2025 Annual Report

Reflecting activities from July 1, 2024 - June 30, 2025

Harnessing research and development for Wisconsin's dairy community.

WELCOME TO OUR FISCAL YEAR 2025 ANNUAL REPORT

On the cover: Zifan Wan, faculty at UW–Platteville, studies cold plasma technology to create safer, more sustainable solutions for dairy and agriculture. With support from the Dairy Innovation Hub, her lab is developing chemical-free tools to improve food safety, reduce environmental impact, and strengthen the future of farming. See story on p. 38. Photo by Andrew McNeill/UW–Platteville

Above: Karen Antunes, a Hub-funded PhD student in nutritional sciences at UW–Madison, presents her research using bovine colostrum to combat obesity at the Wisconsin State Capitol. Photo by Maria Woldt/ Dairy Innovation Hub

Back cover: Dairy Cattle Center manager Melanie Eck gives a walk-through of the facility's milking parlor during the Dairy Summit event at UW–Madison. Photo by Michael P. King/UW–Madison CALS

TABLE OF CONTENTS

Scan QR code to access the fully searchable "Project Showcase" database with information on all 260+ Hub-funded awards to date!

OUR STORY

The Dairy Innovation Hub was first imagined during an informal meeting at Mitch Breunig's Mystic Valley Dairy in Sauk City. After the initial concept was developed, dairy groups and passionate dairy leaders partnered with the Universities of Wisconsin to bring this idea to reality.

The concept was brought to the State's special Dairy Taskforce 2.0 in December of 2018 and was followed by introduction of legislation by Senator Howard Marklein and Representative Travis Tranel in May 2019. The following months included approval of a spending plan set to guide the Hub's efforts and funding became available to campuses in late 2019.

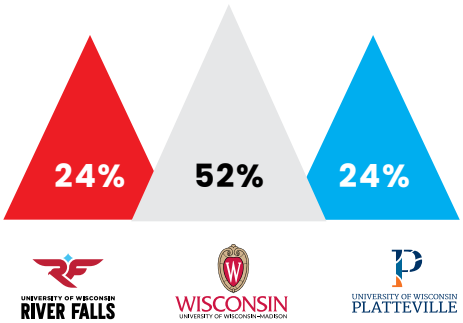
In six years, the Hub has created mechanisms to manage the investment, funded more than 260 proposals, and managed 23 faculty searches. The accomplishments listed herein are the result of data collected from funding recipients to track progress and accountability.

THE DAIRY INNOVATION HUB is supported by a $7.8M annual state investment to drive research and development across the UW–Madison, UW–Platteville, and UW–River Falls campuses, ensuring that Wisconsin's $52.8 billion dairy community remains a global pacesetter in producing nutritious dairy products. This is all accomplished with a keen focus on economic, environmental, and social sustainability.

STATE INVESTMENT

$7.8M

PER YEAR



HOW DID WE GET HERE?

Above: On March 26, 2025, the Hub hosted an informational research poster session at the State Capitol to highlight select projects funded by the initiative at UW-Madison, UW-Platteville, and UW-River Falls. Photo by Maria Woldt/Dairy Innovation Hub

HOW DID WE GET HERE?

DEC. 2018
Concept endorsed by Dairy Task Force 2.0

MAY 2019
Original legislation introduced by Sen. Marklein and Rep. Tranel

AUG. 2019
UW Board of Regents approves Hub spending plan

OCT. 2019
JFC releases funding

DEC. 2019
Funding available to campuses

JAN. 2020
First funding decisions made

MARCH 2020
Campuses cease in-person instruction due to COVID-19

AUG. 2020
First faculty start. In total 11 new faculty positions hired/in progress

FY 22
Campuses hold funding calls, hire faculty and report outcomes. On average, the Hub funds 50-70 proposals per year

NOV. 2021
Hub returns to in-person event format for Summit and Symposium

FY 23
Hub researchers report hundreds of students engaged, publications, and outreach meetings. Nearly $7M in related grants

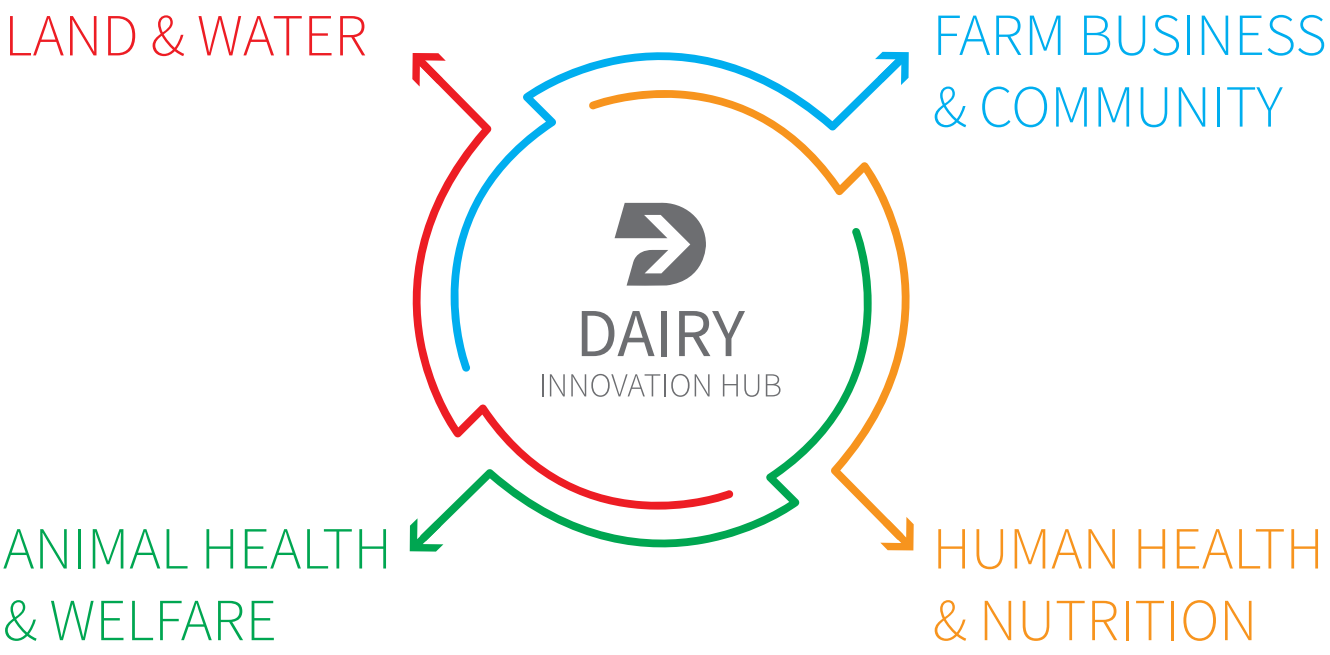
JULY 2023
200+ funding awards and 17 faculty searches to date. Research impact and student opportunities at all campusees

FY 24
230+ funding awards and 21 faculty searches to date. Research impacting farmers, program alumni contributing to ag workforce in Wisconsin

JULY 2025
260+ funding awards and 23 faculty hires to date. Impactful outreach events and tours showcasing examples of industry impact

CURRENT FY
In just six years, functioning at steady state. Regular calls for research proposals, graduate students and postdoctoral fellowships

FOUR KEY PRIORITY AREAS



Stewarding land and water resources
Improve nutrient management and soil health; reduce greenhouse gas emissions, improve air quality; develop alternative uses and markets for manure; investigate novel cropping systems; and minimize nutrient losses to lakes and rivers.

Enriching human health and nutrition
Develop value-added products to serve health needs and dietary trends; design food processing, packaging and delivery technologies to improve product quality and shelf-life; improve the safety of dairy foods; understand and address barriers and facilitators to dairy consumption.

Ensuring animal health and welfare
Develop data analytics for animal management; reduce metabolic disorders and infectious diseases; improve stress biology and immune function to support animal health and productivity; improve efficiency and sustainability; deploy genomic selection and other technologies for healthy animals.

Growing farm businesses and communities
Improve profitability and growth opportunities for businesses throughout the dairy economy and promote informed decision-making by consumers and policymakers; use big data to optimize dairy farms; develop skilled & tech-savvy rural workforce; improve financial literacy & return on assets.

THINKING GLOBALLY, ACTING LOCALLY

MISSION:

Position Wisconsin's dairy community for economic, environmental and social success by advancing science, developing talent and leveraging collaboration.

VISION:

To be the world's preeminent source of bold new discoveries and talent development in dairy.

CORE VALUES:

Awareness
We are grounded by the realities of the dairy community. We seek to be dialed-in to the needs and conditions of our stakeholders.

Learning and Discovery
We support scientific advancement and evidence-based decision-making. We want to be a platform for lifelong learning and action.

Collaboration
We actively contribute to university partners and stakeholders working together as a team. We acknowledge the power of relationships.

Respect
We embrace diverse perspectives, cultures, audiences and business philosophies. We treat everyone with dignity and respect.

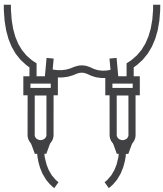
Accountability
We take the stewardship of resources seriously. We will take responsibility for the success or failures of our efforts.

Creativity
We encourage looking at common problems through a different lens. We will foster the spark of innovation and find answers to tomorrow's challenges.

WISCONSIN DAIRY STATS

5,200
DAIRY FARMS
(as of Sept 1, 2025)

more farms than
any other state



32.3
BILLION
pounds of milk
produced annually

1,269,000
COWS

That's almost half as many as 1950!

121K JOBS

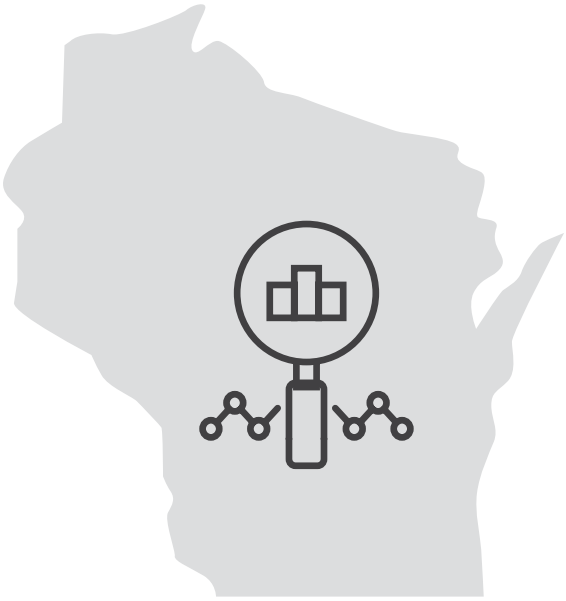
in Wisconsin are dairy farming
or processing related

EVERY

IN WISCONSIN GENERATES

$41,500

in economic activity per year.



