



# ANNUAL REPORT 2022

REFLECTING ACTIVITIES  
from July 1, 2021 - June 30, 2022





*Harnessing research and development for Wisconsin's dairy community.*

**On the cover:** Max Siragusa is a crop and soil science student at UW-Platteville. As part of Joseph Sanford's course on nutrient management, he uses a thermometer to observe the temperature of a manure compost windrow at Pioneer Farm. Compost should be turned a minimum of five times within a 15-day period, along with maintaining a temperature between 131 and 170 degrees Fahrenheit. Composted manure is gaining popularity as an economical and sustainable way to handle dairy manure. See story on p. 46. Photo by Andy McNeill/UW-Platteville

**Above:** Jimena Laporta is an assistant professor in animal and dairy sciences at UW-Madison. Her Hub-funded research examines heat stress in dairy calves housed in outdoor hutch environments. See story on p. 44. Photo by Michael P. King/UW-Madison CALS

# WELCOME TO OUR FISCAL YEAR 2022 ANNUAL REPORT

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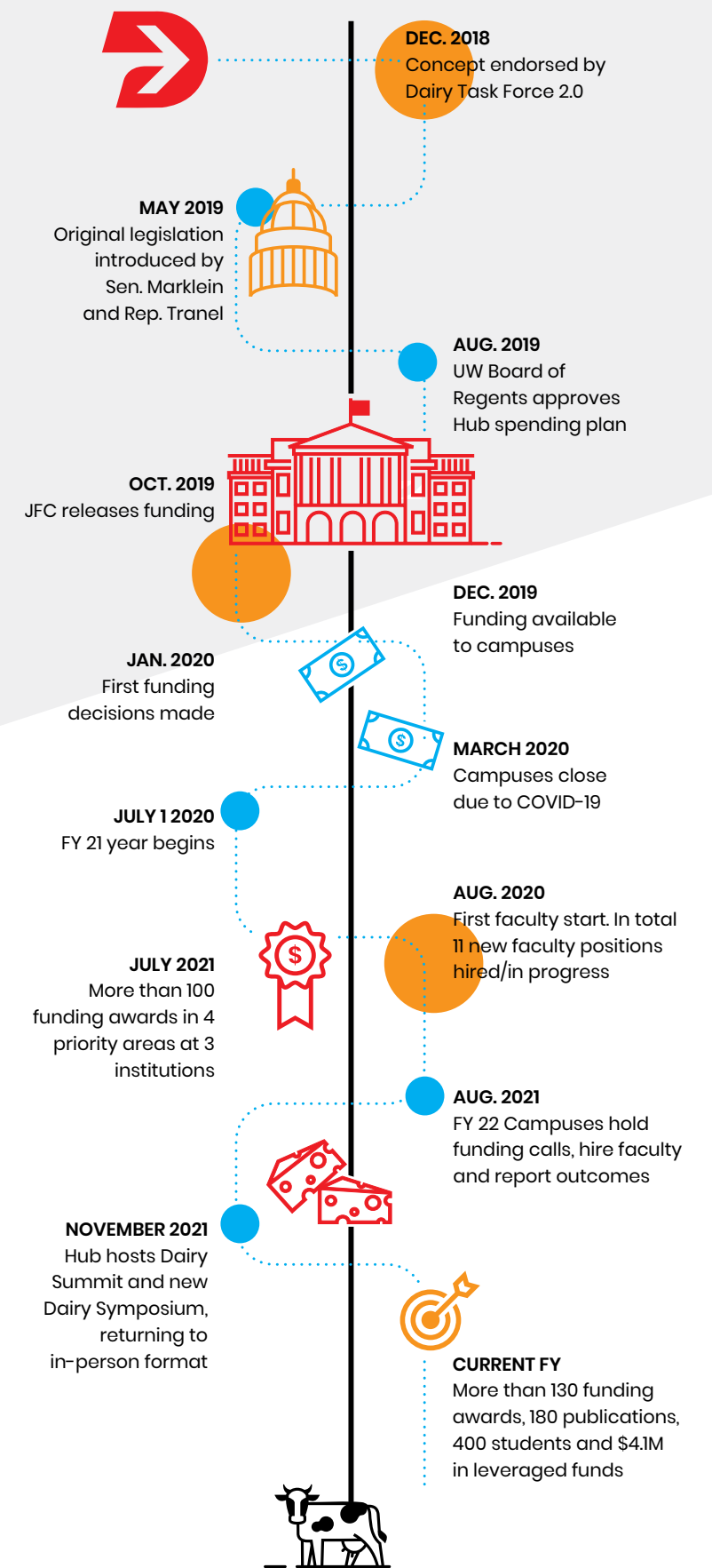
# OUR STORY

The Dairy Innovation Hub concept 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 UW System 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 three years, the Hub created mechanisms to manage the investment, funded more than 130 proposals and managed 15 faculty searches. The first Hub-funded faculty started in FY 21. In FY 22, eight faculty began their new roles, and the remaining five start in FY 23. The accomplishments listed herein are the result of data collected from funding recipients to track progress and accountability.

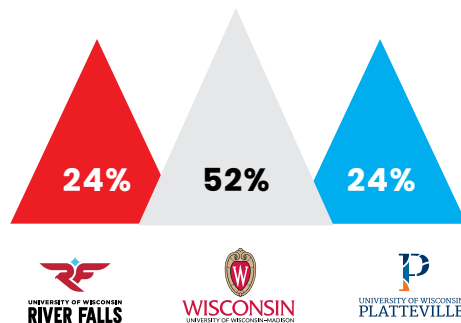
**THE DAIRY INNOVATION HUB** represents a \$7.8 million per year investment by the State of Wisconsin that harnesses research and development at UW-Madison, UW-Platteville and UW-River Falls campuses to keep Wisconsin's \$45.6 billion dairy community at the global forefront in producing nutritious dairy foods in an economically, environmentally and socially sustainable manner.



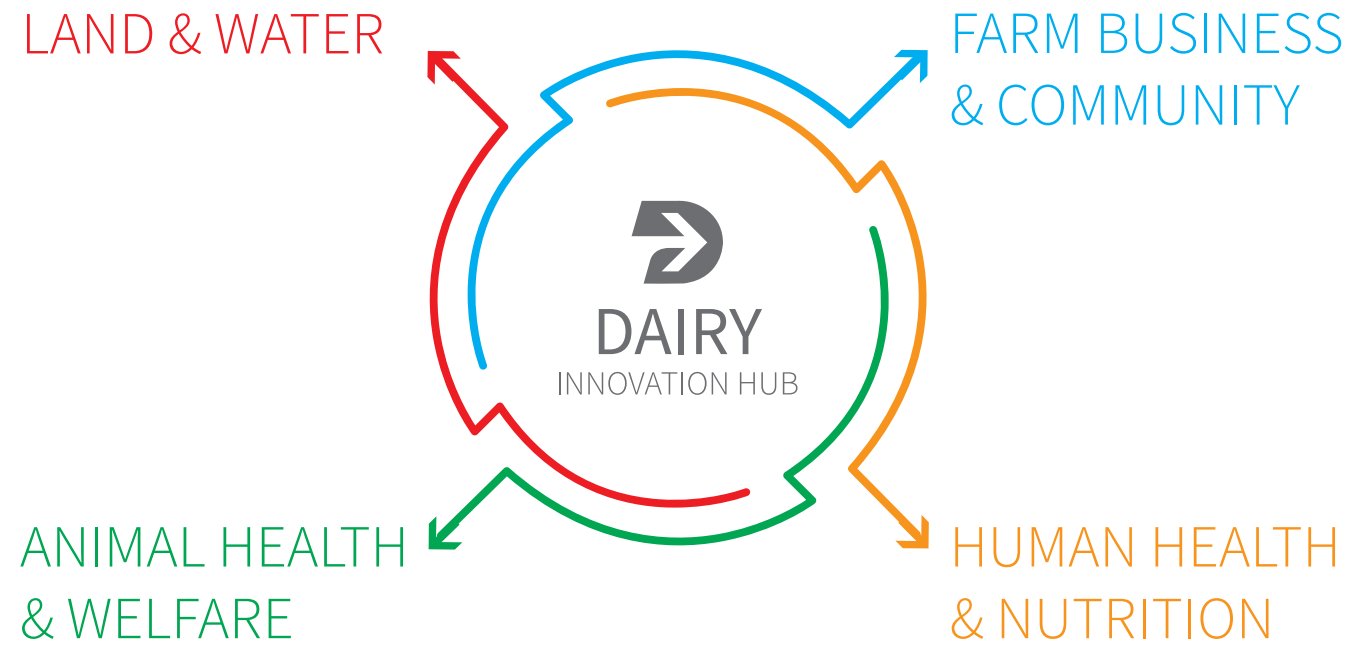
# HOW DID WE GET HERE?

Above: On May 1, 2019, a public hearing marked the introduction of Senate Bill 186 that would create the Dairy Innovation Hub. The three deans, stakeholders, and elected officials spoke about the importance of a research-focused initiative dedicated to advancing Wisconsin's dairy community. Photo by Wisconsin Cheese Makers Association

STATE INVESTMENT  
**\$7.8M**  
PER YEAR



## FOUR KEY PRIORITY AREAS



### **Stewarding land and water resources**

Reduce water use; improve soil health; improve air quality & limit use of land resources; develop alternative uses and markets for manure; and minimize nutrient losses to lakes and rivers.

### **Enriching human health and nutrition**

Limit risk of food-borne illnesses; reduce obesity & preventable health problems; create lactose-intolerant & allergy-free alternatives; improve the nutritional value of milk & meat; minimize pathogen risks in soil & water; and design packaging for convenience & shelf life.

### **Ensuring animal health and welfare**

Find effective alternatives to antibiotics; monitor animal health with sensor technologies; improve reproductive rates & replacement policies; reduce animal stress & enhance consumer trust; minimize risk of disease from animal contact; and deploy genomic selection for healthy animals.

### **Growing farm businesses and communities**

Establish agricultural technology start-ups; use big data to optimize dairy farms; market specialty milk & meat products; develop skilled & tech-savvy rural workforce; improve financial literacy & return on assets; and understand supply chains, global markets and areas of opportunity.

## 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.





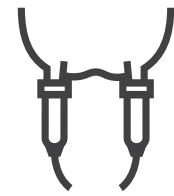


# WISCONSIN DAIRY STATS

**6,275**  
DAIRY FARMS  
(as of Sept. 1, 2022)



more farms than  
any other state



**31.7**  
BILLION  
pounds of milk  
produced annually

EVERY



IN WISCONSIN GENERATES  
**\$36,000**  
in economic activity per year.



**1,274,000**



COWS

*That's almost half  
as many as 1950!*



**1<sup>ST</sup> NATIONALLY**  
in cheese  
production



**2<sup>ND</sup> NATIONALLY**  
in milk  
production



**157K JOBS**

in Wisconsin are dairy farming  
or processing related

**\$45.6**  
BILLION

in economic activity to the  
state of Wisconsin



## FROM THE DIRECTOR

### Heather White

Faculty Director | Dairy Innovation Hub

Having positive impact on the dairy community is what the Hub set out to do three years ago. Now, as we reflect upon the last year, and the cumulative three years, that impact is becoming visible in several different ways. Through faculty hires, training and educating students, funding innovative research, and prioritizing collaboration and communication, we are ensuring that Wisconsin remains strong and at the forefront of the dairy community.

By recruiting faculty to build their research and teaching programs in Wisconsin, we create the critical mass that can be responsive to challenges that the dairy community faces – from farm economics to food safety to animal biology and beyond. We also position ourselves to be competitive for student recruitment and external research funding, providing what our students and stakeholders need. To date, the Hub has hired 15 new research and teaching faculty with focus across the priority areas.

