on dairy production. While fertility programs like Double Ovsynch and G6G have significantly improved AI success rates, pregnancy loss remains a critical issue.

Farm profit increases when a greater percentage of the herd is in peak milk. For this to occur, greater control of calving interval with optimal reproduction is critical. Cow health and daily herd average milk production can be optimized when a high percentage of cows become pregnant and remain pregnant before 130 days in milk (DIM). Fewer cows calve with excessive body condition loss when this happens. Body condition loss following calving is highly associated with postpartum health problems, a key component of the High Fertility Cycle (Figure 1).

Pregnancy losses create havoc with calving intervals because most cows have an extended time to their next estrus. If not detected in estrus

these cows will likely be detected at first pregnancy diagnosis. But, if pregnancy losses occur after first pregnancy diagnosis, the chances of keeping these cows in a high fertility cycle become unlikely.

First key finding: Detecting early pregnancy

The first step in gaining a greater understanding of the extent of pregnancy losses in lactating dairy cows was to determine pregnancy near the time of conceptus attachment to the uterus, about 20 days post-AI. Before this, nearly all pregnancy loss data was based on the first pregnancy diagnosis around day 35 post-AI. Recent studies utilized two blood samples tested for pregnancy-specific protein B; PSPB, produced by the conceptus. The conceptus is made up of the embryo and the cells responsible for maternal/fetal interaction. An increase in PSPB indicates the conceptus has attached to the uterus. One blood sample was collected before the expected initial increase in PSPB and another after the increase had occurred to calculate the increase from baseline. We were 100% accurate in diagnosing pregnancy at this time (Figure 2). We now refer to this increase in PSPB as "conceptus attachment." Most cows that have conceptus attachment have this increase in PSPB around day 20 or 21 post-AI.
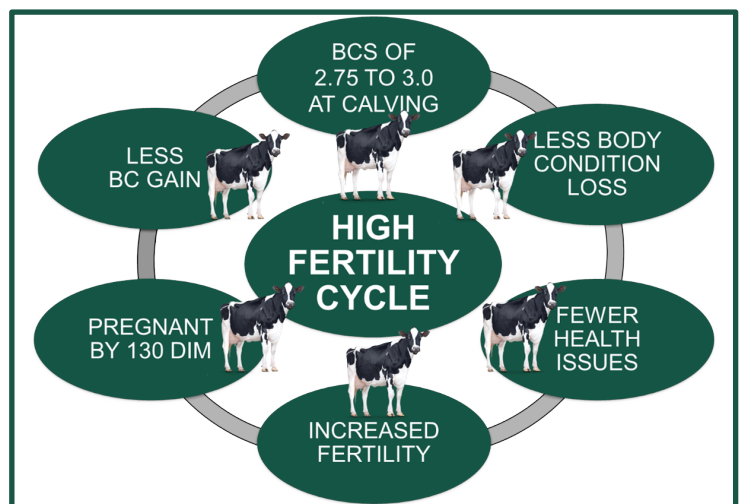

Figure 1. The high-fertility cycle: association between body condition score leading to cyclic patterns of fertility in the subsequent lactation.

Research drill down

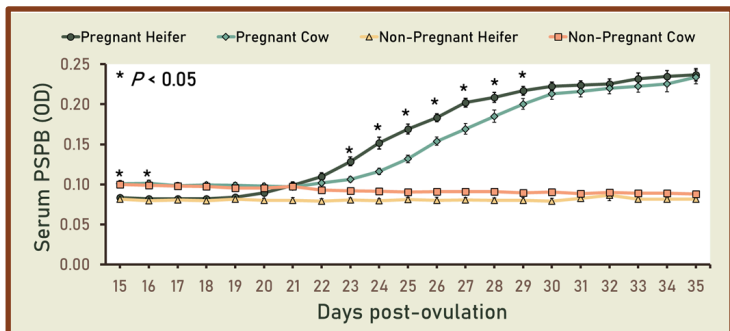## Drilling down on pregnancy losses to improve herd longevity and farm profitability

Figure 2. Average daily serum PSPB concentrations from day 15 to 35 post-ovulation for both pregnant and non-pregnant lactating Holstein cows (n = 56) and nulliparous Holstein heifers (n = 23).
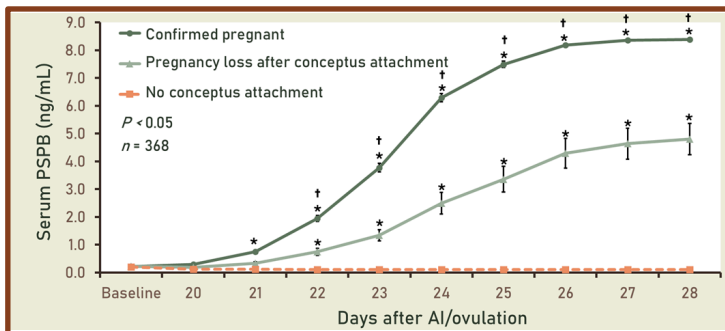

Figure 4. Mean serum concentrations of PSPB in cows with conceptus attachment that either maintained pregnancy or lost prior to day 35 post-AI, and in cows without conceptus attachment.