1ST NATIONALLY
in cheese production

2ND NATIONALLY
in milk production

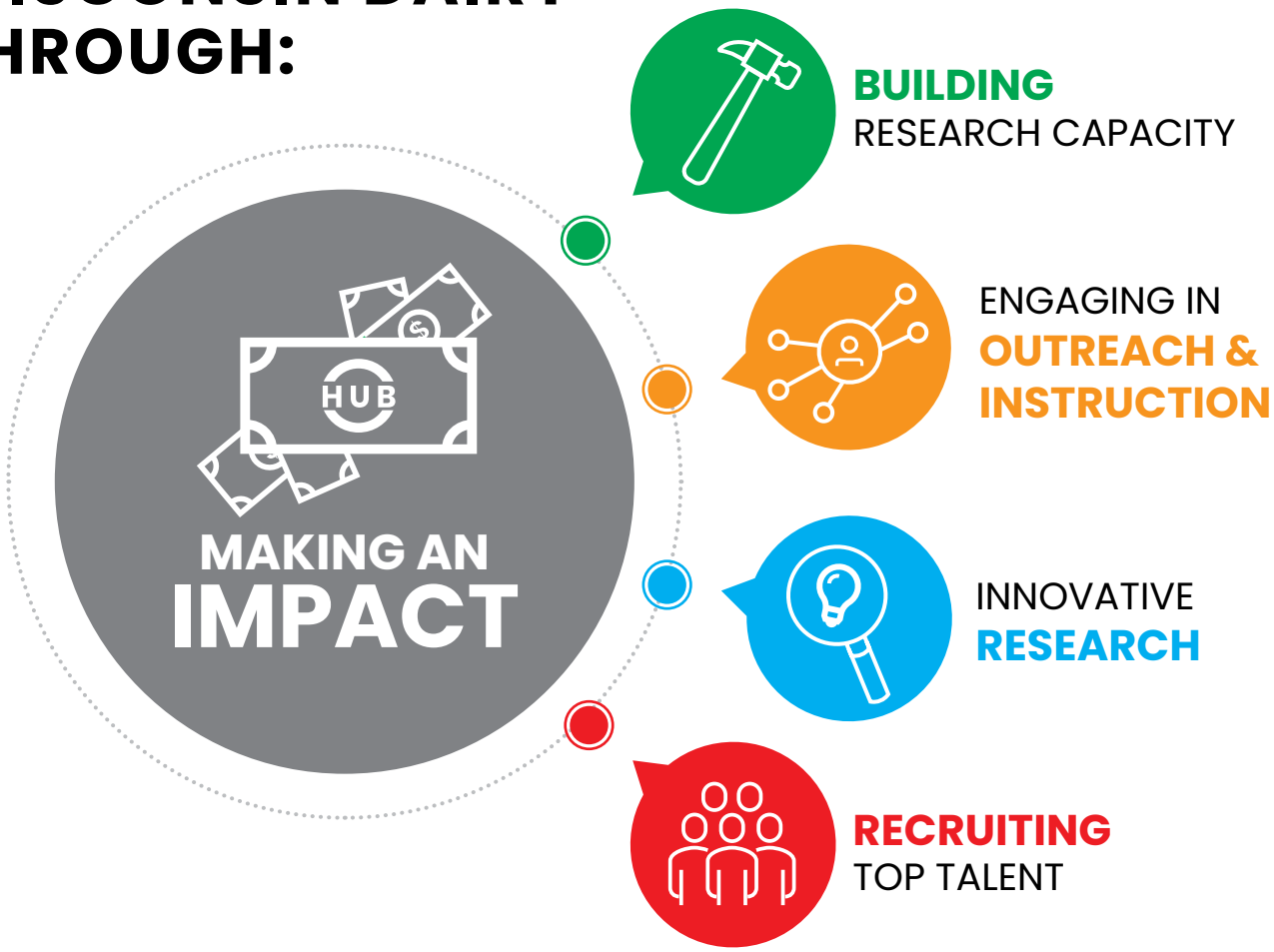
$52.8

BILLION

in economic activity to the state of Wisconsin

Sources: USDA NASS and Contribution of Agriculture to the Wisconsin Economy: An update for 2022 by Steven Deller & Jeffrey Hadacheck, UW-Madison.

HUB DOLLARS IMPACT WISCONSIN DAIRY THROUGH:



Why is research and training so important ?

- Develops tools and technologies to produce more milk with less cows, land and water
- Improves the quality of life for dairy animals and build consumer trust
- Ensures a safe, abundant and nutritious food supply for ALL people
- Recruit, train and retain talent to live and work in Wisconsin
- Strengthens dairy economy by developing new products and uses for milk
- Keeps Wisconsin dairy farms and businesses nationally competitive and rural communities strong

WHO BENEFITS
FROM THIS RESEARCH?

ACCOMPLISHMENTS

More than **260+**
PROJECTS FUNDED
across **3** campuses and **4** priority areas since 2020

23 Total
FACULTY SEARCHES
attracting top talent to Wisconsin

$3.7M
LEVERAGED GRANT FUNDS FROM FY 25

220
JOURNAL ARTICLES, ABSTRACTS, OR POSTERS
accepted or published in FY 25

310
STUDENTS
and trainees engaged in FY 25 Hub research & infrastructure

214
PRESENTATIONS
to live audiences in FY 25

OUR LEADERSHIP

Glenda Gillaspy

Dean, College of Agricultural and Life Sciences, UW–Madison

This year, UW–Madison was pleased to host two Hub events: the Dairy Summit in November and the Dairy Symposium in May. These annual events showcase the innovative research funded by the Hub. Students are critical to forwarding research projects at all three campuses, and graduate students play an especially important role in UW-Madison's Hub research.

During the 2024-25 academic year the Hub provided direct funding to 15 graduate students who have come to Madison from around the state and around the world because they want to contribute to discoveries to improve the dairy industry. A total of 65 students and post-doctoral trainees presented dairy research at the spring research Symposium. Those projects represented all four of the Hub's themes, and the research stems from nearly every discipline in the College of Agricultural and Life Sciences, and even those in the College of Engineering.

The Hub is certainly meeting the goal of attracting the best and brightest to Wisconsin to apply their creativity to solving challenges facing Wisconsin dairy farmers, processors and consumers. We are proud of the impressive students who pursue graduate studies at UW-Madison because of our outstanding faculty and our strong industry partnerships that allow for unique collaborations. The Hub provides additional opportunities for these top students and serves as an enhancement to the critical federal funds that have also historically been the backbone of UW-Madison's dairy research. We look forward to continuing to partner with the state and federal governments to serve the dairy industry.

Dean Glenda Gillaspy delivers opening remarks at the Dairy Summit, hosted by UW–Madison on Nov. 20, 2024. The Hub's largest summit to date brought together farmers, industry leaders, and elected officials, including Governor Tony Evers. Photo by Nguyen Tran/Dairy Innovation Hub

Carolyn Keller

Interim Dean, College of Business, Industry, Life Science and Agriculture, UW–Platteville

UW–Platteville has a strong tradition of impactful research at local, state, and global levels. This was evident at the recent Dairy Innovation Hub Symposium, where we showcased work on alfalfa feed quality, manure processing, water quality, and soil health. Our labs and farm remain active throughout the summer, with collaborative, interdisciplinary research happening daily.

Each summer, UW–Platteville hosts the Summer Undergraduate Scholars Program. Through a competitive process, 10 students and their faculty mentors are selected to conduct research, earn a certificate for emerging scholars, and present their findings to the community. These presentations often lead to regional conference appearances, Research on the Rotunda, and even publications.

I'm proud to share that four of this year's projects were Hub-sponsored. Special thanks to James Hampton, Raymond Pugh, and Raja Maunnamalai for mentoring these students, and congratulations to Carley Nehls, Connon Gresens, Landen Beaumont, and Riley Mohr for their outstanding work. The Hub's impact at UW–Platteville continues to grow—advancing science and inspiring the next generation of researchers and innovators.

Michael Orth

Dean, College of Agriculture, Food and Environmental Sciences, UW–River Falls

Now that I've settled into my role as Dean at UW–River Falls, I'm truly beginning to appreciate the value of the Hub. The collective efforts across campuses—guided by the Hub's advisory council—are showing real impact. This year, UW–Madison hosted both the Dairy Summit and Dairy Symposium, showcasing research from all participating campuses. Many of these projects involve cross-campus collaborations and span a range from applied to more foundational science. Together, they form a robust portfolio that will benefit the dairy community now and into the future. The engagement from legislators, industry leaders, and dairy farmers has been encouraging and continues to strengthen the Hub's impact.

On our campus, Bahareh Hassanpour and Jill Coleman-Wasik have been leading summer research on nutrient cycling and water quality. With recent NSF funding, they welcomed postdoctoral research fellow Rochelle Joie Saracanlao, who's been working closely with undergraduates to collect and analyze data. We take pride in offering students high-impact learning experiences, and Hub funding expands these opportunities while supporting research relevant to diverse dairy stakeholders.

We're also excited to welcome new faces to the Hub team. Azhar Uddin, assistant professor in agricultural economics, is exploring the feasibility of a Choice and Sensory Evaluation Lab. Bob Zeng, now with a joint appointment, is working on forage fractionation for improved nutrient efficiency. Sierra Howry became associate director and UW–River Falls liaison earlier this year, succeeding Steve Kelm, who now leads the Farm & Industry Short Course. We hope to see many of you this November at the Dairy Summit in River Falls!

OUR PARTNERS

Chad Zuleger

Executive Director | Dairy Business Association

"The Dairy Innovation Hub is one of the smartest investments Wisconsin has made in its dairy community. It brings together world-class researchers and real-world farmers to tackle the challenges and opportunities facing our industry. The Hub is helping ensure that Wisconsin remains a global leader in dairy for generations to come."

Shelly Mayer

Executive Director | Professional Dairy Producers

"The Dairy Innovation Hub is a powerhouse of progress, turning Wisconsin's bold investment into over 260 research projects that are elevating dairy from local fields to global frontiers. This is smart science in the service of farmers, food systems, and a future where dairy continues to lead in sustainability, innovation, and economic vitality."

Randy Romanski

Secretary | Wisconsin Department of Agriculture, Trade and Consumer Protection

Wisconsin is recognized worldwide as a dairy industry leader, and one of the ways the state maintains this position is by continuing to invest in research for the future. The Dairy Innovation Hub strategically leverages the state's investment to further its reach in the priority areas each year. Events such as the Dairy Summit and Dairy Symposium highlight the impressive research being done and foster collaboration across the universities and throughout the dairy industry.