These faculty are housed across UW–Madison, UW–Platteville, and UW–River Falls. By infusing faculty focused on the Hub priority areas into departments that match their discipline, we are not only funding faculty that can address the critical gaps and key research challenge areas identified by the Hub, but we are also creating partnerships and synergies with existing department colleagues.

It is exciting to watch these faculty dive into dairy-related research and bring new critical mass to our teaching and outreach efforts. Their talent and dedication is already apparent as they are bringing in federal and private grant funding, even in their first 1–2 years on campus. We have no doubt that bringing top-talent to our campuses through Hub-funded faculty hires will have long-lasting impacts on research, teaching, and outreach capacity.

While Hub-funded faculty represent an exciting and impactful product of the Hub, they are not the only source of innovative research. All three campuses continue to fund postdoctoral researchers, graduate students, and research projects with current faculty. Funding for these projects continues to be competitive, with more great ideas each cycle than can be supported. Input from external stakeholders, along with scientific peer review, helps ensure that funding is allocated to innovative and relevant projects.

These projects are exploring novel ways to use dairy products, harness the nutrients traditionally considered “waste products” on-farm or during processing, as well as prioritizing and improving the health and welfare of animals and consumers. In addition to the scientific results of these projects, a key deliverable is also the students that are trained and enter careers in the dairy industry or continue to pursue higher education. We are continually impressed with the quality of the students and their successes when pursuing their next steps.

A continued focus of the Hub has been collaboration and communication. We are seeing new collaborations built daily, between researchers within and across our three campuses and together with stakeholders across the state. It is this collaborative nature that is at the heart of the Wisconsin Idea, and apparent in Hub research, teaching, and outreach. We showcase this ground-breaking work at our free, public, Dairy Summit and Dairy Symposium events and at other outreach opportunities during the year. These collaborations yield stronger science, more innovative approaches, and ensure relevant solutions.

*Heather White*

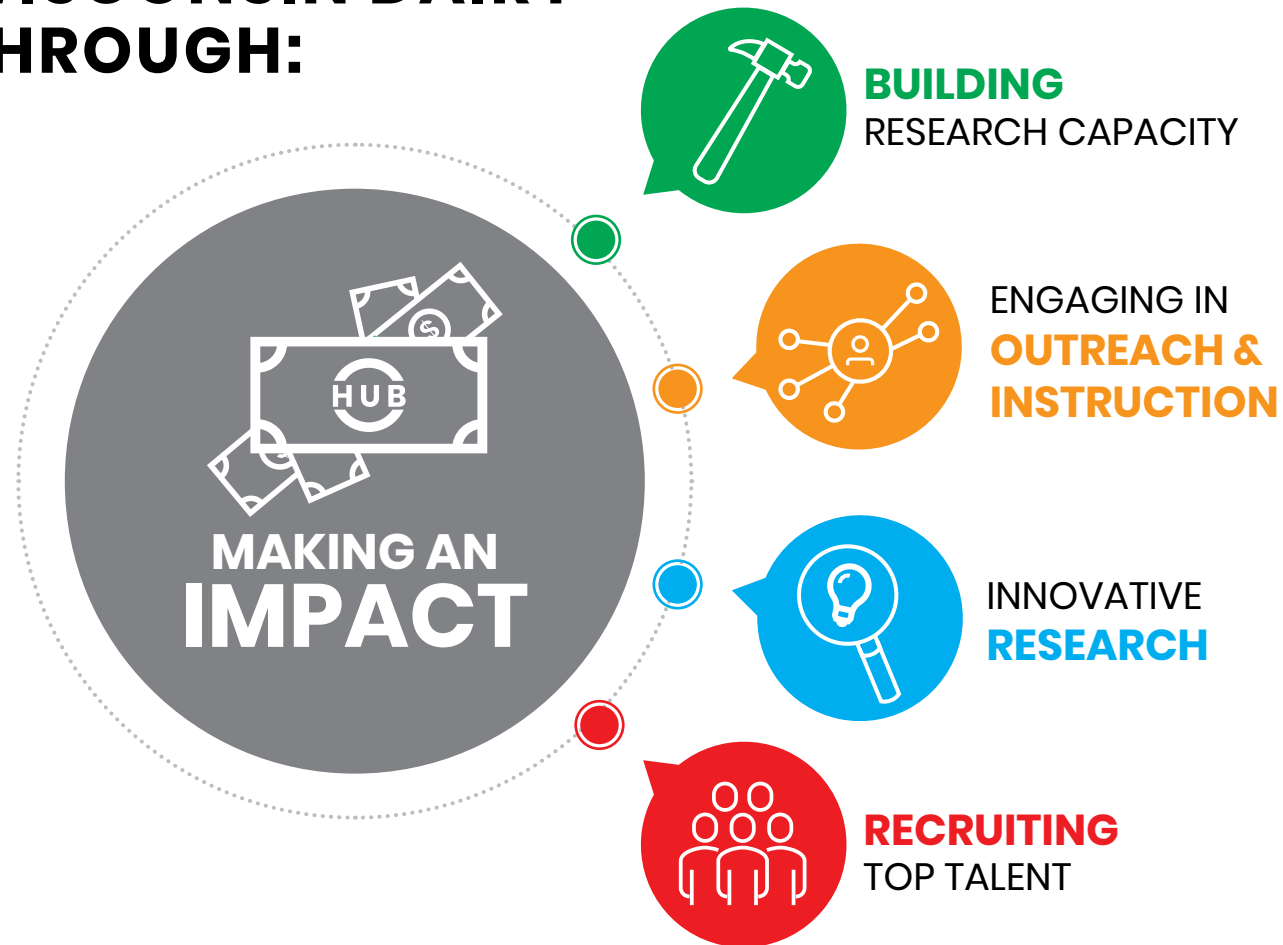
“

*By recruiting faculty to build their research and teaching programs in Wisconsin, we create the critical mass that can respond to the dairy community’s challenges*

”



# HUB DOLLARS IMPACT WISCONSIN DAIRY THROUGH:



## Why is research and training so important?



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

# ACCOMPLISHMENTS TO DATE

More than **130+** **PROJECTS FUNDED** across 3 campuses and 4 priority areas

**15 FACULTY SEARCHES** attracting top talent to Wisconsin

**\$4.1 MILLION IN LEVERAGED GRANT FUNDS**

**183 JOURNAL PUBLICATIONS** published or in progress

**421 STUDENTS** engaged in Hub research & infrastructure

**291 PRESENTATIONS** to live audiences

# WHO BENEFITS FROM THIS RESEARCH?





## OUR LEADERSHIP



### Kathryn VandenBosch

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

Here at UW-Madison, a major activity this past year has been the selection of a new dean for the College of Agricultural and Life Sciences (CALs). In August, I was pleased to pass the baton to Glenda Gillaspy, a biochemist who comes from Virginia Tech. Dean Gillaspy has been introduced to the Dairy Innovation Hub, and I know she looks forward to gaining first-hand knowledge of the Hub's participants, activities, stakeholders, and impact.

Reflecting on my decade as dean, being involved in the launch of the Dairy Innovation Hub has been a privilege and a source of pride. In just three years,

the Hub has grown research capacity and created a vibrant, multi-disciplinary community across its four areas of emphasis: Land and Water, Farm Business and Community, Animal Health and Welfare, and Human Health and Nutrition. In CALs, so far we have recruited seven new faculty across these quadrants. The Hub fosters their interactions with their Platteville and River Falls counterparts and with established researchers. What a great training environment this provides for the students and post-docs we are recruiting! The Hub is an exemplar for the Wisconsin Idea – that UW should have impact throughout the state, and beyond. It has supported many projects designed to be applied quickly, to have an impact on dairy in the near-term. And Hub-funded projects are already attracting additional support to Wisconsin from other private and public sources.

I am grateful for the advocacy and advice of the many stakeholders of the hub that have brought us to this point. I know that this community is eager to acquaint Dean Gillaspy with Wisconsin agriculture and food industries, and to work with her to continue to plan the future. Please join me in welcoming her.



From left: Kate VandenBosch, Wayne Weber, and Dale Gallenberg, discuss the impact of the initial \$8.8 million Dairy Innovation Hub investment at a 2019 news conference at Four Cubs Farm in Grantsburg, Wis. Photo by UW System



### Charles Steiner

Interim Dean, College of Business, Industry, Life Science & Agriculture, UW-Platteville

I'm excited to serve as interim Dean of BILSA as UW-Platteville conducts a national search for Chancellor that has necessitated several leadership changes on campus. As Director of UW-Platteville Pioneer Farm the past 11 years, I have been actively involved in the Dairy Innovation Hub since its inception and look forward to my continued involvement in this new role.

Collaboration and capacity building within the Hub are two central themes that have resonated with me over the past three years. The opportunities to collaborate

across colleges on our campus, with colleagues at UW-Madison and UW-River Falls, and with the Wisconsin dairy community have driven our investments, research, and outreach activity.

Capacity building continues at UW-Platteville Pioneer Farm and in our campus laboratories. We completed our first year in operation with two Lely Astronaut A5 robotic milkers and have conducted several Hub research projects utilizing the robots.

This past year we hired Dr. Zifan Wan, an assistant professor specializing in dairy food science and management who is focusing on dairy food product development to support local farmers and processors. We also hired Natalie Jozik as a dairy enterprise research technician at Pioneer Farm to assist with both Hub research activity and training of our students. These two hires have already made a positive impact on our mission.



### Dale Gallenberg

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

This past year was one of great activity at UW-River Falls. Four new faculty joined our ranks, with two in animal and food science and one in the agricultural economics, each fully funded through the Hub. The fourth position is split between plant and earth science and agricultural engineering technology, and funded 50 percent by the Hub. The activities of these faculty, along with an additional hire starting in Fall 2022, will be based in all four priority areas of the Hub.

Research capacity continued to expand through funding of faculty research fellowships which allow current faculty to better engage in research important to

the Hub's overall goals. Faculty research fellowships will continue to be a critical component at UW-River Falls.

Equipment purchases and facility improvement also contributed to increased research capacity. This was true both in laboratories on campus (including analytical equipment and space improvements) as well as at our dairy facility at the Mann Valley Farm (which benefited from updates in cattle housing and other research spaces). Hub funds continue to positively impact the quantity and quality of research spaces on campus.

We appreciate the support and opportunities provided through this funding and look forward to continued work on addressing the issues within the Wisconsin dairy community.





# ADVISORY COUNCIL



“As we report the progress in year three, ‘remarkable’ is the word that comes to mind. The faculty and infrastructure funded by the Hub are beginning to show the fruits of this investment. The progress made at each campus has been very inspiring to see. This past year there were 100 different research projects funded by the Hub. None of these would have occurred without the investment in the Hub. Of course we are well past that now and continue to grow. The future of dairy will be directly impacted by the results coming from Wisconsin. This was the vision we had several years ago as this idea was being built.”