Second key finding:
Cows that have delayed time to conceptus attachment will likely have pregnancy loss

We found that cows can experience an initial rise in PSPB anytime between days 19 and 26 post-AI. The later this increase occurs, the greater the likelihood of pregnancy loss (Figure 3). This suggests either a developmental problem with the conceptus that occurs at the time of fertilization, a uterine issue, or a combination of both.
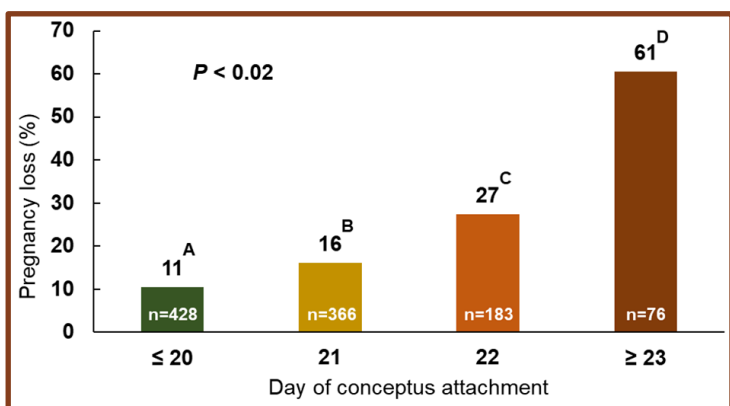

Figure 3. Relationship between day of conceptus attachment and pregnancy loss

A key indicator of this developmental problem is the reduced average concentrations of PSPB in cows that lose vs. maintain pregnancy (Figure 4). Multiparous cows are more likely to experience delayed attachment and subsequent pregnancy failure.

Third key finding:
The ratio of estrogen to progesterone in the dam's circulatory system prior to conception is a key indicator of embryonic survival

Our laboratory has demonstrated that pre-conception factors, such as the diameter of the ovulatory follicle and circulating concentrations of estrogen and progesterone before ovulation, can significantly impact subsequent pregnancy outcomes in cattle. These factors may influence the oocyte directly or affect the uterine environment during early embryonic development.

In a recent study we found that cows that maintained pregnancy had a two-fold greater estrogen to progesterone ratio in maternal circulation at the time of the final GnRH injection of the Double Ovsynch protocol, compared to cows that either did not become pregnant or lost pregnancies after conceptus attachment (Figure 5).

The antral age of the ovulatory follicle is also crucial for both embryonic development and pregnancy maintenance. Recent data from our laboratory suggest that a prolonged antral age of the ovulatory follicle reduces the likelihood of pregnancy and increases the risk of pregnancy loss. Cows with an extended antral age of the ovulatory follicle also had larger follicle diameters, which have been linked to reduced fertility outcomes.
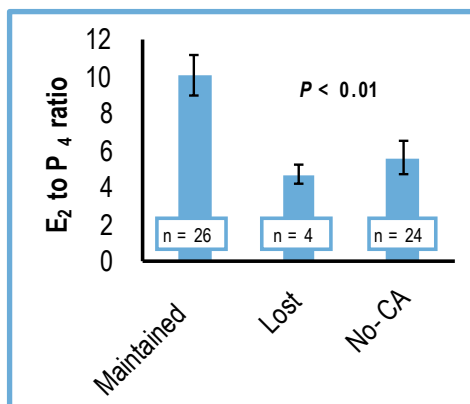
Research drill down

Figure 5. *Differences in the ratio of estrogen (E2) to progesterone (P4) in maternal circulation prior to AI in cows that maintained or lost pregnancies following conceptus attachment (CA) or did not have CA.*

Specifically, larger follicle diameter is associated with decreased pregnancy rates following artificial insemination (AI) and higher pregnancy losses. This is a particularly important concern in multiparous cows that undergo AI after estrus detection, as these cows typically have larger ovulatory follicles compared to those treated with fertility programs like Double Ovsynch. The unnecessary culling of multiparous dairy cows results in decreased herd average milk production, increased replacement costs, and diminished operational efficiency. Approximately 50 % of cows leave the herd before their third lactation.

In a recent comparison between the Double Ovsynch protocol and estrus detection using electronic monitoring for first AI, we observed that cows receiving the Double Ovsynch program had significantly greater pregnancy rates within the first three weeks following the voluntary waiting period. Notably, multiparous cows had a 260% greater chance of becoming pregnant during this period.