Brad Olson

President | Wisconsin Farm Bureau Federation

At their core, farmers embody an innovative spirit. When that spirit is paired with top-of-the-line researchers and faculty mentors, the Dairy Innovation Hub builds unstoppable leaders in the dairy industry. The collaborative effort embodied by the Hub across our agricultural universities supports the dairy supply chain in its entirety, ensuring a sustainable community for farmers to remain successful.

John Umhoefer

Executive Director | Wisconsin Cheese Makers Association

The Hub has revitalized dairy innovation in Wisconsin, with crucial new research at Wisconsin's top three agricultural universities. It's the right time for this emphasis on applied research that helps dairy farms and dairy product manufacturers succeed today. Dairy is growing as Americans rediscover the true value of natural, nutritious foods like cheese, butter and whey proteins and Hub research is key to this bright future for Wisconsin.

FROM THE DIRECTOR

Matt Ruark
Faculty Director | Dairy Innovation Hub

As we reflect on the past year, it is with immense pride and gratitude that I share with you the progress we have made during fiscal year 2025. This year has been one of significant milestones, deepening collaborations, and research innovations that continue to shape the future of dairy in Wisconsin and beyond.

At the heart of the Dairy Innovation Hub's mission is the pursuit of sustainable and innovative solutions that address the most pressing challenges in the dairy community. We are driven by our commitment to enhancing productivity, improving environmental stewardship, and fostering economic resilience within dairy. Through our collective efforts, the Hub is not just advancing science; we are also providing tangible outcomes for dairy farmers and their communities.

As the new faculty director, I have had the privilege of working alongside dedicated faculty, industry leaders, and stakeholders, all united by our shared vision of a strong, sustainable dairy sector. Outside of the Hub, I am a professor and extension specialist in the Department of Soil and Environmental Sciences at UW–Madison, where my research centers on improving nitrogen and phosphorus fertilizer management across diverse Wisconsin agroecosystems—including grain, dairy, potato, and vegetable production systems—with the dual goals of enhancing agricultural productivity and protecting water quality.

This year, Hub researchers made strides in several key areas. From advancements in animal health and nutrition to technologies for farm management, the Hub's research continues to lead the way in optimizing dairy farm efficiency while minimizing environmental impact. Through a collaborative, interdisciplinary approach, researchers are tackling issues such as nutrient management, greenhouse gas reduction, and enhancing milk quality—all with the aim of ensuring the continued success of Wisconsin's dairy farmers.

A core element of the Hub's success is our ability to build strong partnerships within the dairy community and beyond. The collaboration between UW-Madison, UW-Platteville and UW-River Falls has proven to be a powerful model for addressing industry challenges from multiple angles. We are also fortunate to work closely with industry stakeholders, including dairy farmers, processors, and policymakers, to ensure that our research is practical and applicable to real-world needs.

This year, our outreach efforts have expanded significantly. Through multiple conferences, field days, and online platforms, we've shared Hub-funded research with a broader audience. Engaging directly with farmers allows us to receive valuable feedback, ensuring that our research remains relevant and impactful. Our outreach efforts have also emphasized education, helping the next generation of dairy professionals learn about the innovative tools and strategies being developed.

As we enter fiscal year 2026, we remain committed to strengthening Wisconsin's dairy community through science, talent development, and collaboration. With your support, the Dairy Innovation Hub will continue driving solutions to today's challenges and building a more sustainable, innovative future.

On Wisconsin!

"We are driven by our commitment to enhancing productivity, improving environmental stewardship, and fostering economic resilience within dairy"

ADVISORY COUNCIL

"We're grateful to have the continued support of the Legislature and the Governor for the Dairy Innovation Hub. This funding empowers our three agricultural colleges to elevate their research efforts—from virtual fencing and innovative cover crop mixtures that enhance soil health, to expanding the use of dairy products across all age groups through high-protein supplements. We're also exploring allergy-friendly and lactose-free options to broaden dairy's reach. And this is just the beginning."

Dave Daniels
Mighty Grand Dairy | Wisconsin Farm Bureau Federation | chairman

COUNCIL MEMBERS:

Mitch Breunig
Mystic Valley Dairy
Professional Dairy Producers

Tom Crave
Crave Brothers Farm
Dairy Business Association

Holly Dolliver
UW–River Falls

Sierra Howry
UW–River Falls

Jimena Laporta
UW–Madison

Shelly Mayer
Professional Dairy Producers

Tera Montgomery
UW–Platteville

Scott Rankin
UW–Madison

Randy Romanski
Department of Agriculture, Trade & Consumer Protection

Matt Ruark
faculty director (ex officio)

John Umhoefer
Wisconsin Cheese Makers Association

CAMPUS UPDATES

UW–Madison FY 25 accomplishments:

- Awarded six new graduate student assistantships. Provided ongoing funding for second graduate student fellowship cohort
- Onboarded three new assistant professors in the areas of adaptive cattle nutrition, soil carbon science, and translational plant science for dairy sustainability
- Provided ongoing funding for six postdoctoral fellowships selected in FY 24
- Developed and deployed a new call for trainees that allows researchers to hire a postdoctoral fellow or a graduate student
- Collaborative planning for 2024 Dairy Summit, held on the UW–Madison campus

FY 25 Steering committee:

Paul Fricke
Animal and Dairy Sciences

Sara Gragg
Animal and Dairy Sciences

Jingyi Huang
Soil and Environmental Sciences

Margaret Kalcic
Biological Systems Engineering

Jimena Laporta
Animal and Dairy Sciences

Paul Mitchell
Agricultural and Applied Economics

Beth Olson
Nutritional Sciences

Matt Ruark
Soil and Environmental Sciences

Heidi Zoerb
CALS External Relations

UW–Platteville FY 25 accomplishments:

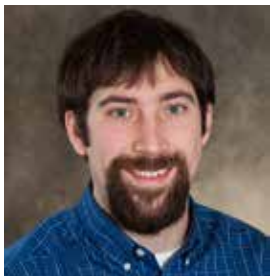
- Selected five new awards for faculty research fellowships; Provided ongoing funding for five projects selected in FY 24
- Selected five new awards for supplies and equipment
- Support for graduate student assistantship co-mentored with UW–Madison
- Recruited a new assistant professor in the area of agribusiness, entrepreneurship, and community development
- Planning for dairy faculty recruitment

FY 25 Steering committee:

Kevin Bernhardt
Agribusiness

Krista Hardyman
Animal, Dairy and Veterinary Sciences

Tera Montgomery
Animal, Dairy and Veterinary Sciences



Austin Polebitski
Civil and Environmental Engineering

Chuck Steiner
Pioneer Farm

CAMPUS UPDATES (continued)

UW–River Falls FY 25 accomplishments:

- Selected four new awards for faculty research fellowships; Provided ongoing funding for seven projects funded in FY 24
- Onboarded one new assistant professor in the area of agricultural economics
- Selected five new awards for supplies and equipment
- Ongoing support for graduate student assistantship co-mentored with UW–Madison
- Planning for faculty recruitment in the areas of dairy animal welfare and atmospheric science

FY 25 Steering committee

Brenda Boetel
Agricultural Economics

Holly Dolliver
Plant and Earth Science

Sierra Howry
Agricultural Economics

Steve Kelm
Animal and Food Science

Michael Orth
CAFES Dean

Joel Peterson
Agricultural Engineering Technology

Duane Thompson
Mann Valley Farm

Above: Professor of animal and dairy sciences Laura Hernandez gives an overview of her cow and calf pairing study at the Dairy Cattle Center during a Dairy Summit tour of College of Agricultural and Life Sciences facilities on the UW–Madison campus in Madison, Wis., Nov. 20, 2024. Photo by Michael P. King/UW–Madison CALS

FROM THE LAB TO THE BARN

The Hub connects science and farms, funding research that develops decision-making tools to improve Wisconsin's dairies

MOOVING COWS

"Mooving Cows," an educational video game developed by Jennifer Van Os in UW–Madison's Department of Animal and Dairy Sciences, has been downloaded more than 20,000 times. The game provides dairy workers and enthusiasts with a virtual platform to practice low-stress cow handling skills and is now publicly available.

Photo, right: At the 2024 Dairy Summit, Jordan Matthews of Rosy-Lane Holsteins in Watertown, Wis., noted that the farm integrates the game's completion certificate into its formal training program for employees.

Photo, left: Marvin Herrera, an employee at Rosy-Lane, uses the Mooving Cows game app to train on safe techniques for moving cows from the barn to the milking parlor.

Scan the QR code to read Jordan Matthews' full interview and to learn more about his involvement with the project and how he uses the finished tool in his employee management and training.

ONLINE, SELF-PACED, NUTRIENT MANAGEMENT CURRICULUM

The Division of Extension, Nutrient and Pest Management program developed an online, self-paced nutrient management curriculum at the start of the COVID-19 pandemic, ensuring that farmers could continue to access essential training. This fully-online course, now in its second version, continues to be a valuable resource for farmers, allowing them to work through the modules as their schedules permit. It is now hosted by DATCP."

Photo top: Derek Yanke (left) from Echo-Y Farms in Loganville, Wis., appreciated the convenience and flexibility of the online course, which he took to enhance his knowledge and meet a landlord's requirement.

Photo bottom: The curriculum is delivered in a module-based format, providing users with access to experts and resources at their convenience.

Scan the QR code to request access and enroll in the 2.0 version of the online, self-paced nutrient management planning curriculum.

SMART

Scan the QR code to read more and download the app for Android or Apple.

SMART (SnapPlus Manure Application Realtime Tracker) is an online mapping tool developed by the creators of SnapPlus, which is required for all 590 plans with the Wisconsin Department of Natural Resources. SMART integrates with SnapPlus, allowing users to see where they can apply manure in real time. Users import their Snap files, and the tool moves with them in the field. It is used by custom manure haulers, farmers, and consultants.

Jeremy Heim, a farmer and custom manure hauler from Kewaunee, Wisconsin shared, "We are excited about tracking devices to help us build trust with state and federal agencies. It's been interesting building our experience with the tool. We are trying to be safer and better at applying manure, and this helps with that."

Photo left: The SMART app displays real-time zones where manure can (green) and cannot (red) be applied. It works on tablets and phones, which is critical for field use.

ON-FARM RESEARCH

By partnering in Hub-funded studies, private farms help answer big research questions—and benefit in the process

LUCKWALDT DAIRY

WOODVILLE, WISCONSIN

Dan and Mary Luckwaldt collaborated with Sylvia Kehoe from UW–River Falls on several dairy calf welfare studies focused on disbudding.

Dan Luckwaldt mentioned, “Most modern dairy owners want to be part of university research. From our perspective, there was no downside.”