## Mitch Breunig

Mystic Valley Dairy | Dairy Business Association | chairman

### COUNCIL MEMBERS:



**Dave Daniels**  
Mighty Grand Dairy,  
Wisconsin Farm  
Bureau Federation



**Aric Dieter**  
Landmark Services  
Cooperative,  
Dairy Business Association



**Steve Kelm**  
UW–River Falls



**Shelly Mayer**  
Professional Dairy Producers  
of Wisconsin



**Tera Montgomery**  
UW–Platteville



**Scott Rankin**  
UW–Madison



**Rami Reddy**  
UW–Platteville



**Randy Romanski**  
Department of Agriculture,  
Trade & Consumer  
Protection



**John Umhoefer**  
Wisconsin Cheese  
Makers Association



**Kent Weigel**  
UW–Madison



**Heather White**  
faculty director (ex officio)



# CAMPUS UPDATES

## UW–Madison FY 22 accomplishments:

- » Seven new postdoctoral fellowships awarded
- » Ten new awards for short-term, high-impact research projects; Ongoing funding for 13 projects selected in FY 21
- » Recruited three faculty positions: dairy food science, land and water stewardship, immunology
- » Ongoing funding for seven postdoctoral fellowships selected in FY 20
- » Ongoing funding for six graduate student assistantships, including two for collaboratively mentored students from UW–Platteville and UW–River Falls

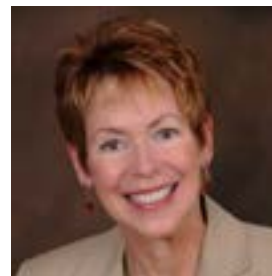
### Steering committee:



**Victor Cabrera**  
Animal and Dairy Sciences



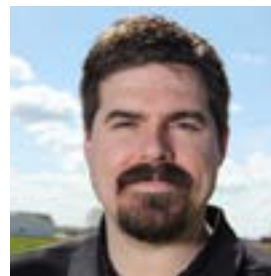
**Paul Mitchell**  
Agricultural and Applied Economics



**Denise Ney**  
Nutritional Sciences



**Scott Rankin**  
Food Science



**Matt Ruark**  
Soil Science



**Troy Runge**  
Biological Systems Engineering



**Kent Weigel**  
Animal and Dairy Sciences



**Heather White**  
Animal and Dairy Sciences



**Heidi Zoerb**  
CALs External Relations

## UW–Platteville FY 22 accomplishments:

- » One new assistant professor joined the faculty in the area of dairy food science and management
- » Recruited postdoctoral teaching scholar in the area of environment and society
- » Hired and onboarded a dairy research technician at Pioneer Farm
- » Five new awards for faculty research fellowships; Ongoing funding for six projects selected in FY 21
- » Six new awards for supplies and equipment
- » Support for graduate student assistantship co-mentored with UW–Madison

### Steering committee:



**Tera Montgomery**  
Animal Science



**Rami Reddy**  
director, School of Agriculture



**Kevin Bernhardt**  
Agribusiness; Center for Dairy Profitability



**Chuck Steiner**  
director, Pioneer Farm  
interim BILSA dean



**Krista Hardyman**  
Animal Science



**Austin Polebitski**  
Civil and Environmental Engineering





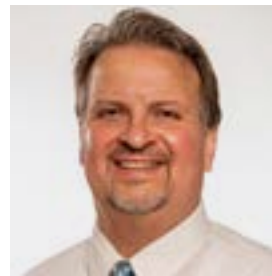


# CAMPUS UPDATES (continued)

## UW–River Falls FY 22 accomplishments:

- » Four new awards for faculty research fellowships; Ongoing funding for four projects funded in FY 21
- » Recruited two faculty positions: atmospheric science and climate resiliency and agricultural water management
- » Nine new awards for supplies and equipment
- » Ongoing support for graduate student assistantship co-mentored with UW–Madison
- » Planning for dairy pilot plant capitol project

## Steering committee



**Steve Kelm**  
Animal and Food Science



**Peter Rayne**  
Animal and Food Science



**Joel Peterson**  
Agricultural Engineering  
Technology



**Holly Dolliver**  
Plant and Earth Science



**Brenda Boetel**  
Agricultural Economics



Above: Arquimides Reyes and student researcher Luke Geist (right) observe dairy-beef cross cattle at UW–River Falls. Read about Reyes’ study spanning multiple generations of dairy, beef, and crossbred animals on p. 50. Photo by Pat Deninger/UW–River Falls

## OUR PARTNERS



### Amy Penterman

President | Dairy Business Association

“By investing in the Dairy Innovation Hub, we are not only driving solutions to move dairy forward but attracting industry-leading talent to Wisconsin, backing our claim as America’s Dairyland and proving our status as a world leader in dairy innovation. The Hub’s broad-based research — from nutrition and animal health to natural resources and economics — will continue to strengthen our rural communities and secure our food systems and dairy’s future.”



### Shelly Mayer

Executive Director | Professional Dairy Producers of Wisconsin

“When much of the world was pulling in the reins due to the uncertainty caused by the COVID-19 pandemic, the thought leaders behind the Dairy Innovation Hub plowed full-steam ahead. Thanks to their vision and pursuit of innovation, leaders in dairy worked relentlessly to ensure Wisconsin’s place in history by bolstering our state’s three agricultural universities with the funding and faculty necessary to support ongoing research. Its far-reaching impacts have proven that the Hub is an undisputed leader for new research and applied science.”



### Randy Romanski

Secretary | Wisconsin Department of Agriculture, Trade and Consumer Protection

“In the past year, Governor Evers has made substantial investments in the Wisconsin Initiative for Agricultural Exports to strategically boost the export of agricultural goods, including dairy, from our state. The research of the Dairy Innovation Hub is essential to meet Wisconsin’s goals to develop innovative products, expand into new markets, and advance our production methods. The Dairy Innovation Hub’s research will continue to move Wisconsin’s dairy industry forward into the future, ultimately benefiting the state’s farmers, processors, and agribusinesses as well as consumers from around the world.”



### Kevin Krenz

President | Wisconsin Farm Bureau Federation

“The Dairy Innovation Hub’s key priorities consider current industry needs that help develop the talent and science necessary to keep dairy farming in Wisconsin strong for generations. The training and research being done by the Dairy Innovation Hub positions our farmers for economic, environmental and social success years down the road. We are proud of the Dairy Innovation Hub’s initiative to keep our dairy farms nationally competitive while strengthening rural communities right here in Wisconsin.”



### John Umhoefer

Executive Director | Wisconsin Cheese Makers Association

“The Dairy Innovation Hub is a catalyst for cooperation between agricultural universities in Wisconsin, and the inspiration for creative ideas to address challenges at the farm level and improve the welfare and production of dairy cows. Additional research is building on the nutrition, safety and quality of dairy foods. The Hub brings together new researchers and fresh ideas for the next generation of our growing dairy industry.”



## NEW FACULTY PROFILE



### Kate Creutzinger

assistant professor | Animal and Food Science  
UW–River Falls | start date Aug. 2021

#### What is your hometown?

I grew up in Mason, Ohio which is just north of Cincinnati. Cincinnati is specifically known for its ice cream, including

always loved working with cattle, and I dabbled in a lot of areas until I found behavior and welfare. I immediately connected to the study of understanding animals through behavioral outcomes. I was introduced to Katy Proudfoot, who later was my PhD supervisor. I watched a video for a project looking at dairy cows' use of mechanical brushes and the rest is history.

#### What are the goals of your current research program?

My goal is to improve the quality of life for dairy cows and calves. A large theme of my research is to understand maternal behavior. This includes behavior prior to and during calving, and maternal behavior directed towards calves after giving birth. Every dairy cow gives birth approximately once per year to initiate lactation for milk production. My research has found that indoor-housed cows have retained the motivation to seclude from other cows at calving like they would in semi-natural settings. We lack basic knowledge to understand cows' motivated behaviors after calving which I hope to address. The other major theme of my research is focused on surplus dairy calves. Approximately half of all dairy calves are unsuitable for dairy production, they are males or are excess to the needs for lactating herd replacements. The calves not used for the dairy are raised for veal or dairy-beef and face many welfare challenges within the first few days to months of life that still need to be addressed in the dairy industry.

#### What attracted you to UW–River Falls and the Dairy Innovation Hub?

For someone in dairy, there is nothing better than working in America's Dairyland. At UW–River Falls, the faculty have a sense of pride for the campus and community.

Graeters and United Dairy Farmers, Skyline Chili, and is the home of the flying pig. There are painted statues of pigs around the city.

#### What is your educational and professional background?

My graduate degrees are both focused on animal welfare and behavior. In my master's degree at University of Saskatchewan, I worked to see if cortisol deposited in hair could be used as a measure of long-term stress in beef cattle. After I finished my master's degree, I worked as a research assistant in swine welfare. We covered a variety of topics including group sow housing, painful procedures in piglets, and long-distance transportation. I then completed my PhD at The Ohio State University where my research focused on maternal behavior and transition health of dairy cows housed in group maternity pens. Research with transition cow health and behavior is what has inspired my current research focus. Following the completion of my PhD, I was a postdoctoral fellow at the University of Guelph. While at Guelph we performed a large study investigating the impact of long-distance transportation on the health and welfare of surplus dairy calves.

#### How did you get into your field of research?

As a 4-H participant and undergraduate student I



Another unique factor is how close our farms are to main campus. Being able to access the dairy so easily creates a considerable strength for teaching to provides the undergraduate students a rich, hands-on experience but it also allows us to have interactive research programs.

The formation of the Dairy Innovation Hub shows a strong commitment to the dairy community in Wisconsin and collaboration across UW campuses. The cross campus collaboration allows us to get to know individuals at other campuses that we wouldn't have been able to know otherwise. There are such interesting projects across the campuses, and I love having the opportunity to learn about them at the Dairy Summit and other meetings.

#### What's one thing you hope students who take a class with you will come away with?

If there is one thing my students take away from my class, I hope it's a curiosity for new ideas that interest them. When students ask me a question and I don't have the answer, my response is usually, "I don't know but let's find out". By introducing new concepts and emerging research I hope my students feel inspired to ask questions and explore their curiosity.

#### What are your hobbies and other interests?

Outside of work I really enjoy spending time with my family

and dogs, Braxton and Elsa. We try to spend time outside either hiking in the summer or cross-country skiing. I am also a novice baker (finding inspiration by the Great British Baking Show) and have started gardening. I'm really enjoying learning about native Wisconsin plants that attract regional birds and insects.



*Creutzinger has several projects in progress relating to improved animal welfare for dairy cattle, beginning with neonate calves through lactating cows. Her most recent faculty fellowship seeks to characterize cow and calf behaviors after calving in a semi-natural setting and in common management settings. The goal of this project is to use natural and semi-natural behaviors to help identify and inform shortcomings in common early lactation management that can be addressed to improve cow welfare. Photos by Pat Deninger/UW–River Falls*



## NEW FACULTY PROFILE



### Margaret Kalcic

associate professor | Biological Systems Engineering  
UW–Madison | start date Jan. 2022

#### What is your hometown?

I grew up in western Massachusetts, in the foothills of the Berkshire Mountains (part of the Appalachians) and in

the Connecticut River Valley, which houses a small, diverse agricultural industry.

#### What is your educational and professional background, including your previous position?

After obtaining an undergraduate degree in engineering from Olin College, outside Boston, I relocated to the Midwest for graduate school at Purdue University, and began my tour of Midwest Big Ten universities. I studied ecological engineering at Purdue, housed in the Agricultural and Biological Engineering department. Then I spent three years doing postdoctoral research at University of Michigan, then took a faculty position at Ohio State University in the department of Food, Agricultural, and Biological Engineering. I have loved each city and school, and am now excited to be making Madison my home.

#### How did you get into your field of research?

My primary field of research is watershed modeling and agricultural hydrology. I mainly study movement of nutrients in landscapes, with a focus on understanding and preventing fertilizer and manure export from farmland to nearby waterways. I came into this research area early in graduate school, via an interest in passive treatment of wastewater through constructed wetlands. I have stayed in the Midwest and grown this program because the tools

for predicting agricultural water quality have proved highly responsive to the needs of states and land managers, and I continue to hone these tools to make them more reliable in the regions I've worked.

#### What are the goals of your current research program?

The overall aim of my research program is to increase the adoption of effective agricultural conservation measures to protect water quality and the environment. To increase conservation adoption requires scientific confidence in conservation effectiveness and clear, trusted avenues of communication with land managers. I aim to improve scientific understanding of the effectiveness of conservation measures through monitoring performance in the field and improving the representation of these practices and processes in computer models that are used to scale up conservation effectiveness to watersheds and regions. I encourage conservation adoption by crossing disciplines to make results meaningful and accessible to a broad audience.

#### What attracted you to UW–Madison and the Dairy Innovation Hub?

I love being a part of Midwestern land grant universities, and particularly those located in a state capital, where research can be made readily accessible to decision makers at all levels. I also enjoy the applied focus of the College of Agricultural and Life Sciences and my home department, biological systems engineering. I appreciate Wisconsin's natural beauty and thriving agricultural industries, and hope to conduct research that sustains both into the future.