Our data suggest that careful timing is key to help reduce pregnancy losses in multiparous cows. These cows should ideally receive their first AI before 85 days in milk with the goal of a 50% pregnancy rate by the initial pregnancy diagnosis around 35 days post-AI. Early pregnancy in multiparous cows has far-reaching benefits beyond the immediate lactation, including reduced body condition loss at calving, lower incidences of postpartum health issues, and improved fertility during the next lactation. These cash cows represent the backbone of farm profitability.

Want to learn more about the Pursley Lab? Find them on YouTube, @pursleylabmsu5805 or visit dairycattlereproduction.com

Searching for ways to decrease pregnancy losses: Could increasing progesterone post-AI help solve this problem?

Previous data suggested that progesterone supplementation and level of progesterone post-AI could improve embryonic survival. We found that increasing progesterone levels post-AI had no significant impact on pregnancy success or loss rates. In fact, multiparous cows with greater progesterone concentrations experienced greater pregnancy loss rates compared to those with lower progesterone levels.

This counter intuitive finding suggests that progesterone supplementation may not be the silver bullet it was once considered. In fact, it raises the possibility that other factors—such as the timing of conceptus attachment or the general health of the reproductive tract—are more influential in pregnancy maintenance. These data highlight that other strategies may be needed to improve pregnancy outcomes rather than simply focusing on progesterone levels. This also indicates that a functional corpus luteum producing normal amounts of progesterone is sufficient for embryonic development prior to conceptus attachment.

The mission of the Pursley Lab is to advance the understanding of dairy cattle fertility and develop innovative reproductive strategies that enhance the profitability of dairy farms. We continue to investigate the underlying causes of pregnancy loss and develop new practical strategies to improve pregnancy survival in dairy cattle.

About the Authors:

Dr. J. Richard Pursley is a professor of Animal Science studying reproductive management of dairy cattle. His research focuses on increasing fertility in lactating dairy cows.
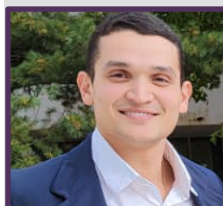
Alisson Santos is a PhD student in the Pursley Lab. After graduating, he intends to continue his efforts investigating fertility and early pregnancy losses in dairy cattle.

Michigan dairy recognition

Shining a light on industry leaders

Evergreen Farms earns National Dairy Quality Award

Kris and Carla Wardin own Evergreen Dairy in St Johns, MI, and are the sixth generation on the same land. They milk 600 cows and grow corn, alfalfa, and pasture grasses on 900 acres. They are also raising three boys – Ty, Cole, and Max.

Kris is on the board of directors of Michigan Milk Producers Association, United Dairy Industry of Michigan, and was recently reelected as the treasurer of the United Dairy Industry Association. Carla works in marketing and promotes dairy farming on social media as Truth or Dairy.

Thanks in part to their dedicated team members, Evergreen Dairy is a five-time National Dairy Quality Award winner, including the 2020 Platinum and the recently announced 2024 Gold.

Photo credit: Canfield Jenkins

Doug Chapin is Farmer Communicator of the Year

He's a dairy farmer, he's the Board Chairman of the Michigan Milk Producers Association (MMPA), and now he's the National Milk Producer Federation's Farmer Communicator of the Year.

This award recognizes a farmer's work in sharing the story of dairy, and celebrates those who go above and beyond to promote a comprehensive understanding of the challenges and opportunities dairy farmers face.

Speaking about the award, Chapin stated, "I don't take my leadership role lightly and I recognize how important it is to share our story and do my part to help people understand the work we do every day."

Photo Credit: Michigan State University

2016 graduate continues to support Michigan dairy industry

Thanks to her time at Michigan State University as an Animal Science major, her experience particiapting in Dairy Challenge, and and her time working on Michigan dairy farms, Brittni Tucker knew she wanted to give back to the industry that's held her interest since high school.

In her current role as an Advisory Product Specialist for DeLaval North America, Tucker helps dairy farms troubleshoot milk quality, improve cow performance, and and assist in farm management. She enjoys walking barns to watch the cows as well as analyzing software data to identify performance challenges.

Photo credit: Brittni Tucker

2265K Anthony Hall
474 S. Shaw Lane
East Lansing MI 48824

MICHIGAN STATE UNIVERSITY | Extension

Mark your calendar

- **MI Ag Ideas to Grow With**, **Online**

   February 24th to March 7th

- **Artisan Cheese Workshop**, **East Lansing**

   March 3rd through 5th

- **Western Dairy Management Conference**, **Reno NV**

   April 1st through 3rd

- **Tri-State Dairy Nutrition Conference**, **Fort Wayne IN**

   April 14th through 16th

- **Dairy Industry Celebration and Recognition Banquet, Williamston**

   April 24th

View a complete events listing at canr.msu.edu/dairy/events

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