Mary Luckwaldt observed improvements with the calves disbudded by the research team, noting, “We noticed the paste was much more contained and localized. Prior to the studies, we used too much paste.”

Dan is a UW-Madison alumnus, and Mary is a UWRF alumna, and they remain passionate about creating opportunities for students and graduates.

Photo left: Mary and Dan Luckwaldt with their employees, Derek Fenner (UWRF alum) and Patrick Kusilek (UW–Madison alum).

Scan the QR code to read about Dan and Mary Luckwaldt’s experience participating in Sylvia Kehoe’s calf research.

STONE-FRONT FARM
LANCASTER, WISCONSIN

Andy Buttles from Stone-Front Farm, collaborated with Ryan Pralle at UW–Platteville to develop a blood panel for detecting fatty liver and other metabolic disorders. They co-presented their research at the Dairy Summit and hosted a tour. Buttles is a UW–Madison alumnus.

Buttles emphasized the importance of research in improving calving stress, stating, "With milking cows, the biggest stress is during calving, so if we can do things through this research to make that better, it makes everything easier."

Photo right: Andy Buttles and Ryan Pralle co-presented their research at the 2023 Dairy Summit.

Scan the QR code to watch the presentation where Andy and Ryan co-presented outcomes from the project.

GRASS RIDGE FARM
PITTSVILLE, WISCONSIN

Paul Lippert (photo, on the left) from Grass Ridge Farm collaborates with Francisco Peñagaricano in UW–Madison's animal and dairy sciences department using a GreenFeed machine to collect methane emissions data from his cows. This data supports the Greener Cattle Initiative, a multi-stakeholder, national study which aims to reduce methane emissions through selective breeding and other methods.

Lippert, a UW–River Falls alumnus, practices sustainable farming and grazing, using research from UW–Madison's Marshfield Agricultural Research Station.

By participating in research, Lippert notes that he can observe a project as it happens and have reassurance that data is collected in a real-world scenario. He also emphasizes the importance of conducting research trials across various farms and situations.

"We have always believed strongly in education and research. The university system in this state and the research and outreach they do has brought countless benefits to our dairy. We believe that any way we can be at the forefront of research allows us to navigate potential headwinds and find the avenues that will benefit us overall."

Photo left: Grass Ridge Farm uses a GreenFeed machine to collect methane data from cows' breath.

Summer tour highlights research and farm partnerships in Southwest Wisconsin

On Aug. 12, members of the Dairy Innovation Hub advisory council gathered at the University of Wisconsin–Madison's Lancaster Agricultural Research Station (ARS) for a day of collaboration, learning, and on-site tours highlighting dairy-related research and innovation across southwest Wisconsin.

The event brought together university researchers, farmers, legislators, and industry leaders to review ongoing projects, explore future opportunities, and see how Hub investments are driving progress on both research stations and private farms.

The day began with a tour of Lancaster ARS led by station superintendent Arin Crooks, who provided an overview of current research and highlighted areas for future collaboration. Matt Ruark, faculty director of the Hub and professor and soil science extension specialist in the UW–Madison Department of Soil and Environmental Sciences, discussed the importance of soil health in dairy systems.

"Our soils research is designed to provide practical, science-based solutions that farmers across Wisconsin can use," said Ruark. "By connecting soil health with dairy nutrition and sustainability goals, we're building a more resilient future for the industry."

The group then visited Stone-Front Farm, owned by Andy and Lyn Buttles. This stop illustrated the strong partnerships between university researchers and private farms conducting on-farm trials. Presentations from Andy Buttles, UW–Platteville School of Agriculture director Tera Montgomery, and former assistant professor Ryan Pralle showcased how applied research improves relevance and results.

"We participate in university research because the results mean more to us when the work includes real-world farming scenarios, like ours," said Buttles. "The faculty and students are great to work with."

The visit also emphasized student training. By working on commercial farms, students gain critical hands-on experience and better understand the real-world challenges facing dairy farmers. Buttles has mentored more than 60 student interns from local high schools, technical colleges, and universities.

Next, the group toured UW–Platteville's Pioneer Farm, where faculty and staff showcased the impact of Hub investments. Inside the dairy center, Montgomery and Pioneer Farm director Chuck Steiner introduced technologies such as automated milking systems, Ric2Discover feeding gates, and a Greenfeed machine to measure greenhouse gas emissions. These tools improve efficiency, monitor cow health, and reduce waste.

Assistant professor Joseph Sanford and Steiner also presented manure management research, including anaerobic digestion and biochar production. These projects aim to reduce environmental impacts while creating value-added products from dairy waste.

"Investments like these are a direct result of the Dairy Innovation Hub's commitment to integrating cutting-edge research into daily farm operations," said Steiner. "They allow us to test technology in real farm conditions, so farmers can see how it works before making investments themselves."

The day wrapped up with ice cream

from Pioneer Sweets, a student-led business. Participants used the time to ask final questions, share insights, and view additional research posters from Hub-affiliated campuses.

From soil science to student learning, the Aug. 12 tours demonstrated the Dairy Innovation Hub's strong focus on collaboration and practical impact. As Ruark noted, "The Hub is about bringing people together—farmers, researchers, students—to create solutions that work in the field, in the barn, and in the marketplace."

Facing page: Tour guests ride the "people wagon" at the Lancaster ARS on Aug. 12, 2025. Above: Andy Buttles farms with his family in Lancaster, Wis. He has also hosted several research trials on his farm and employed numerous interns. Left: Hub-funded faculty member Joseph Sanford showcases his research on manure digesters and biochar. Members of the advisory council, along with farmers, and local leaders attended the tour. Photos by Nguyen Tran/ Dairy Innovation Hub

NEW FACULTY PROFILE

Yun Jiang

Assistant Professor | Animal and Dairy Sciences
UW–Madison | *start date August 2024*

What is your hometown? Where did you grow up?
I was born in a small village near Hefei City, Anhui Province in China. I later moved to Jiangsu Province for middle school.

What is your educational/professional background, including your previous position?
I received my bachelor's in animal science from Nanjing Agricultural University, followed by a master's and PhD in animal science from the University of Florida. Prior to joining the UW–Madison in August 2024, I served as an assistant professor of livestock nutrition at Kentucky State University.

What is your field of research, and how did you get into it?
My field of research is dairy nutrition. I developed an interest in dairy nutrition in college when I gained an understanding of how dairy cows can convert human-inedible feed – such as grass and agricultural byproducts like rice straw – into milk. I realized this is crucial for feeding the growing global population with the limited resources available on Earth.

What are the main goals of your current research program?
The main goals of my current research program are to develop nutritional strategies to optimize feed efficiency, reduce environmental impacts such as methane emissions, and improve feed quality and safety in the dairy industry.

What was your first visit to campus like?
My first campus visit was after a huge snowstorm in January 2024. I was fascinated by people ice skating on ponds and lakes — it felt unreal. Growing up in southern China, I had never really seen this in real life. I was also amazed by the facilities and the capacity for dairy research at UW–Madison.

What's one thing you hope students who take a class with you will come away with?
Nutrition is an art of balance—not just in terms of feed rations, but in applying science to real-world farm conditions. I want students to leave my class understanding that feeding dairy cows is both a science and a craft. It involves critical thinking, adapting to changing conditions, and making informed decisions that support animal health, farm profitability, and environmental sustainability. If students come away with the ability to think holistically and ask thoughtful, evidence-based questions, then I've done my job.

Do you feel your work relates in any way to the Wisconsin Idea?
Yes, my work strongly reflects the Wisconsin Idea, which emphasizes that the benefits of university research and knowledge should extend beyond the campus to improve the lives of people throughout the state. Through applied research and outreach focused on improving dairy production efficiency and reducing environmental impacts, my work directly supports Wisconsin's dairy farmers—many of whom are the

backbone of rural communities. By developing practical, science-based solutions that farmers can implement, we help farms become more productive and sustainable, and we also support the state's broader goals of environmental stewardship, economic resilience, and rural vitality. The collaborative nature of my work ensures that outcomes are grounded in real-world conditions.

What's something interesting about your area of expertise that most people don't know?
Did you know that cows can produce up to 45 gallons of saliva daily? It's not just for digestion — saliva plays an important role in buffering acids in the rumen, ensuring the microbes can keep breaking down the feed efficiently. This natural system helps keep cows healthy and supports steady milk production.

What are your hobbies and other interests?
I enjoy playing pickleball. I also love reading and learning about new things; the sense of discovery makes life much more interesting to me. Whether it's exploring a new topic or picking up a new skill, I'm always curious and motivated to keep growing.

Top: Together with members of her lab, Jiang is building a research program developing nutritional strategies to improve feed efficiency, reduce environmental impacts, and improve feed quality and safety. Photo contributed. Bottom: Specialized feed bins allow researchers like Jiang to track individual feed intake and test feeding strategies under specific conditions. Photo by Michael P. King/UW–Madison CALS. Article adapted with permission from UW–Madison CALS.

NEW FACULTY PROFILE

Gregg Sanford

Assistant Professor | Soil and Environmental Sciences
UW–Madison | *start date August 2024*

Where did you grow up?
I am an army "brat"! I was born in Okinawa, Japan, and moved a lot while growing up. Between Japan, western Europe, and the US, I lived in nine different cities before college. Many summers were spent on my grandparent's dairy farm in Viola, WI. I've always considered Viola my "hometown" because of deep family roots.

What is your educational/professional background, including your previous position?
I did my undergraduate studies in field botany at New College of Florida in Sarasota. After working on a few farms, I earned my MS and PhD in the Department of Agronomy here at UW–Madison. Between 2012 and 2024, I worked as a research scientist in Randy Jackson's Grassland Ecology Lab.

What is your field of research, and how did you get into it?
I study agricultural systems and how our management of them affects critical ecosystem services like soil carbon sequestration and climate resilience. I've always loved plants and farming. While working on farms in my early 20s, I learned about the interconnectedness of crops, soils, water, and climate. I realized that agriculture had the potential to alleviate or exacerbate many of the wicked problems facing society in the 21st century. I wanted to be part of the solution; the rest is history.

What are the main goals of your current research and outreach programs?
A lot of my work approaches agricultural systems through the lens of ecological intensification. The object is not to maximize a single outcome (yield, for example) but to optimize several ecosystem services (carbon sequestration, water quality, soil structure, yield, profitability).

What was your first visit to campus like?
Wow, that was a long time ago. I met the late Dr. Josh Posner (my master's & PhD advisor) and Janet Hedtcke (current superintendent at West Madison ARS) for ice cream at Babcock in September of 2004. It was just before my first semester of graduate school. I remember loving the school, laughing at Josh's jokes, thinking Janet was super cool, and wondering if I could make it!