#### What was your first visit to campus like?

I first visited campus to meet a colleague when I was in town, and enjoyed seeing the building where I now work, as well as the beautiful lakefront nearby.

#### What's one thing you hope students who take a class with you will come away with?

I hope my students gain an appreciation of the complexity of managing natural resources and are motivated to consider environmental issues from multiple angles.

#### Does your work relate to the Wisconsin Idea?

Yes, it does! My aim is to bring knowledge about effective conservation measures to those across the state who manage farmlands and surrounding natural resources. This applied research will educate land and water managers about how to sustain the resources upon which we depend.

#### What are your hobbies and other interests?

I enjoy walking, gardening, music, games, reading for pleasure, and playing with my young children. This article was adapted with permission from UW–Madison CALS



*Kalcic's primary area of expertise is watershed modeling and agricultural hydrology. She helps farmers and stakeholders understand how water and nutrients move through and across landscapes. Above: As part of this work, Kalcic also works to help farmers implement practical solutions to water quality challenges and nutrient loss. Increasing conservation practices relies heavily on clear and trusted methods of communication across disciplines. Photos by Jori Skalitzky/Dairy Innovation Hub and contributed*



## NEW FACULTY PROFILE



### Grace Lewis

assistant professor | Animal and Food Science  
UW–River Falls | start date Aug. 2021

#### What is your hometown?

I grew up in State College, Pennsylvania, which is directly in the center of the state and home to Penn State (We Are!). People always ask if I grew up on a dairy farm, and I did not. I raised chickens growing up.

#### What is your educational and professional background?

I knew I wanted to study food science after high school, and Penn State has a wonderful food science program. I earned a bachelor's degree in food science in 2018. I had already taken some graduate-level classes and started teaching and research during the last years of my undergraduate program which made transitioning into a food science PhD program relatively smooth. It also helped that I absolutely adored my research program and had phenomenal advisors. I earned my PhD from Penn State on August 15, 2021, and I started at UW–River Falls on August 23, 2021. Talk about a busy summer!

#### How did you get into your field of research?

Toward the end of my undergraduate degree, I started in a dairy foods processing and engineering research program with one of my future PhD advisors, Dr. Federico Harte. It was the perfect fit. Most of my research involved using high-pressure jet technology to manipulate the major protein in milk, casein micelles, to improve product functionality. For example, high-pressure jet technology can be used to create a cappuccino with a foam head that lasts several hours. Let's just say, I get overly excited when I talk about milk proteins now (ask my students).

#### What are the goals of your current research program?

In brief, my research program looks to find innovative, value-added applications for dairy food ingredients and waste products. Through processing techniques and processing aids, the various components of dairy foods can be manipulated for use in alternative, human health-based applications. For example, using casein proteins as an encapsulation agent for pharmaceuticals. I currently have collaborative projects researching innovative uses for micellar casein powder, whey protein (with Youngmi Kim, UW–River Falls), and a lactose-derived sweetener (with Rich Hartel and others, UW–Madison), as well as other ideas in the human health arena.

#### What attracted you to UW–River Falls and the Dairy Innovation Hub?

I knew that I was looking for a dairy-related tenure-track position with both a research and teaching component, and I stumbled upon the original job posting. There could not have been a more perfect job posting for me. I researched UW–River Falls, and I fell in love with how agriculturally-focused and student-driven the campus is. It also helps that the location is absolutely beautiful, and the people are amazing.

As for the Dairy Innovation Hub, I am a huge fan of collaboration, and that is one of the main focuses of the Hub. I get to collaborate with other faculty at UW–River Falls, but also at UW–Madison and UW–Platteville. Basically, I am set up for success with such a great network of collaborators. I also appreciate that the Hub is providing financial support to push the dairy industry into the future, which gives me the means to study some really innovative topics.



#### What was your first visit to campus like?

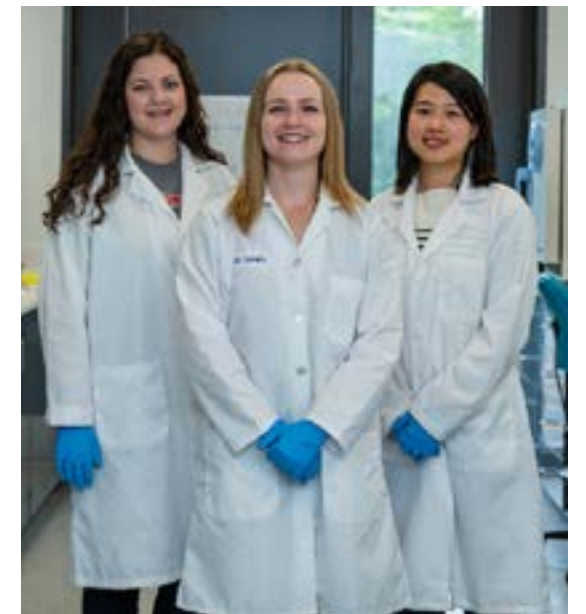
Even though my first visit to campus was at the height of the pandemic and I had a 14-day quarantine post-visit, I knew that I loved River Falls and the surrounding area right away. I had a driving tour of the dairy and horse barns and met many of the faculty. I spent my free time walking around the Kinnickinnic River and sampling cheese curds, so that is hard to beat. Although I had not officially accepted the position at the time, I purchased a lot of River Falls gear to take home to my family because I knew it was where I wanted to be.

#### What's one thing you hope students who take a class with you will come away with?

I want students to have a new respect for how complicated a glass of milk is, and never look at it the same way! I hope they are inspired as they move forward in their careers.

#### Does your work relate to the Wisconsin Idea?

My goal is to teach future professionals not only dairy foods-related knowledge, but also to show them a different perspective and excitement for their career path. I want students to leave my classroom and my lab with confidence in themselves and that they are entering an awesome field.



#### What are your hobbies and other interests?

A week in the summer involves softball on Mondays, volleyball on Wednesdays, and going to my local CrossFit gym on the other days. I also enjoy hiking, gardening, cooking, watching sports (all Pittsburgh and Penn State teams), and being with my family.



*Clockwise: Lewis teaches an undergraduate course in dairy processing and offers student research opportunities in her campus lab. Applying classroom learning to lab research creates a deeper understanding of food science and manufacturing. Above: Lewis tests milk samples using new equipment funded by the Hub. Photos by Pat Deninger/UW–River Falls*



## NEW FACULTY PROFILE



### Hilario Mantovani

assistant professor | Animal and Dairy Sciences  
UW–Madison | start date March 2022

#### What is your hometown?

I grew up in Sao Gabriel da Palha, Southeast Brazil, a small town surrounded by coffee farms.

#### What are the goals of your current research program?

The main goal of my current research is to understand the functions and ecology of anaerobic microbes that colonize the gastrointestinal tract of ruminants. My lab aims to combine 'omic' technologies and classic microbiological approaches to explore the intricacies of the ruminant gut microbiome and develop microbiome-derived agricultural products. This research could lead to the identification of novel bioactive metabolites and microbial strains with desirable physiological traits that could be applied to promote animal health, maximize productivity, improve food safety and reduce the overall environmental impact of livestock production.

#### What attracted you to UW–Madison and the Dairy Innovation Hub?

UW–Madison is internationally recognized for its excellence in teaching and research and has a multicultural work environment. Contemporary science is often characterized by its interdisciplinarity. UW–Madison is home to many scientists that are world leaders in their field of knowledge and the possibilities for collaboration are enormous! In addition, Madison is a great place to live and has amazing natural scenery and delicious cheese!

UW–Madison has a unique research-driven atmosphere and I truly enjoy being part of this community. I hope to develop a research program that will make significant contributions to the field by bringing together a combination of basic and applied research. It is important to highlight that livestock gut microbiomes can be an excellent resource for a variety of industrial and biotechnological purposes.

#### What is your educational and professional background?

I have a BS in agronomy and MS in agricultural microbiology from Federal University of Viçosa (Brazil). I stayed with the university as a lecturer before attending Cornell University for my PhD in microbiology. I then returned to Viçosa as a professor and remained there until my appointment began at UW–Madison. I have more than 20 years of experience in research, teaching, and investigating fundamental and applied questions related to the ecology, physiology, and genetics of rumen microbes and understanding their roles in rumen function, host phenotypes, and food safety.

#### How did you get into your field of research?

I was an undergraduate intern in a microbial physiology lab studying hydrolytic enzymes produced by cellulolytic fungi isolated from cow feces. That experience sparked my interest in studying the complex microbiota that colonizes the gastrointestinal tract of livestock for biotechnological applications. While in graduate school, I focused on the ecological interactions between microbes that inhabit the stomach of cows and sought to develop approaches to manipulate this ecosystem to improve the nutrition and health of the host.



#### What was your first visit to campus like?

I spent a sabbatical year at the U.S. Dairy Forage Research Center located on the UW–Madison Campus. I could experience the vibrant and collaborative research environment of the university and encountered a welcoming and inclusive community. It was such a great experience that I decided to come back!

#### What's one thing you hope students who take a class with you will come away with?

I hope students can appreciate the essential role that microbes play in our everyday lives, particularly in the nutrition and health of their hosts (including humans!). I also hope to induce students to apply and analyze critically what is being taught, thus providing opportunities for them to develop these skills and communicate their ideas.

#### Does your work relate to the Wisconsin Idea?

Livestock gut microbiomes can be explored for industrial and biotechnology purposes, including the development of microbiome-based agricultural products such as novel antimicrobials and live biotherapeutics. The gut microbiome is also linked with host productivity as well as health and disease. There is potential to incorporate the profiling of rumen microbial populations as markers to predict host phenotypic traits (e.g., milk production) or apply specific microbes or their metabolites to improve food safety.

#### What are your hobbies and other interests?

I enjoy spending time with my family and friends, working out, running, reading, watching movies, and listening to music. I also like soccer and plan to start bicycling. *This article was adapted with permission from UW–Madison CALS*



*Clockwise: Mantovani's current research team consists of (From left) Karine Camargo, visiting PhD student; Alice Assumpção, PhD student; and Ana Julia Moreira, MS student. Moreira manipulates mastitis pathogens in the biosafety cabinet located in Mantovani's lab. Mantovani is building a research program in rumen microbial physiology focused on advancing dairy sustainability through improved productivity, feed efficiency, and alternative feed sources. Photos by Jori Skalitzky/Dairy Innovation Hub*



## NEW FACULTY PROFILE



### Chuck Nicholson

associate professor | Agricultural and Applied Economics  
UW–Madison | start date Jan. 2022

#### What is your hometown?

My father was a career Marine Corps officer, so I lived in multiple places in the U.S. growing up. We spent the most time in

the lovely city of San Diego, so I consider it my hometown.

#### What is your educational and professional background, including your previous position?

I have more than 20 years working as an agricultural economist, business analyst and food system modeler. Most recently, prior to joining UW, I worked at three business schools: the Nijmegen School of Management (Netherlands), Cornell University and Penn State University.

#### How did you get into your field of research?

I studied economics as an undergraduate student at UC Davis and got interested in agriculture through experience as a small livestock extension agent with Peace Corps in sub-Saharan Africa. In my PhD program at Cornell, I had the opportunity to work with a top agricultural economist who focused on dairy markets and policy issues and that inspired me to research those ever since. I've since added expertise in food system modeling and supply chains through teaching and industry engagement.

#### What are the goals of your current research program?

UW–Madison is one of the few universities that still has a critical mass in dairy-related research, and the Dairy Innovation Hub is strengthening that with additional faculty hires. The opportunity to contribute to this growing effort is

the reason I came to UW. My main goals are to apply the tools of economics, business and systems modeling to provide information relevant to decision making by dairy stakeholders in Wisconsin and at the national level. I often work with agricultural scientists to inform the research questions and use of methods. I am currently working on projects to examine changing patterns of spatial organization of the US dairy industry, factors affecting the farm-level costs of milk production, the evolution of global dairy markets and how to increase dairy product exports from Wisconsin.

#### What was your first visit to campus like?

I had previously visited UW–Madison multiple times going back nearly 20 years, but one of my favorite memories from a visit a few years ago is of a warm and sunny July afternoon on the Terrace talking with collaborators and one of my PhD students who was at UW for a summer course in Vietnamese.

#### What's one thing you hope students who take a class with you will come away with?

I teach a course on food systems and supply chains, so I want students to have an increased appreciation for the complexity of how we get our food and its broader economic, business, social and environmental impacts. I also have overarching goals that they can think critically, use evidence to support decisions, work well in teams and present effectively.

#### Do you share your expertise and experiences with the public through social media?

I disseminate research in written documents and videos through a dedicated website ([dairymarkets.org](http://dairymarkets.org)), and

through interviews with reporters. I have also used interactive platforms with modeling tools to engage with stakeholder groups.

#### Does your work relate to the Wisconsin Idea?

Some of my dairy-focused work is conducted in collaboration with Wisconsin organizations or input from state government agencies. Often my goal is research that informs decision making and its implications for citizens of Wisconsin. I hope through my instruction to create new opportunities for students that can allow them to make a contribution to Wisconsin's social and economic well-being.

“I want students to have an increased appreciation for the complexity of how we get our food and its broader economic, business, social and environmental impacts.”

#### What's something interesting about your area of expertise that would resonate with the general public?

Saying “Did you know that the price dairy farmers receive for milk depends on its use — in one of four different classes?” probably wouldn't be it! In the systems modeling field we focus a lot on feedback. “Positive feedback is one of the most powerful forces in the universe” — this phrase is something that everyone can understand.

#### What are your hobbies and other interests?

I enjoy running (especially on trails), traveling internationally, brewing beer and reading history. I hope to get more into kayaking and cross-country skiing now that I'm here! *This article was adapted with permission from UW–Madison CALS*



One of Nicholson's current projects investigates export market constraints for small- and medium-sized dairy processors in Wisconsin and strategies to overcome them. Like much of his research, he's incorporating undergraduates by providing an opportunity for five UW system students to address the research questions and enhance their knowledge of strategies to increase dairy product exports. Photo by Jori Skalitzky/Dairy Innovation Hub



## NEW FACULTY PROFILE



### Risper Nyairo

postdoctoral scholar | Environmental Sciences and Society  
UW–Platteville | *start date Aug. 2021*

#### What is your hometown?

I grew up in the highlands of Kisii County, in southwestern Kenya, a region with a vibrant agricultural community.

about my research potentially helping communities, especially those whose livelihood is dependent on natural resources, be better informed to adapt to changing environments.

#### What are the goals of your current research program?

I am tasked with conducting a feasibility study on the potential of linking local producers to campus dining services. The overall aim is to increase local food offerings to the university while promoting sustainable practices within the watershed that would benefit soil and water quality. My first deliverable was to reconstruct the environmental history of the watershed using tools in a Geographic Information System in order to create a baseline of existing practices.

#### What attracted you to UW–Platteville and the Dairy Innovation Hub?

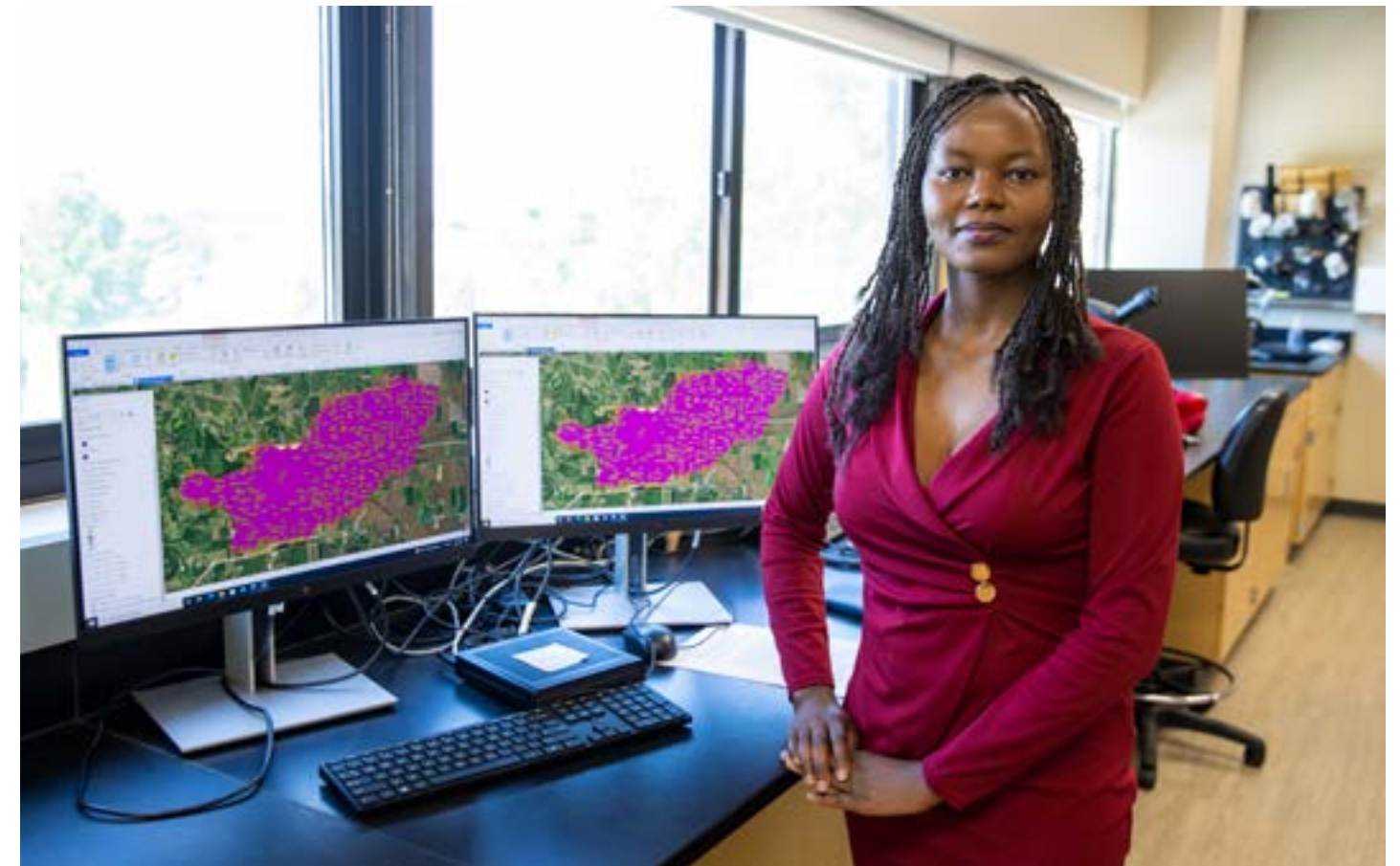
As a person whose study and research have always focused on environmental issues, the Hub's theme on land and water stewardship captured my interest. I felt that I had the knowledge, skills and attitude to meaningfully contribute and be part of a team driving change in Wisconsin. UW–Platteville is undertaking many initiatives to promote sustainability and I share in all the values of the campus as they espouse the three goals of sustainability: Planet, People and Prosperity. Every time I refill my water at the smart water dispenser, I am reminded of the role it plays in conserving our environment. My department of Environmental Sciences and Society is actively developing courses that are aligned with the idea of conservation and my colleagues are the kind of people who walk the talk.

#### What is your educational and professional background, including your previous position?

I hold a PhD in Environmental Engineering from Osaka University, Japan. After my undergraduate degree in management of agro-ecosystems and environment, I took a Masters in agroforestry, both in the University of Nairobi, Kenya. While pursuing my masters, I joined the World Agroforestry Centre as a research fellow and continued to work as a monitoring and evaluation assistant after graduation. I later moved to work as a part-time lecturer at Kisii University and then as a consultant with Africa Waste and Environment Management Centre, before leaving for Japan to pursue doctoral studies. After earning my PhD I spent one year doing postdoctoral research at Ritsumeikan University in Shiga, Japan before moving to Platteville.

#### How did you get into your field of research?

I model environmental systems in order to investigate socio-ecological vulnerability to land use and climatic changes. My interest in this research area was roused when I took a course in sustainable development during my undergraduate study and learned that models can be used to make projections for the future. I was excited



#### What was your first visit to campus like?

My first time on campus was also my first day of work and I enjoyed meeting new people and a short tour of the main buildings with my supervisor. I was glad to have a spacious office.

#### What's one thing you hope students who take a class with you will come away with?

I hope my students will learn that whatever path they take, they are part and parcel of the environment and have a responsibility to care for it. Environmental Sciences and Society is rooted in understanding the sense of place and how our society influences the world around us and beyond. Within that discipline, agriculture has risen as a dynamic area centering on agricultural resources and the relation between people and planet.

#### Does your work relate to the Wisconsin Idea?

My work helps to identify opportunities for betterment of the environment on which we all depend. If a partnership

between land managers and the university is realized, this would be a strategic relationship for the flow of information both ways that would help decision-making, research and improvement to the condition of the environment. It would also be a chance to include groups such as the Amish who are an important part of the watershed and the state but are seldom involved in the discourse on land management.

#### What are your hobbies and other interests?

I love hiking, walking and listening to music. I very much enjoyed lunchtime walks through Memorial Park here on campus in the Spring.

*Above: Nyairo is working on a feasibility study linking local farmers and processors to UW–Platteville dining services. In addition to supporting local food, the project promotes sustainable practices in the surrounding watershed. The local Rountree Branch watershed is a mix of farmland and developed area – including the UW–Platteville campus, shown using GIS on the monitor. Photo by Andy McNeill/UW–Platteville*



## NEW FACULTY PROFILE



### Joseph Pierre

assistant professor | Nutritional Sciences  
UW–Madison | *start date Oct. 2021*

#### What is your hometown?

I grew up in Green Bay and Door County, Wisconsin, a little over two hours northeast of Madison.

Putting all these experiences together, it was a natural next step to bring these experiences and interests back to the field of nutritional sciences.

#### What are the goals of your current research program?

My research program has been centered around understanding the roles of diet, gut physiology, and the microbiome in health and disease. We have existing funding from the National Institutes of Health (NIH) examining the role of diet and bariatric surgery on breast cancer outcomes, the role of the microbiome/mycobiome in inflammatory bowel disease, and how extraintestinal microbial communities (in circulation) shape cardiovascular events. At UW, my program will continue to utilize diverse experimental tools (bariatric surgery, parenteral nutrition, gnotobiotics, microbial sequencing, and enteroids) to gain deeper insights into nutritionally relevant areas — emphasizing dairy components — in the context of disease treatment, prevention and optimizing human health.

#### What attracted you to UW–Madison?

UW–Madison is a research powerhouse with talented faculty colleagues, laboratory resources, core facilities, along with thoughtful and hardworking students and trainees to interact with. If there is a scientific hypothesis worth testing, you can successfully pursue it at the UW.

#### What was your first visit to campus like?

I believe my first ‘visit’ to campus was as a child (my brother was an engineering student), but I remember touring campus as a high school track recruit with then head coach, Ed Nuttycombe. The impression and beauty of this campus never gets old.

#### What is your educational and professional background, including your previous position?

I attended UW–Madison as an undergraduate (BS in natural science) where I was a student athlete in track and cross country from 2005–2008. I then completed a PhD in nutritional sciences through the Interdepartmental graduate Program in Nutritional Sciences (IGPNS) at UW. Following graduation, my postdoctoral fellowship training was in gastroenterology, hepatology, and nutrition at the University of Chicago. Prior to joining the UW faculty, I was most recently an assistant professor of pediatrics, microbiology, immunology, and biochemistry at the University of Tennessee Health Science Center.