What's one thing you hope students who take a class with you will come away with?
A sense of wonder and excitement about soils and agroecosystems. The world is a complex and beautiful place. Science is amazing, soils are amazing, crops are amazing, and people are odd but also amazing! If you don't walk away from your classes inspired and excited about your studies, you should think hard about what you are doing.

Do you feel your work relates in any way to the Wisconsin Idea?
Absolutely! My research aims to serve all members of our community by building agricultural systems that stabilize carbon, clean our water, protect our soils, provide resilience to a changing climate, and

help put food on the table (literally and figuratively). At a more granular level, I am the director of the 60-acre, 36-year-old Wisconsin Integrated Cropping Systems Trial (WICST). This long-term experiment serves as a land lab for community engagement, a classroom for undergraduate and graduate students, and an invaluable hub for national and international scholarship.

What's something interesting about your area of expertise that most people don't know?

It doesn't take much for me to wax poetic about soils and the importance of soil organic carbon to the global carbon cycle ("Did you know that there is more organic carbon in our soils than in the atmosphere and all above ground organisms combined!"). It's a powerful reminder of how much impact lies beneath our feet.

What are your hobbies and other interests?

I love to sail, play music with friends (guitar, mandolin, fiddle), run, and hike.

Above: Sanford takes soil samples as part of the Soil Organic Carbon Network (SOCnet), which brings farmers and scientists together to better understand the hidden life of soil. Through on-farm research and long-term experiments in Wisconsin, Iowa, and Minnesota, SOCnet tracks how farming practices affect soil health and carbon. By connecting research with real-world farming, the network is helping farmers care for their land while exploring new opportunities in carbon markets. Below: Sanford's research also focuses on ecological intensification, which works with nature to grow crops more sustainably. Practices like cover crops, reduced tillage, and crop-livestock integration can improve soil health, boost yields, and reduce reliance on synthetic fertilizers. Photos contributed. Article adapted with permission from UW–Madison CALS.

NEW FACULTY PROFILE

Rebecca Smith

Assistant Professor | Plant and Agroecosystems Sciences | UW–Madison | *start date August 2024*

What is your hometown? I was born and raised in Winnipeg, Manitoba, Canada. For a point of reference, Winnipeg is directly north of Fargo and Grand Forks, North Dakota, and is also close to the longitudinal center of Canada.

What is your educational/professional background, including your previous position?
I earned my bachelor's in botany (honors) at the University of Manitoba and then got my PhD in botany at the University of British Columbia. I moved from Vancouver to Madison for my postdoctoral research in John Ralph's lab as part of the Great Lakes Bioenergy Research Center (GLBRC) and continued on as a scientist in GLBRC until I accepted my faculty position in the Department of Plant and Agroecosystem Sciences with support from the Dairy Innovation Hub.

What is your field of research, and how did you get into it?
I study the plant cell wall, more specifically a polymer in the cell wall called lignin, at basic biological and applied levels. I fell in love with plant biochemistry and specialized metabolism as an undergrad and was excited to start studying the cell biology of lignin in grad school because it sits at the intersection of primary and specialized metabolism. My research as a postdoc and staff scientist expanded on my lignin work by identifying ways lignin can be engineered in bioenergy crops to improve cell wall digestibility for biofuel and bioproduct production.

What are the main goals of your current research and outreach programs?
In my current position, I'm excited to expand my knowledge of the cell wall and lignin to address different challenges related to dairy sustainability. As part of the Dairy Innovation Hub, my lab will be working to leverage the power of the cell wall to improve cell wall digestibility, reduce methane emissions and increase carbon sequestration. We are aiming to find plant engineering strategies that will address farmers' biggest challenges in the forage crops they are growing.

What was your first visit to campus like?
I first visited campus in the last year of my graduate studies. I came to John Ralph's lab to run some experiments for my thesis and was impressed by how much there was to do around campus!

What's one thing you hope students who take a class with you will come away with?
I hope that students will come away from my courses with an appreciation for how complex and fascinating plants are. The genetic engineering possibilities in plants are vast, but plants also have an amazing amount of natural variation, particularly in specialized metabolism.

Do you feel your work relates in any way to the Wisconsin Idea?
Yes, it does! My research in bioenergy and dairy sustainability embodies the Wisconsin Idea because

it is focused on finding innovative ways to address crop-related challenges in the bioenergy and dairy industries that will directly impact the future of agriculture in Wisconsin.

What's something interesting about your area of expertise that most people don't know?
Some of the cells that put lignin in their cell walls die very quickly so that they can conduct water through the plant body, but lignin deposition continues after the cells die. This post-mortem lignification occurs through the contributions from living adjacent cells and is referred to as the good neighbor hypothesis, demonstrating that even plant cells need a little help from their neighbors from time to time.

What are your hobbies and other interests?
I really enjoy hiking, camping and paddling (sometimes all on the same trip) with family and friends, discovering new locations for fun outdoor adventures, and finding live music around Madison. I love bike commuting to campus every day. Even in the middle of winter, catching the sunrise over the lake from the bike path is unbeatable! Baking is another one of my hobbies – there are so many parallels between following an experimental protocol and following a recipe, but baking definitely yields tastier results!

Top: Smith trims shoots from young Sorghum plants in the Walnut Street Greenhouse at UW–Madison as part of a research trial exploring improvements to the plants' cell wall for increased digestibility in dairy cattle. Bottom: Smith leverages both the field and the lab for her multidisciplinary approaches, including cutting edge genetic tools, cell and molecular biology, microscopy, biochemistry and analytical chemistry, to probe basic and applied questions about the plant cell wall. Photos by Maria Woldt/Dairy Innovation Hub and contributed. Article adapted with permission from UW–Madison CALS.

NEW FACULTY PROFILE

Md Azhar Uddin

Assistant Professor | Agriculture Economics
UW–River Falls | *start date August 2024*

What is your hometown? I grew up in Chittagong, a major metropolitan area in southeastern Bangladesh. Some of my most formative experiences came from visiting my grandparents' home in the village, where I experienced farming life firsthand. That early exposure to agriculture, seeing how food is grown and understanding the challenges farmers face, left a lasting impression on me.

What is your educational/professional background, including your previous position?
I completed my PhD in Food and Resource Economics at the University of Florida, where I specialized in agribusiness marketing, sustainability, and consumer behavior. Before my PhD, I was an assistant professor at the Institute of Health Economics at the University of Dhaka. Prior to that, I worked at BRAC's Research and Evaluation Division in Bangladesh as a research associate.

How did you get into your field of research?
During my undergraduate and master's studies, I realized that economics is a powerful tool for understanding society and its challenges and identifying meaningful solutions. That curiosity led me toward research. I found myself drawn to real-world questions, especially those that lie at the intersection of food systems, sustainability, and market behavior.

What are the main goals of your research program?
My research program focuses on the financial sustainability of Wisconsin's dairy farms. I'm currently studying the patterns and risk factors behind dairy farm exit using machine learning models. This work can directly support Wisconsin's farm succession and extension programs by identifying farms at risk and enabling proactive support. In addition, I'm exploring the feasibility of establishing a choice and sensory lab at UW–River Falls to promote collaboration across teaching, research, and the dairy industry. I believe such a lab can drive dairy product innovation, deepen our understanding of consumer preferences, and enhance experiential learning opportunities for students. Recently, I also received a Dairy Export Promotion Grant from the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) to study international market opportunities for Wisconsin dairy products.

What attracted you to UW–River Falls and the Dairy Innovation Hub?
During my PhD, I built a strong foundation in agribusiness marketing, and I was eager to apply that skill set in a real-world context. The Dairy Innovation Hub—and Wisconsin's vibrant $52.8 billion dairy industry—offered the perfect opportunity. UW–River Falls stood out for its commitment to student-centered learning and applied research. It felt like a place where I could grow as a researcher and educator while bringing meaningful support for the industry.

What was your first visit to campus like?
I am a college-town type of person, so River Falls immediately felt like home. I still remember my

breakfast meeting with Brenda Boetel and Sierra Howry on my first day—it was such a warm and welcoming start that I left feeling confident this was the right place.

What's one thing you hope students who take a class with you will come away with?
I hope my students leave class with a deeper appreciation for real-world problem-solving and data-driven decision-making in the food and agricultural sectors. If they also leave my class feeling curious, empowered, and just a little more interested in agricultural economics, that's a win.

Do you feel your work relates in any way to the Wisconsin Idea?
Absolutely. The Wisconsin Idea is about ensuring that education and research extend beyond the classroom to benefit the broader public. My work is grounded in that principle, whether it's identifying farms at risk, improving marketing strategies, or opening new export pathways, the goal is to generate insights that directly serve the state's dairy industry and communities.

What are your hobbies and other interests?
I enjoy learning new skills. Right now, I'm getting into woodworking and planning to build a dresser for my daughter. It delights me that I am creating something meaningful.

Above: Uddin presents at the 2025 Dairy Symposium event in Madison about his research using machine learning to predict farm exit. Below: Uddin's research prior to coming to UW–River Falls centered on agribusiness marketing, sustainability, and consumer behavior. He's now applying that expertise to the Wisconsin dairy industry. Photo by Pat Deninger/UW–River Falls

FACULTY FOLLOW-UP

Pioneering innovation: Zifan Wan's cold plasma research at UW–Platteville

Zifan Wan, a UW–Platteville food scientist, is pioneering cold plasma technology to improve food safety, dairy processing, and sustainable agriculture. Backed by the Dairy Innovation Hub, her research offers chemical-free, eco-friendly solutions for a more resilient and efficient dairy industry.

Above: Cold plasma, the force behind the Northern Lights, is now being explored for innovative uses in agriculture. Right: Wan spoke about the agricultural applications of cold plasma at the 2023 Dairy Summit event, hosted by UW–Platteville. Photo by Andy McNeill/UW–Platteville

At the intersection of food science, agriculture, and sustainability, cutting-edge research is reshaping the future of dairy. Dr. Zifan Wan, assistant professor at the University of Wisconsin–Platteville, is leading efforts to harness cold plasma technology for safer food, more sustainable agriculture, and cleaner dairy processing. With support from the Dairy Innovation Hub, Wan is developing chemical-free, eco-friendly solutions that address real-world challenges in the dairy industry.

Wan is one of 17 faculty funded through the Dairy Innovation Hub across UW–Madison, UW–Platteville, and UW–River Falls.

Choosing UW–Platteville to build a research program

Wan's passion for food science is rooted in a curiosity about how technology can improve food safety and sustainability. During graduate studies, she discovered cold plasma technology—an emerging tool that can inactivate pathogens, extend shelf life, and boost crop yields without chemicals.