#### How did you get into your field of research?

The gastrointestinal tract serves as the largest “external” surface of the body and is tasked with digesting and absorbing nutrients, mediating cohabitation with trillions of microorganisms, and acting at the largest endocrine and immune organ. As I learned more about the many important roles the gut plays in human health, I became more fascinated by how diet and resident microbial communities fundamentally shape metabolic and immune responses in the gut and throughout the body. My fellowship training was focused on the tools and concepts for studying the gut microbiome and host metabolites.



#### What’s one thing you hope students who take a class with you will come away with?

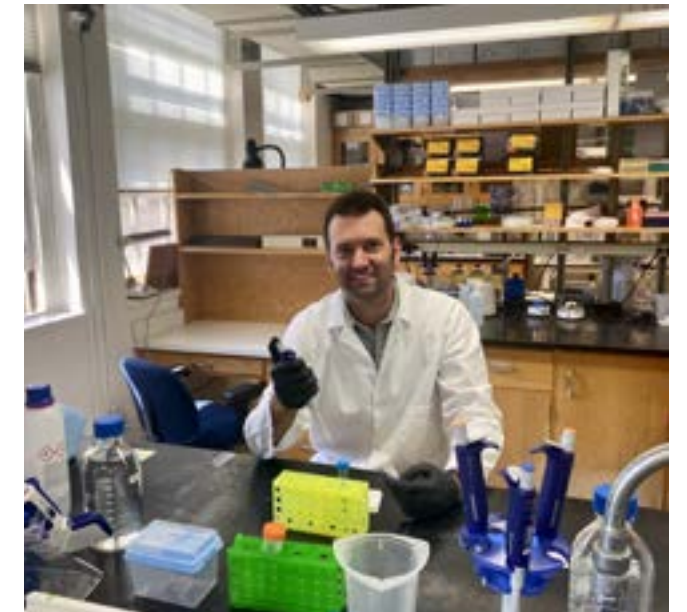
I hope my students are inspired by the materials and concepts and go on to pursue lifelong curiosity outside of the classroom that enriches their lives and professional careers.

#### Does your work relate to the Wisconsin Idea?

Absolutely. The pursuit of basic and translational research knowledge — especially in metabolism, nutrition, and health — benefits the residents of Wisconsin and beyond. More specifically, a key emphasis of my program is gaining deeper insights into the use of dairy components and products in human health and nutrition. Milk is a fundamentally important source of nutrition in mammalian biology. Dairy products contain complete protein, hundreds of bioactive peptides and enzymes, and unique lipids that have been key assets to human agriculture and success for millennia. Beyond human health, dairy is economically important to Wisconsin and many populations around the globe.

#### What’s something interesting about your area of expertise?

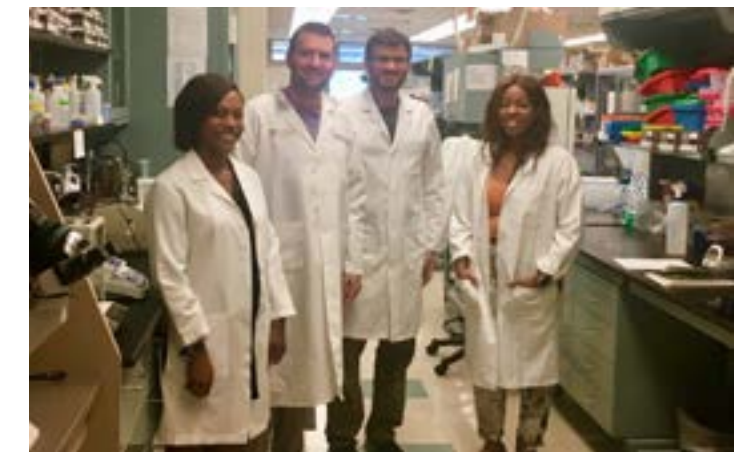
It may sound cliché, but we really are a product of what we eat. Beyond energy, our diets begin an enormously complex cascade of metabolites, microbial adaptation and selection, and host cell and organ system responses



that are fascinating and interconnected in many ways that we’re still trying to understand. Appreciating the catalyzing role of diet synergies with the biochemical, genetic, environmental, lifestyle and microbiological academic pursuits in understanding human biology.

#### What are your hobbies and other interests?

As a father of several young kids, I spend a lot of time at home, with the occasional camping trip or golf outing. *This article was adapted with permission from UW–Madison CALS*



*Clockwise: Pierre started at UW–Madison in October of 2021 and went about the complex job of moving his federally-funded lab from Tennessee to Wisconsin. A Wisconsin native, Pierre brought with him several active research projects supported by the National Institutes of Health (NIH). Photos contributed*



## NEW FACULTY PROFILE



### Luis Peña-Lévano

assistant professor | Agricultural Economics  
UW-River Falls | start date Aug. 2021

#### What is your hometown?

I am from Chinchá Alta, a coastal city of Perú, located in a valley surrounded by a desert

motivated my interest in studying the automatic milking systems (AMS) and their potential economic benefits for the dairy industry.

#### What research projects are you involved in?

Currently, I am involved in three projects. The NCR-SARE grant is funding a multi-state multidisciplinary project in which we collaborated with colleagues from four universities. The project “Financial feasibility and environmental implications of adopting Automatic Milking Systems by dairy farms in Wisconsin and Minnesota” focuses on researching the economic benefits and cost of robotic milking, including labor and environmental impacts and effects on the farmers’ quality of life.

I have a DATCP grant to evaluate the economic impact of increasing exports of dairy products by 25 percent in Wisconsin in accordance with Wisconsin Act 92. My project will also address structural changes in resources needed to fulfill this expansion. Finally, I am involved with a Hub-funded collaboration between colleagues from UW-Madison, UW-Platteville and UW-River Falls, to improve the financial accounting data for dairy farms in Wisconsin.

#### What’s one thing you hope students who take a class with you will come away with?

That life is a balance – to obtain something, even free, you must give up something (such as time). Thus, we must prioritize what makes us happy. Currently I teach agricultural economics and the new dairy economics and marketing course. I currently supervise three undergraduate research students and serve as faculty advisor for one of the undergraduate academic organizations.

#### What is your educational and professional background including your previous position?

I earned my bachelor’s degree in food science at Zamorano University in Honduras. Then, I pursued my master’s degree at the University of Georgia and PhD at Purdue University in agricultural economics. My doctoral dissertation focused on the climate change interactions with forest carbon sequestration, carbon pricing, agriculture, and food security.

I started my professional career as faculty lecturer in food and resource economics at the University of Florida for three and a half years, earning the Innovation Teaching Award during my last year in the position. Then, I was an assistant professor at the University of Maryland Eastern Shore during 2020, before moving to UW-River Falls.

#### How did you get into your field of research?

I became interested in the dairy industry while working on my dissertation. I observed that one of the major sectors impacted by climate change were ruminants. Thus, in one of my essays, I evaluated the interaction between climate change mitigation, pasture, and the dairy industry. Likewise, one of my research interests is finding sustainable practices and technologies that can improve the environment and support the farmer’s community. This



#### What excites you most about the Dairy Innovation Hub?

The Dairy Innovation Hub has given me the opportunity to grow as a professional by allowing me to participate in different workshops, professional development and academic conferences. It has allowed me to also connect with amazing colleagues in the dairy area and work with amazing students. Likewise, the Hub has supported my pilot projects that have led me to obtain my current research grants.

I hope that my work will benefit dairy farmers, the community and will contribute to new research in the areas of dairy technologies, labor impacts, and the effects of climate change and environment for this industry.

#### In addition to teaching and research, are you involved in any outreach efforts?

Outreach is a critical component of my research and efforts will start in the 2023-2024 academic year, including engaging farmers in focus groups, case studies and advisory committee efforts. Plans include multiple outreach

and extension efforts in Wisconsin, Minnesota, and the Southern United States to inform the results of our study on Automatic Milking Systems.

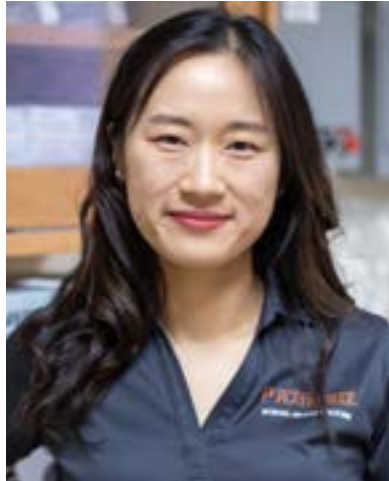
#### What was your first visit to campus like?

I had a very pleasant visit to campus. I recall that my visit was at the end of April, the weather was still a little bit cold but sunny. Since I arrived at the Minneapolis airport, I noticed how friendly the community was, and I felt instantly at home. I had the opportunity to walk around campus and see the infrastructure and the classrooms. I talked to each of my colleagues and it gave me the opportunity to see the positive work environment, which were major factors when taking my decision of accepting this position.

*Above: Peña-Lévano has already hit the ground running securing outside investment from state and national funding agencies for his research at UW-River Falls. His work on the cost of dairy production and the financial feasibility of automatic milking systems include collaborations with UW-Madison and UW-Platteville. Photos by Pat Deninger/UW-River Falls*



## NEW FACULTY PROFILE



### Zifan Wan

assistant professor | Dairy Food Science and Management  
UW-Platteville | start date Aug. 2021

#### What is your hometown?

My hometown is Beijing, China and I grew up there.

#### What is your educational and

#### professional background, including your previous position?

I obtained a bachelor's degree in food science from Purdue University. From there, I attended Iowa State University for graduate school in the Department of Food Science and Human Nutrition, where I worked on the utilization of non-thermal technology, cold plasma, for listeria inactivation in fresh cheeses (queso fresco). After graduating, I joined the University of Tennessee-Knoxville as a postdoctoral researcher, where I worked on research related to the utilization of food by-product or waste materials including dairy by-products and to produce novel and value-added ingredients.

#### How did you get into your field of research?

I've always been concerning with the food waste and spoilage issues. While traditional thermal processing ensures safety and extends the shelf-life of foods, consumers' demand for fresh and safe products drives the need for alternative non-thermal processing strategies. This brought my interests in exploring potential non-thermal processing technologies to solve these obstacles. During my graduate study, I worked on the utilization of the novel non-thermal plasma treatment for food processing, including fresh produce, fresh cheeses, etc. for pathogen elimination and shelf-life extension. This experience

intensified my interests in non-thermal processing technology. At UW-Platteville, I am excited to continue my research on non-thermal processing technology focusing on ensuring safety and extending shelf-life of perishable dairy products while maintaining product quality.

To decrease food waste, in addition to extending shelf-life, utilizing food waste and by-products could also play an important role. Extracting value-added ingredients from food waste materials is another important aspect of my research, which could help to decrease food waste and contribute to the sustainable food production.

#### What are the goals of your current research program?

The ultimate goal of my research program is to explore and evaluate novel technologies and methods which can eliminate pathogens, maintain food quality, extend shelf-life and reduce food waste.

#### What attracted you to UW-Platteville and the Dairy Innovation Hub?

I am thrilled for the opportunity to work on research, teaching, and outreach to enhance the dairy industry in Wisconsin. Thanks to the Hub, my position is unique because it allows collaborative work among the three campuses and multidisciplinary work here at UW-Platteville. The availability of Pioneer Farm also provides potential collaborative research with my colleagues in animal and dairy science. Moreover, the vision and effort to build a dairy pilot plant on campus makes this position very attractive to me.

My plan is to develop a research group based at UW-Platteville focusing on non-thermal technology for



dairy processing. I am excited to play a role in equipping students with sufficient knowledge of dairy foods which will prepare for careers in dairy processing. Most importantly, as I am in America's Dairyland, I look forward to working with dairy farms and processing units to solve the practical questions they have.