In 2021, she chose UW–Platteville to launch her research. "I have a strong passion for dairy foods research, and Wisconsin—America's Dairyland—was the place to be," Wan says. The Dairy Innovation Hub offered the ideal platform for interdisciplinary, industry-relevant research.

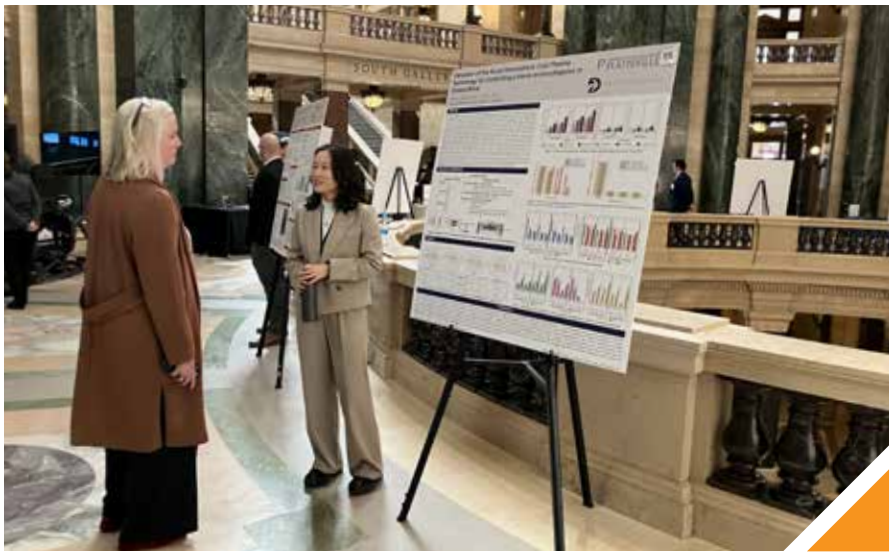
Driving innovation through the Dairy Innovation Hub

The Hub provides funding and collaborative opportunities to address practical industry needs. Wan credits this support for advancing her work on cold plasma applications in dairy and agriculture.

"The Hub has created a collaborative environment across campuses to tackle real-world dairy challenges," she says. Through Hub funding, Wan has explored pathogen control in dairy products and the use of plasma-activated water (PAW) in sustainable farming.

Events like the Dairy Summit and Dairy Symposium also offer platforms to share research and gather industry feedback, keeping her work aligned with real-world priorities.

Tera Montgomery, Director of the School of Agriculture at UW–Platteville, highlights Wan's cross-disciplinary impact: "Her work supports



food production, crop health, animal welfare, and agricultural innovation—all aimed at strengthening rural businesses."

Research highlights and hands-on learning

Wan has made major strides in research, innovation, and education. Her campus lab features custom-built cold plasma systems supporting both academic and industrial research. With National Dairy Council (NDC) funding, she's studied how to eliminate Listeria in brined cheeses, while mentoring undergraduate and postdoctoral researchers.

Her work also extends into sustainable agriculture. She's exploring PAW as a fertilizer and seed treatment, reducing the need for chemical inputs. Wan has also created hands-on courses, like Dairy Products Processing & Analysis and Cheese Making 101, to equip students with industry-ready skills.

Clean-in-place sanitation with plasma-activated water

A core focus of Wan's research is using PAW for sanitizing dairy processing equipment. Traditional cleaning methods often use harsh chemicals that leave residues and harm the environment. PAW offers a safer, more sustainable alternative.

Created by exposing water to cold plasma, PAW contains reactive oxygen and nitrogen species that destroy bacteria such as Listeria, E. coli, and Salmonella. It also penetrates and disrupts biofilms, a persistent problem in dairy plants.

By integrating PAW into clean-in-place systems, processors can reduce chemical usage and improve food safety with minimal environmental impact.

Cold plasma in sustainable agriculture

Wan's research also explores agricultural uses of cold plasma to reduce reliance on synthetic inputs and promote eco-friendly practices:

- **Seed treatment:** Plasma boosts germination and fungal resistance without chemical coatings.
- **Natural fertilizers:** PAW enriches irrigation water, promoting growth with fewer synthetic additives.
- **Organic waste treatment:** Cold plasma reduces emissions (methane, ammonia) and enhances compost quality.
- **Food waste treatment**: Accelerates decomposition and nutrient recycling.
- **Air and water purification:** Removes pollutants from runoff and agricultural waste.

"Cold plasma provides multiple pathways for sustainable farming," Wan says. "It's a versatile, chemical-free tool for agriculture."

Improving shelf life of dairy products

Wan also investigates improving the freeze stability of dairy products. Her research on dairy protein modification offers insights into reducing texture loss

Above: Wan speaks to Rep. Ann Roe about her cold plasma research during a poster session at the State Capitol. Photo by Maria Woldt/Dairy Innovation Hub. Facing page: Wan is building a research program dedicated to improving dairy food production and processing. Cold plasma, a novel non-thermal technology, has proven effective in microbial inactivation while preserving food quality. Photo by Andy McNeill/UW–Platteville

and syneresis (wheying-off) in frozen products like ice cream and cream cheese.

"Modified proteins may help preserve product structure during freezing and thawing," she explains. These findings could help processors extend shelf life without sacrificing quality.

Looking ahead: on-farm applications and industry impact

Wan's future goals include developing portable cold plasma systems for on-farm use—enabling farmers to treat seeds, manage waste, and enrich soil without chemicals.

She's also focused on bridging the gap between research and commercialization. Regulatory approval is key to broader adoption, and Wan is working with agencies like the FDA and USDA to move cold plasma technology toward industry-scale use.

"My research aims to expand industry collaboration for pilot testing, technology transfer, and commercialization," she says. "By partnering with farmers and food processors, we can bring plasma innovations to life."

Montgomery notes that Wan's collaborative, multidisciplinary approach is a model for impactful research: "Her work connects engineers, cheese makers, food safety experts, agronomists, and more—creating real solutions for the dairy industry."

Shaping a sustainable future

With the backing of the Dairy Innovation Hub, Wan is advancing science that improves food safety, enhances dairy production, and promotes sustainability. Her work with cold plasma technology is creating chemical-free, energy-efficient tools that could revolutionize agriculture and food processing.

As the dairy industry moves toward more sustainable and tech-driven practices, Wan's research stands out as a driving force for safer, cleaner, and more resilient food systems.

From calf chores to cattle consulting

Before launching her professional career, Kaylee Riesgraf was the first graduate student funded by the Dairy Innovation Hub. For the past two years, she has worked as a dairy nutritionist, helping Wisconsin farmers achieve their goals. Now, she's playing a key role in shaping the future of dairy.

Growing up on the farm

Riesgraf's story starts on her family's 1,000-cow dairy, A&L Lisowe Acres, near New Holstein, Wisconsin. The farm, founded by her great-grandfather, remains in the family today. Her mother manages the calves and heifers—an area Riesgraf naturally gravitated toward as a child.

"While I never appreciated the hard work until I left for college, growing up with farm responsibilities teaches a great deal of work ethic and teamwork," she said.

A new direction at UW–River Falls

Riesgraf found her college home at UW–River Falls, drawn in by its small-town feel and strong agricultural roots. She originally planned to become

a large animal veterinarian. But after shadowing vets and reflecting on her lifestyle goals, she realized the profession might not be the right fit.

A conversation with her advisor, Steve Kelm, during her junior year opened the door to something new: graduate school and research.

"From the very beginning, it was clear that she was bright and curious," Kelm recalled. "She had the opportunity to complete undergraduate research, and that was pivotal."

She began asking more questions, digging deeper into how research connects to real-world farming, and found herself energized by the possibilities.

A leap to UW–Madison and the Dairy Innovation Hub

At the time, the newly launched Dairy Innovation Hub was seeking a student from UW–River Falls to work on a collaborative project at UW–Madison. Despite some initial doubts about moving to a larger university, Riesgraf met several times with Dr. Kent Weigel and eventually added her name to the proposal.

Once the Hub funded the project, she jumped in. "I was all in and excited to be part of the project," she said.

Weigel immediately noticed her drive. "She's a self-starter and fearless," he said. "When I asked her to speak to the UW Board of Regents about the Hub, she said, 'Sure, no problem.'"

Research on early-life stress in dairy heifers

At UW–Madison, Riesgraf focused on how early-life stressors affect dairy heifer development. Her first study examined in-utero heat stress, using data from heifers whose dams experienced intense heat during late pregnancy in Florida. The second explored how social housing—raising calves in pairs vs. individually—affected growth and methane emissions.

One of her favorite tools was the GreenFeed system, which measures emissions from animals.

"Heifers pair-housed from birth were still heavier later in life, with no negative effects on efficiency or emissions,"

she said. In contrast, in-utero heat-stressed heifers showed compensatory growth—catching up in size despite being smaller at birth.

Weigel noted the promising results: "It's good news—

Facing page: Reisgraf speaks during the 2022 Dairy Summit hosted by UW–River Falls. Photo by Pat Deninger/UW–River Falls. Top: Riesgraf grew up on her family's 1,000-cow dairy, A&L Lisowe Acres, located near New Holstein, Wis. Photo contributed. Bottom: Riesgraf works with specialized feeding equipment at the Marshfield Agricultural Research Station during the summer of 2021. Photo by Nancy Esser

> *My goal was to be on-farm, providing value to farmers. Nutritionists do more than write diets—we're problem-solvers, advisors, and sometimes therapists.*

dairy heifers seem able to recover from early stress without long-term performance loss."

Learning across disciplines

Riesgraf collaborated with five professors from diverse specialties—nutrition, heat stress, animal behavior, genomics, and data science.

"I learned quickly that it's faster to go directly to experts and ask for help," she said. That openness helped her thrive in an interdisciplinary environment—one of the Hub's core goals.

She also gained confidence communicating complex ideas to different audiences, a skill that now helps her translate science into practical tools for farmers.

Starting a career in dairy nutrition

Riesgraf earned her master's degree in May 2023 and explored several options, including pursuing a PhD. Ultimately, she chose dairy nutrition, seeking a hands-on role that kept her close to the cows and the people who care for them.

"My goal was to be on-farm, providing value to farmers," she said. "Nutritionists do more than write diets—we're problem-solvers, advisors, and sometimes therapists."

A peer helped connect her with Purina/Land O'Lakes, where she now works as a dairy nutritionist in rural Wisconsin. Her work includes walking pens, sampling feed, analyzing data, and—most importantly—connecting with farmers.

"There's no cookie-cutter solution," she said. "Each farm is unique, and my training helps me ask better questions and interpret data in meaningful ways."

Life in rural Wisconsin

Today, Riesgraf lives in Menomonie, Wisconsin, with her husband Jacob—whom she met at UW–River Falls—and their daughter Finlee, born shortly after Riesgraf completed her master's degree at UW–Madison.

Balancing motherhood and full-time work has its challenges, but she embraces it with gratitude. Outside of work, she enjoys pickleball with the local club and spending time with family.

She brings her full self to her work. "I talk with farmers about cows and nutrition, but also about my husband, daughter, and hobbies," she said. "I

genuinely want to know the people behind the cows."

Her personal and professional lives are deeply intertwined—farming is more than a job; it's a shared way of life.

Looking ahead

Riesgraf's long-term vision includes deepening her roots in the dairy community. She and Jacob hope to someday buy a home and land in one of the surrounding rural townships, raising their daughter in a place that mirrors their own farm upbringings.

"I want to keep learning and become a more valuable resource for farmers," she said. "The research skills I gained—reading scientific papers, analyzing data, thinking critically—serve me every day."

From early mornings in the calf barn to consulting with farmers across Wisconsin, Riesgraf is living out the mission of the Dairy Innovation Hub: to grow the next generation of dairy leaders.

FINDINGS

Riesgraf studied how early-life stressors shape dairy heifer development, focusing on in-utero heat stress and social housing. She found pair-housed calves stayed heavier later in life without harming feed efficiency or increasing methane output.

Heifers exposed to heat stress before birth were smaller initially but caught up through compensatory growth, showing little long-term impact. Overall, the results highlight heifers' resilience to early stress.

EXPLORE ONLINE

Scan the QR code to read the full story about Kaylee Riesgraf's journey.

Facing page Riesgraf is a dairy nutritionist with Purina/Land O'Lakes based in Western Wisconsin. Above: Kaylee, Jacob, and Finlee Riesgraf have settled into their lives in rural Wisconsin where they are active in their community. Finlee was born a few months after Riesgraf completed her master's degree. Photos contributed

RESEARCH COLLABORATION

Elizabeth McGuire uses technology to improve life for cows, support farmers

Jennifer Van Os
associate professor
animal and dairy sciences
UW–Madison

Ryan Pralle
former assistant professor
School of Agriculture
UW–Platteville

Kate Creutzinger
former assistant professor
UW–River Falls. Current
faculty Univ. of Vermont

Elizabeth McGuire's journey might seem unconventional, but for her, it's been a natural evolution. With deep roots in rural Wisconsin and a lifelong connection to agriculture, McGuire has always been drawn to the rhythm of farm life and the well-being of animals. Having just finished her master's degree in dairy science at UW–Madison, she's bringing together her background in education, her love for cows, and a fascination with agricultural technology to address a critical question in the industry: Can robotic milking systems be used to improve the dry-off process for dairy cows?

Her research, which explores gradual, cow-driven dry-off using automatic milking systems, is both innovative and collaborative. The project bridges expertise across UW–Madison, UW–Platteville, and UW–River Falls, supported by the Dairy Innovation Hub. It also reflects McGuire's broader mission: creating science-based, animal-centered solutions that can be implemented on real farms.

McGuire's passion began on her grandparents' farm in southern Wisconsin, where she developed a deep appreciation for animals and agriculture. Through FFA and related programs, she gained leadership experience and pride in representing the farming community. At UW–Platteville, she pursued agricultural education, drawn by its hands-on programs and close-knit campus.

"I appreciated the practical curriculum and the chance to build meaningful relationships with professors and peers," she says. That foundation prepared her for graduate research focused on animal welfare.

After earning her degree, McGuire taught high school agriculture. "Teaching was incredibly rewarding, but I realized how much I missed working directly on farms," she says. That realization led her to UW–Madison's master's program, where she joined a cross-campus project supported

by the Hub. She also carried her educator mindset forward, mentoring undergraduates and guest teaching courses.

Traditionally, cows are dried off abruptly before calving, but this can cause discomfort and increase infection risk. McGuire saw potential in robotic milking systems, which allow cows to choose when to be milked, to support a more gradual, individualized process. "My research focused on how abrupt versus gradual dry-off affects productivity, behavior, and udder health," she explains. "We found differences in behavior and signs of discomfort, suggesting gradual dry-off can better support welfare while remaining practical for farmers." Higher-producing cows took longer to dry off voluntarily, showing that a one-size-fits-all approach doesn't meet every animal's needs.

"This approach uses existing technology to customize protocols," says Jennifer Van Os, associate professor at UW–Madison. Kate Creutzinger, who helped initiate the project at UW–River Falls, added, "Seeing what cows will do when given control over their dry-off provides valuable insights for data-driven decision-making."

The study's success was fueled by cross-campus teamwork. "UW–Madison provided expertise in animal welfare, UW–Platteville supported on-farm logistics, and UW–River Falls offered mentorship," says McGuire. Van Os praised McGuire's fresh perspective, while Platteville's Ryan Pralle noted her independence and growth as a researcher. Creutzinger credited Hub funding for enabling collaboration across institutions.

McGuire's research has already sparked interest from farmers and scientists, highlighting how technology can reduce mastitis risk, improve welfare, and individualize care. "I hope to bridge the gap between science and on-farm practices," she says. "My goal is to support animal well-being and the long-term sustainability of farming."

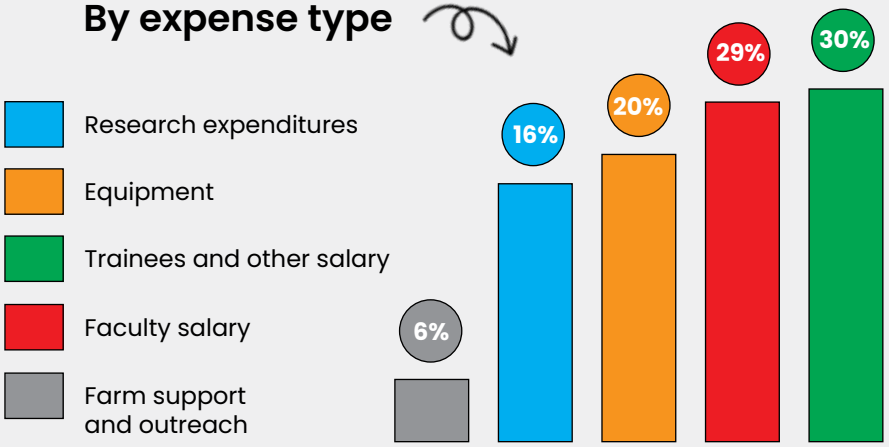
EXPLORE ONLINE *Scan QR code to read the full story about Elisabeth McGuire's research.*

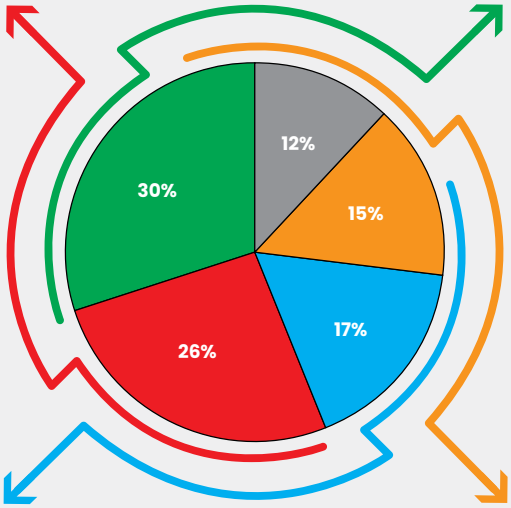
Facing page and above left: McGuire leveraged the cows and technology at UW–Platteville's Pioneer Farm to complete her research. Photos contributed. Above right McGuire speaks about her research at the 2024 Dairy Summit hosted by UW–Madison. Photo by Nguyen Tran/Dairy Innovation Hub

FINANCIAL OVERVIEW

Fiscal Year 25: July 1, 2024 - June 30, 2025

By expense type





By priority area

- Farm business and community
- Human health and nutrition
- Animal health and welfare
- Land and water
- Administrative

FY 25 projections from the approved spending plan mirror, almost exactly, actual expenses for the year. Funding was approved in October 2019, and the initial investments of $1M in FY 20 and $7.8M per year thereafter have seeded recruitment of new talent, capacity-building equipment, and research projects in just six short years.

With more than 260 awards to date, projects are in various stages of progress. Awards often span multiple years and are tracked according to their approved budgets, resulting in partial spending in a given fiscal year. Funds have naturally distributed across the Hub's four priority areas leading to maximum impact for the dairy community.

FY 25 FINANCIAL HIGHLIGHTS:

Nearly
$4.2M
for faculty, trainees and staff
NEW DAIRY TALENT

Total
$7.8M
FUNDS ALLOCATED
for dairy initiatives

COMMUNICATIONS STRATEGY

SOCIAL MEDIA

- 5,117 followers across four social platforms, a 22% increase over FY 24
- LinkedIn continues to be the top performing platform
- 129,514 impressions on LinkedIn in FY 25, average engagement rate is 7%, which is considered very high by social media standards
- Top Facebook post: "How can collaborating with the Hub benefit farmers?", Rosy-Lane Holsteins and Jennifer Van Os
- Top X post:, "Matt Ruark named new faculty director", 5% engagement rate in FY 25
- 16.1k views on YouTube. A 67% increase year over year.

MEDIA RELATIONS

- 394 popular press mentions, consistent with FY 24. Total engagement of 1.1k, which is up 150% from last report
- Twelve press releases distributed to media promoting funding decisions at UW–Madison, UW–Platteville, and UW–River Falls
- Regular media interviews with Hub staff and researchers

OUTREACH IMPACT

- Dozens of public and stakeholder presentations given by Hub staff. Including campus centers, conferences, information sessions, trade groups, agencies, and legislators
- Multiple in-kind articles and blog posts authored by Hub staff (not including researchers), contributed to stakeholder publications
- Continued a campaign targeting farmer-facing marketing and outreach opportunities, including a partnership with Alice in Dairyland

E-NEWSLETTER

From its onset, maintaining close communication has been a priority for the Hub. The Hub maintains a quarterly e-newsletter that sends to more than 1,650 (and growing) unique Hub stakeholders, funded researchers, dairy leaders, state agencies, and key legislators.

Contacts are invested in some way with the Hub, and have "opted in" to receive content. Mass or purchased email lists are not used, and all content is original. Increasingly, citizens and related public groups are interested in Hub initiatives and have subscribed to the e-newsletter.

Anyone interested in receiving updates from the Hub can sign up at dairyinnovationhub.wisc.edu. All content is free and publicly available.