#### What's one thing you hope students who take a class with you will come away with?

For my dairy processing and analysis class, I hope students will keep in mind all dairy products need to start with high quality milk and all steps from the farm to consumers are important to ensure the quality and safety of dairy products.

#### Does your work relate to the Wisconsin Idea?

Yes, I think my work is very much relevant to the Wisconsin Idea in which "education should influence people's lives beyond the boundaries of the classroom". The Dairy Innovation Hub aims to support research and development at the three campuses to keep Wisconsin's dairy community at the global forefront. The main goal

of my work is to find novel strategies and solve practical problems which will help the dairy industry to improve product safety, quality, and shelf-life, and as a result, bring economic benefits to the industry and the community.



Top and above: 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. In her lab, Wan has developed a pilot scale, plasma-activated water system to test this process. Photo by Andy McNeill/UW-Platteville

## GRADUATE STUDENTS

In FY 22, the first cohort of Hub-funded graduate students began their two-year assistantships at UW–Madison, including one collaboratively funded student shared with UW–River Falls.

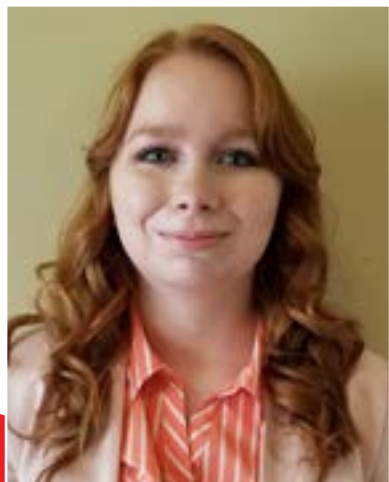


### Walker Crane

Department of Soil Science

*“Increasing environmental stewardship of dairy forage production systems with cover crops”*

Crane received a bachelor’s degree in plant and environmental soil science from Texas A&M University, where he developed a passion for soil health and sustainable cropping systems. As an undergraduate, he conducted research investigating the effect of cover crops and tillage on greenhouse gas emissions. He was also involved with research projects using low-field magnetic resonance imaging to phenotype sorghum roots and UAVs to implement precision irrigation scheduling. Crane is pursuing a master’s degree in soil science mentored by Francisco Arriaga from the Department of Soil Science.

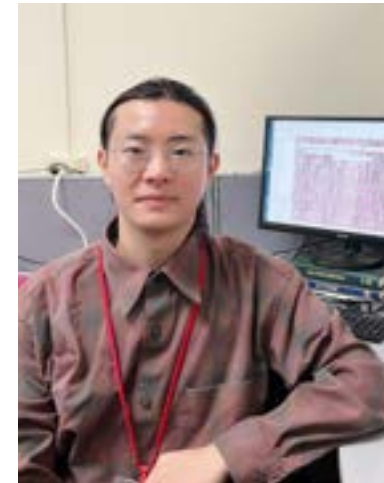


### Grace Enzien

Department of Bacteriology

*“Dairy residue bio-conversion into designer (d)-lactic acid”*

Enzien received a bachelor’s degree in biochemistry from the University of Illinois at Chicago. Previous undergraduate research, internships, and professional experience, including as a formulation technician for Blistex, Inc., led to Enzien developing a breadth of lab skills, from basic protocols, such as lab upkeep, to extracting DNA and genotype samples. She is pursuing a master’s degree in bacteriology and is mentored by Timothy Donohue from the Department of Bacteriology.



### Jiahao Fan

Department of Biological Systems Engineering

*“Assessing maize silage yield and quality using UAV-based hyperspectral imagery and machine learning”*

Fan received both his bachelor’s and master’s degrees in geographic information systems from Wuhan University in China. He was a PhD student in the Department of Informatics at the New Jersey Institute of Technology for two years. Fan is now pursuing a PhD in biological systems engineering, mentored by Zhou Zhang from the Department of Biological Systems Engineering.



### Benjamin Iesalnieks

Department of Food Science

*“Manufacturing natural cheeses containing bioactive peptides with improved antihypertensive properties”*

Iesalnieks received bachelor’s degrees in biochemistry and chemistry from the University of Minnesota–Duluth. His undergraduate research experience and course work developed valuable, transferable, lab and analytical skills that he now applies to areas of food product development, formulation, and production. Iesalnieks is pursuing a master’s degree in food science mentored by Rodrigo Ibanez Alfaro from the Center for Dairy Research.



### Kaylee Riesgraf,

Department of Animal and Dairy Sciences

*“Understanding maternal and management stressors impacting dairy heifer growth and feed efficiency”*

Riesgraf grew up on her family’s farm near Fond du Lac, Wis. and received a bachelor’s degree in dairy science from UW–River Falls. Previous experience on her home farm and an internship at Holsum Dairies in Hilbert, Wis. sparked a passion for diagnosing sick cows and developing treatment plans. Riesgraf also developed strong analytical skills working with data and using herd management software to drive decision-making. Riesgraf is pursuing a master’s degree in dairy science and is mentored by Kent Weigel from the Department of Animal and Dairy Sciences. Her assistantship is collaboratively mentored and co-funded by UW–River Falls.



## RESEARCH PROFILES



### ENSURING ANIMAL HEALTH AND WELFARE

#### Jimena Laporta

assistant professor | Animal and Dairy Sciences  
UW-Madison

**Project title:** Innovative methods to detect and protect against heat stress in dairy calves

**Summary:** When Wisconsin dairy farmers think about ways to limit heat stress on their animals during the hottest days of summer, their

milk-producing cows are likely their top priority. Calves can adapt and thrive more effectively under these conditions, while cows show their discontent with reduced milk production. So, it's more common to see various types of cooling methods for lactating cows and not for calves. But Laporta and her lab team believe that more can be done to make hutch-housed dairy calves healthier and more comfortable.

Early exposure to heat stress harms the welfare, health, and production of dairy calves, Laporta says, yet research on heat-stress abatement for dairy calves is primarily limited to animals living in subtropical and arid climates. As a result, there's a lack of information on how to prevent heat stress in dairy calves in the Midwest. This gap persists even as summer temperatures rise in the region due to climate change.

With funding from the Hub, Laporta is working to identify heat stress animal and environmental thresholds in Wisconsin dairy calves as well as new methods of heat-stress abatement she can recommend to dairy farmers.

*Laporta and her team are investigating heat-abatement techniques like solar-powered continuous mechanical ventilation for dairy calves housed in outdoor hutches. Photos by Michael P. King/UW-Madison CALS*



## ENSURING ANIMAL HEALTH AND WELFARE



#### Ryan Pralle

assistant professor, Animal and Dairy Science, UW-Platteville,  
School of Agriculture



#### Peter Lammers

associate professor, Animal and Dairy Science, UW-Platteville,  
School of Agriculture

**Project title:** Leveraging automated milking systems to employ targeted saturated fatty acid supplementation strategies to early lactation dairy cows

**Summary:** Dairy cows often experience a negative energy balance during the transition to lactation period, where dietary energy intake is outpaced by the demands of lactation. This early lactation energy deficit puts dairy cows at risk for metabolic disorders like hyperketonemia, which causes reduced productivity, low fertility, greater risk of health problems and ultimately, culling. Saturated fatty acids (FA) have demonstrated potential to improve early lactation cow productivity and health, with higher-yielding cows potentially having more benefit from saturated FA than lower-yielding cows. However, it is difficult to supplement early lactation cows based on productivity because they are often housed in mixed groups.

Automated milking systems (AMS) enable strategic supplementation of feedstuffs like saturated FA to specific cows housed in mixed groups. This project will determine the effectiveness of saturated FA supplementation to early lactation cows for improved cow productivity and metabolic health at different production levels.

Results of this research will show the effectiveness of using AMS systems to individualize nutrition for dairy cows, in this case early lactation and greater-producing cows housed in mixed groups. This strategic supplementation could lead to improved health and productivity of studied cows and lead to future research using a similar supplementation approach.



*Erin Kammann is a graduate student at UW-Madison, collaboratively mentored by Heather White and Ryan Pralle. She received her BS from UW-Platteville and works on individualized nutrition studies at Pioneer Farm. Photo by Andy McNeill/UW-Platteville*



## STEWARDING LAND AND WATER RESOURCES



### Joseph Sanford

assistant professor | Crop and Soil Science  
UW–Platteville, School of Agriculture

**Project title:** Evaluation of biochar incorporation into manure systems for improving air quality and odor management

**Summary:** Manure from dairy facilities impacts water quality, greenhouse gas emissions and odor. Agriculture contributes 50 percent of global emissions of methane and 80 percent of nitrous oxide. Additionally, community complaints about odor associated with dairy manure is a common occurrence in Wisconsin. Farmers are looking for a cost-effective method to manage greenhouse gas (GHG) emissions and reduce odor from manure systems. The purpose of this study is to

evaluate biochar incorporation into two manure management systems, including manure storages and anaerobic digestion, to reduce production of GHG, mitigate odors and advance economic feasibility of anaerobic digestion by improving biogas quality.

The Dairy Innovation Hub has allowed for this applied research to be conducted at UW–Platteville. Working with our bench-top anaerobic digestion system in the lab, we have already identified that biochar can greatly reduce the production of hydrogen sulfide in livestock anaerobic digestion system, but the type of biochar is critical to performance. It is our hope that by reducing the production of hydrogen sulfide in anaerobic digestion system, it will improve current anaerobic digestion systems in Wisconsin, and allow for more Wisconsin dairy farmers to potentially adopt the systems. The data produced from this study is already being applied in the dairy industry, as a larger industry partner has decided to test our biochar dosing idea in larger scale digesters to reduce the burden of hydrogen sulfide on livestock systems in Wisconsin.

The goal with the current anaerobic digestion research is to continue investigating why biochar reduces hydrogen sulfide production and test it at larger scales. It is our hope as well to install some small pilot scale digesters at Pioneer Farm to conduct additional research on systems that are similar to those currently in operation in Wisconsin. With the data collected thus far, we will be going after larger federal funding sources this fall to continue the research into the future.



*Olivia Kozłowska is an environmental engineering student and researcher in Sanford's lab making biochar from different media types, such as pine shavings and corn stover, to determine which media is most effective at phosphorous uptake. Photo by Andy McNeill/UW–Platteville*

## STEWARDING LAND AND WATER RESOURCES



### Scott Sturgul

outreach program manager, Nutrient and Pest Management Program, UW–Madison



### Damon Smith

professor and extension plant pathologist, director, Nutrient and Pest Management Program, UW–Madison



### Mimi Broeske

distinguished editor, Nutrient and Pest Management Program, UW–Madison

**Project title:** A new approach to nutrient management planning on Wisconsin dairy farms

**Summary:** In April 2022, UW–Madison's Nutrient and Pest Management (NPM) Program released a new, online, self-paced Nutrient Management Farmer Education curriculum. This curriculum is an evolution of a classroom-based format that has trained farmers across Wisconsin for years on the process of preparing farm nutrient management plans.

Most farms across the state will need to have a nutrient management plan for their farm – many already do. The original curriculum was an evolving collection of instructional tools and presentations for educating farmers – and others – on nutrient management practices. Traditionally, the curriculum was delivered in small group settings.

The new curriculum is in an online, video format that allows for self-paced learning by users. The new curriculum is available at: [nmfe.webhosting.cals.wisc.edu/](http://nmfe.webhosting.cals.wisc.edu/). Content is displayed in a modular format. Each module deals with a specific component of a nutrient management plan and features multiple, short, instructive videos along with linked resources.

The goal of this project is to increase the convenience of NM planning with this stay-at-home, use-anytime format. It is our hope that this tool leads to increased development and implementation of NM plans on Wisconsin dairy farms.

In addition, to the financial support for this project supplied by the Wisconsin Dairy Innovation Hub, the Wisconsin Department of Agriculture, Trade and Consumer Protection also supported the project.