CONFERENCES AND EVENTS

DAIRY SUMMIT

The Hub held its fifth annual Dairy Summit on Nov. 20, 2024. The event was hosted by UW–Madison in a hybrid format. There were 303 registrations, which was the largest attendance to date. Most attendees participated in person, with strong live viewership and on-demand virtual engagement afterward.

The summit included welcome remarks, progress reports on Hub-funded research projects, as well as dairy farmers using Hub-developed innovations. In-person attendees enjoyed two robust tour options including campus facilities and the Arlington Agricultural Research Station. The Dairy Summit highlights the Hub's *newest* research and is formatted for a public audience.

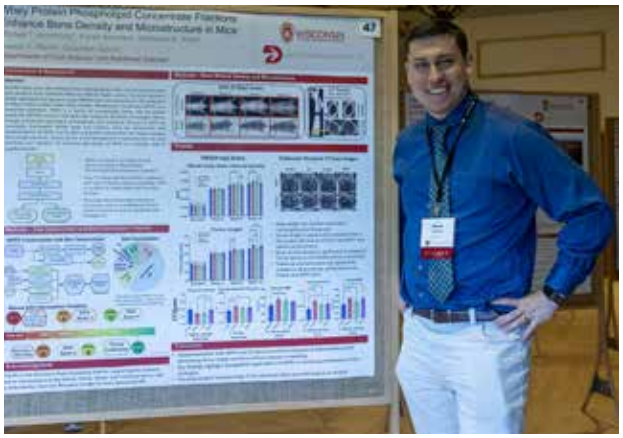
DAIRY SYMPOSIUM

The Hub hosted its fourth annual Dairy Symposium on May 14, 2025, at the Memorial Union on the UW–Madison campus. The day-long event drew over 250 attendees—including researchers, students, academic partners, and campus affiliates—making it the largest symposium to date.

Through poster sessions, keynote presentations, breakout discussions, and student flash talks, the Dairy Symposium highlighted examples of the Hub's most advanced research and facilitated discussions about how this work can help meet the challenges facing today's dairy community.

The symposium is the academic-focused companion to the public-focused Dairy Summit held each November.

"The symposium is a great chance to learn about the scientific projects being done by Hub-backed researchers," said Dave Daniels, chair of the Dairy Innovation Hub advisory council and owner of Mighty Grand Dairy in Union Grove, Wis. "I learned about updates to SnapPlus and that's great information to get out to farmers because they have to have a nutrient management plan to participate in farmland preservation or other state grant programs."



From top: Governor Tony Evers gave opening remarks at UW–Madison during the Dairy Summit. Middle: UW–Madison graduate student Mitchell Armstrong presents a poster during the Dairy Symposium. Bottom: Cristine Morgan from the Soil Health Institute, speaks at Dairy Symposium. Photos by Nguyen Tran/Dairy Innovation Hub

TAKING RESEARCH ON THE ROAD

Outreach and education are core tenets of the Dairy Innovation Hub. One of the best ways to share outcomes from Hub-funded research is by having a presence at meetings, conferences, and events. This year, the Hub team hit the road and shared project outcomes from researchers at UW–Madison, UW–Platteville and UW–River Falls with the public.

In March, the Hub hosted an informational research poster session at the State Capitol to highlight research at each participating campus. Legislators, staff, and the public browsed research posters and engaged with students and faculty affiliated with Hub-funded projects. The poster session was co-located with Wisconsin Farm Bureau Federation's Ag Day at the Capitol.

This winter, the Hub had a presence at the Dairy Strong conference and the PDP Business Conference. Also at the Business Conference, PDP invited two Hub-funded faculty to present on the Preview Stage. For the fourth year, 30 research posters were displayed in the Nexus Innovation Lane area. This space is dedicated to inventors, creators, and idea-generators sharing their most novel ideas.

This spring, the Hub continued a strategic farmer-focused outreach campaign to increase awareness with farmers and related agriculture channel partners. The campaign includes several key elements such as advertisements with top agriculture news websites, engagement with the Alice in Dairyland program, and involvement in multiple state agriculture communicators groups. These paid and earned media opportunities are leading to increased communication and awareness across Wisconsin agriculture groups, farmers, and dairy processors.

During the summer months, the Hub had the unique opportunity to showcase funded research on-farm and in-field. Several industry groups enjoyed guided tours and demonstrations, seeing first-hand the added capacity made possible by the Hub.

From top: Joseph Sanford, an assistant professor at UW–Platteville, speaks to Rep. Dave Maxey during a poster session at the State Capitol. Middle: Hub posters at the annual Professional Dairy Producers conference. Bottom: 77th Alice in Dairyland Halei Heinzel explores a cannulated cow at UW–Madison's Dairy Cattle Center on a Hub-sponsored tour. Photos by Maria Woldt/Dairy Innovation Hub

AWARD LISTING

FY 25 funding decisions by priority area

Awards in this section were selected by panels of faculty colleagues through a competitive proposal process where faculty and staff submitted a research idea, budget, and justification.

Stewarding land and water resources

UW–Madison

Graduate student assistantships

- A collaborative initiative for continuous groundwater nitrate monitoring in western Wisconsin leveraging legacy well data and novel sensing technologies – Jingyi Huang, Department of Soil and Environmental Sciences; Jill Coleman-Wasik, Department of Plant and Earth Science (UW–River Falls). Student: Sharar Muhtasim

Research support

- Reducing nitrate leaching from dairy manure in corn silage systems – Xia Zhu-Barker, Department of Soil and Environmental Sciences. Student: Joshua Mirabella

Equipment

- Upgrades and repairs to the Kemper C2200 mounted forage harvester for research plots – Gregg Sanford, Department of Soil and Environmental Sciences

UW–Platteville

Faculty research fellowships

- Evaluating nitrogen availability from solid-liquid-separated and composted manure: phase two – Joseph Sanford, School of Agriculture
- Impact of biochar on composting dairy manure and soil health: a comparative study – Joseph Sanford, School of Agriculture

Equipment

- Expanded instrumentation for monitoring permanent pasture water quality and soil health – Dennis Busch, Pioneer Farm
- Enhancing manure management and agricultural research capacity through manure tanker equipment acquisition – Joseph Sanford, School of Agriculture
- Enhancing manure management and agricultural research capacity through investment in manure mesocosms – Joseph Sanford, School of Agriculture

UW–River Falls

Faculty research fellowships

- Understanding groundwater contamination and mitigation strategies in Wisconsin agriculture – Jill Coleman-Wasik, Department of Plant and Earth Science

Equipment

- Building water monitoring infrastructure at Mann Valley Farm – Bahareh Hassanpour, Department of Plant and Earth Science
- Obtaining a fraction collector for water sampling from soil leachate and flow-through reactors – Bahareh Hassanpour, Department of Plant and Earth Science
- Vertical tillage tool for Mann Valley Farm, research and teaching – Duane Thompson, Mann Valley Farm

Growing farm business and community

UW–Madison

Graduate student assistantships

- Fluidized bed drying (FBD) vs. spray drying (SD) of liquid whey protein phospholipid concentrate (WPPC): oxidative shelf-life, in-vitro digestion, and therapeutic potential – Mark Richards, Department of Animal and Dairy Sciences. Student: Crystal Qing
- Development of analytical modeling tools to assess changes to milk pricing under Federal Milk Marketing Orders – Victor Cabrera, Department of Animal and Dairy Sciences. Student: Jack Myers
- Engineering beyond the brown midrib phenotype: using tissue- and cell-type specific engineering to improve the agronomic traits of digestible brown midrib maize mutants – Rebecca Smith, Department of Plant and Agroecosystem Sciences. Student: Jane Wernow

UW–Platteville

Faculty research fellowships

- Lab to land: testing the efficacy of plant essential oils for the management of aphanomyces root rot of alfalfa in the field – Muthu Venkateshwaran, School of Agriculture
- Leveraging blockchain for data security in the dairy farm – phase 2 – Yanwei Wu, computer science and software engineering

Equipment

- Integrated data framework for Pioneer Farm: enhancing analytics and security – Xiaoguang Ma, electrical and computer engineering

UW–River Falls

Faculty research fellowships

- Feasibility assessment for establishing a Choice and Sensory Evaluation Lab (CSEL) at UW–River Falls – Md Azhar Uddin, Department of Agricultural Economics
- Further development of Dairy Forage Fractionation (DFF) equipment – Bob Zeng, Department of Agricultural Engineering Technology

Equipment

- Acquisition of a grinder-mixer to process high oleic soybeans – Duane Thompson, Mann Valley Farm

Ensuring animal health and welfare

UW–Madison

Graduate student assistantships

- Genomic solutions to reduce fetal loss in dairy cattle – Francisco Peñagaricano, Department of Animal and Dairy Sciences. Student: Agustín Chasco
- The antimicrobial dilemma: exploring the effects of prophylactic antimicrobials on microbial colonization and immune development in dairy calves – Lautaro Rostoll Cangiano, Department of Animal and Dairy Sciences. Student: Trinidad Fernández Wallace
- Evaluating novel dietary strategies to enhance nitrogen utilization efficiency in dairy cows – Yun Jiang, Department of Animal and Dairy Sciences. Student: Houhua Hu

Equipment

- Förster-Technik CalfRail System – Lautaro Rostoll Cangiano, Department of Animal and Dairy Sciences

UW–Platteville

Faculty research fellowships

- Increasing nutritional density of alfalfa through the application of locally-sourced effective microorganisms – Rich Crow, School of Agriculture

Equipment

- Demonstration feed mill – Pete Lammers, School of Agriculture

UW–River Falls

Faculty research fellowships

- Management and housing practices related to bulk tank milk butterfat and protein concentration in Wisconsin dairy herds – Maria Jose Fuenzalida, Department of Animal and Food Sciences

Equipment

- Ultracentrifuge enhances research capacity within Dairy Innovation Hub and teaching opportunities for UW-River Falls – Maria Jose Fuenzalida, Department of Animal and Food Sciences

Enriching human health and nutrition

UW–Madison

Graduate student assistantships

- Assessing the functionality of a promising new dairy ingredient (WPPC) on the health of post-menopausal women – Bradley Bolling, Department of Food Science. Student: Kevin Shih

UW–Platteville

Faculty research fellowships

- Improving the growth of alfalfa with plasma activated water: a potential eco-friendly pesticide – Zifan Wan, School of Agriculture

Equipment

- Enhancing plasma technology for food safety and sustainability via high-frequency power supply, advanced plasma reactor, and large-scale plasma-activated water system – Zifan Wan, School of Agriculture

UW–River Falls

- *No awards in this area in FY 25*

Scan QR code to access the fully searchable "Project Showcase" database.
Left: attendees explore Pioneer Farm during the Hub's summer research showcase.
Photo by Nguyen Tran/Dairy Innovation Hub

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