*The Nutrient Management Farmer Education curriculum is delivered in an online, module-based format that allows for self-paced learning. Users still have access to the same experts and resources, but now can use the curriculum when it is convenient for them.*





# ENRICHING HUMAN HEALTH AND NUTRITION

## Pioneer Sweets at UW–Platteville

In early 2022, a dream nearly 10 years in the making became a reality at UW–Platteville. Pioneer Sweets, a student-managed ice cream business is creating lasting learning opportunities from farm to fork and everywhere in between.

Students manage product development, operations, sales, customer service and marketing. They also help navigate food production licensing and regulation for the business. Eventually, Pioneer Sweets hopes to use milk from the newly renovated Pioneer Farm dairy to make their delicious treats a complete local food experience.

To help get Pioneer Sweets going, initial grant funding was secured from the Dairy Innovation Hub, Compeer Financial and the Wisconsin Department of Agriculture, Trade and Consumer Protection.

Pioneer Sweets is just one piece of the dairy processing dream at UW–Platteville. Plans are underway to construct a dairy plant, store, and retail outlet at Pioneer Farm that will be supplied with fresh milk mere feet away from the cows. This bigger vision will take years of planning and fundraising, but for now, Pioneer Sweets is making its mark on campus in a temporary location.

Orders are taken online and promoted on social media. Pioneer Sweets is also available for special events where clients can design unique flavors for their group. Student employees also provide product at various campus and community events.

Pioneer Sweets is also giving back to their community by donating a portion of their proceeds towards purchasing dairy products for Pioneer Provisions, a campus-based food pantry. Follow the Pioneer Sweets journey on Facebook @PioneerSweetsUWP.



From top: Lucy Kniebuehler is a dairy science student and employee with Pioneer Sweets. She's learning dairy processing skills from Tera Montgomery, professor of animal and dairy science, who advises the group. Photos by Andy McNeill/UW–Platteville

# ENRICHING HUMAN HEALTH AND NUTRITION



**Beth Olson**  
associate professor  
Nutritional Sciences  
UW–Madison



**Bret Shaw**  
associate professor  
Life Sciences  
Communication  
UW–Madison



**Todd Newman**  
assistant professor  
Life Sciences  
Communication  
UW–Madison



**Ashley Cate**  
PhD student,  
Life Sciences  
Communication  
UW–Madison

**Project title:** Determining consumer preferences for health and other product attributes of dairy milk

**Summary:** The US Dietary Guidelines for Americans informs all federal food and nutrition programming, and is used by health professionals, educators, and by industry in formulating products. These guidelines recommend milk, yogurt, and cheese to contribute to adequate intakes of calcium, vitamin D, potassium, and other essential nutrients. As part of an overall dietary pattern, dairy products have been shown to improve health outcomes. Consumption of fluid milk has fallen in recent years, while there has been a growing market for alternative plant beverages which lack the nutritional components of milk. Research has found reasons for not using milk include cultural practices, personal preferences, perceived lack of health benefits, concerns with milk components, or the conditions under which milk is produced.

Extension programming serves a broad audience, including policy makers, public health partners, and producers. Nutrition programs provided by Extension are focused on families, youth, and single adults, reach many marginalized populations, and seek to improve health inequities. Previous research has provided insights into consumers' perceived health benefits of, as well as concerns about, milk consumption. This project is exploring how consumers prioritize these benefits and concerns, along with price, as the basis for developing messaging to increase milk consumption to promote public health and a vibrant dairy community.

Current recommendations for healthy, nutrition diets include dairy. Communication on dairy can have influence on which dairy products people choose for themselves and their families. The research brings together various disciplines: nutrition, communication, and market research, to develop better messaging to support dairy production and consumption in Wisconsin and beyond.

From left: consultant Barry Radler, Todd Newman, Ashley Cate and Beth Olson used marketing research to determine consumer preference of milk attributes. Results show which attributes are most influential on decision-making relative to price. The final step is to develop messaging for nutrition educators to help increase milk consumption. Photo by Jori Skalitzky/Dairy Innovation Hub



# GROWING FARM BUSINESSES AND COMMUNITIES



## Arquimides Reyes

assistant professor | Animal and Food Science  
UW-River Falls

**Project title:** "Preliminary comparison of HolSim cattle vs. Angus x Holstein cattle"

**Summary:** With support from the Dairy Innovation Hub, UW-River Falls partnered with Holstein Association USA to work toward providing dairy and beef farmers with research that evaluates dairy-beef feedlot performance and carcass composition that have the potential to provide premiums.

For this particular project, Reyes and co-PI Steve Kelm, are evaluating HoI-Sim (Holstein and SimAngus) cattle and Holstein Angus crossbred cattle for a comparison of feedlot performance and carcass quality that relate directly to farmer profitability. This information will equip farmers with the knowledge to make genetic selection, and nutritional management decisions that have the potential to increase margins. Furthermore, farmers who raise dairy-beef calves will have more information to base buying decisions and production information to help determine optimal cattle that will produce high quality, red meat yield.

The increased production of crossbred dairy-beef calves (due to genomics and feed efficiency), the decline in dairy profitability, and the desire for pricing information for dairy versus beef, along with dairy-beef calves have sparked interest in the topic of selecting the correct breed to develop market ready animals that meet or exceed current beef cattle performance.

The industry currently desires black hided cattle but not all black hided cattle perform uniformly in the feedlot or at the packer; therefore, our goal is reduce the guessing game and improve profitability.

Partnering with the Dairy Innovation Hub allows the research team to leverage additional funding sources for a larger impact. Exploring different marketing avenues and premiums for the dairy-beef sector will add value to virtually all dairy farms in Wisconsin and beyond.



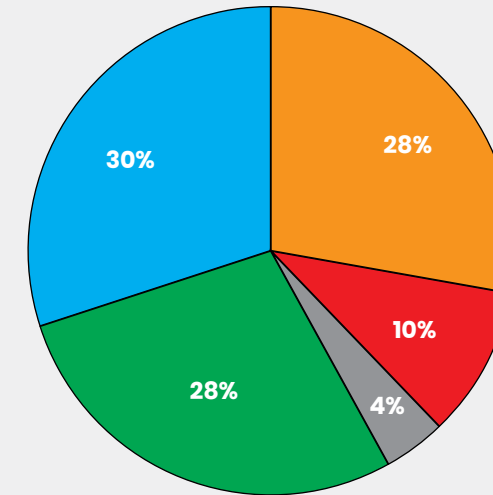
Arquimides Reyes and student researcher Luke Geist (right) experiment with dairy-beef crosses to improve feedlot performance and carcass quality. Photo by Pat Deninger/UW-River Falls

# FINANCIAL OVERVIEW

Fiscal Year 22: July 1, 2021 – June 30, 2022

## By expense type

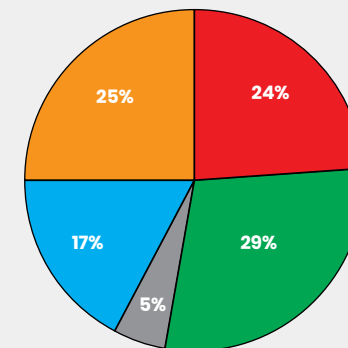
- Research expenditures
- Equipment
- Trainees and other salary
- Faculty salary
- Farm support and outreach



FY 22 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 already seeded recruitment of new talent, equipment investments and research projects.

With 130+ awards to date, projects are in various stages of progress and 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 evenly over the Hub's four priority areas, leading to maximum impact for the dairy community.

## By priority area



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

## FY 22 FINANCIAL HIGHLIGHTS:

More than **\$3.3M**

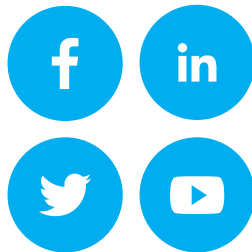
for faculty, trainees and staff  
**NEW DAIRY TALENT**

Total **\$7.8M**  
**FUNDS ALLOCATED**  
for dairy initiatives



## COMMUNICATIONS STRATEGY

### SOCIAL MEDIA



- » 1,723 followers across four social platforms, a 70% increase over FY 21
- » LinkedIn page introduced June 2022, quickly became top platform
- » 46,176 impressions on LinkedIn since June, posts consistently achieve 2%-5% engagement rate
- » Top Facebook post: "Tera Montgomery speaks at Dairy Symposium", UW-Platteville, 5,586 reach
- » 78,000 impressions on Twitter
- » 4,455 views on YouTube
- » All organic reach, no sponsored content for FY 22

### MEDIA RELATIONS

- » 186 popular press mentions
- » Nine press releases sent to promote funding decisions at UW-Madison, UW-Platteville, and UW-River Falls
- » Regular media interviews with Hub staff and researchers

### 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 800 (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](http://dairyinnovationhub.wisc.edu). All content is free and publicly available.

### OUTREACH IMPACT

- » 25 public and stakeholder presentations given. Including campus centers, conferences, information sessions for public audiences, trade groups, agencies and legislators
- » 13 in-kind articles, authored by Hub staff (not including researchers), contributed to dairy association publications

## CONFERENCES AND EVENTS

### DAIRY SUMMIT

The Hub held its second annual Dairy Summit on Nov. 17, 2021. The event, held in a virtual format achieved 244 registrations, 240 live views plus hundreds of on-demand views after the conference.

The event included welcome remarks, progress reports on Hub-funded research projects, as well as panel sessions featuring dairy farmers, newly hired faculty members and researchers. UW-Madison hosted the summit and gave participants virtual tours of several key facilities critical to dairy research in the College of Agricultural and Life Sciences (CALs).

The Dairy Summit highlights the Hub's newest research and is formatted for a public audience.



### DAIRY SYMPOSIUM

The Hub held its first annual Dairy Symposium on Nov. 18, 2021 at Union South on the UW-Madison campus. The event, which drew over 100 in-person attendees, provided scientists a chance to share and discuss the initial results of their Hub-funded research projects with researchers, university students and dairy professionals. Another 100 people attended the event virtually, and videos of symposium sessions were available online after the event.

The event featured thought-provoking plenary sessions and breakout sessions aligning to each of the Hub's main priority areas. Attendees browsed more than 30 posters featuring Hub-funded research.

The Dairy Symposium focuses on the Hub's most advanced research, formatted for an academic audience.

"This was the first face-to-face event we've had [due to the pandemic]. It was nice to finally get to meet in-person some of my colleagues that are part of this huge Dairy Innovation Hub," said Veronica Justen, professor of crop science from UW-River Falls, who has a Hub-funded faculty fellowship.



From top: Former UW-Madison Chancellor Rebecca Blank offered a welcome at the 2021 virtual Dairy Summit event. Denise Ney, professor of nutritional sciences at UW-Madison, delivered the closing plenary at the inaugural Dairy Symposium and Shelly Mayer from PDPW, engaged in discussion at the event. Photos by Michael P. King/UW-Madison CALS

## CONFERENCES AND EVENTS

### TAKING RESEARCH ON THE ROAD

Winter is “meeting season” for the ag community in Wisconsin. The Hub team hit the road and shared project outcomes, in person, from researchers at UW–Madison, UW–Platteville and UW–River Falls with the public.

The Hub hosted a booth at the Wisconsin Farm Bureau Federation annual meeting in December and the Dairy Strong conference, hosted by Dairy Business Association, in January.

On January 18, 2022, the Hub’s faculty director, Heather White, provided a program overview, progress update and answered questions during the discussion portion of Dairy Day at the Capitol, coordinated by Dairy Business Association. During her presentation, White shared real-life examples of research funded by the Hub to benefit farmers, dairy processors, and the people of Wisconsin.

That same day, the Hub hosted an informational research poster session on the iconic rotunda of the State Capitol to highlight select projects funded by the initiative at each participating campus. Legislators, staff and the public browsed research posters and engaged with students and faculty affiliated with Hub-funded projects.

At the end of January, White shared a program overview and progress report at the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) board meeting. The creation of the Dairy Innovation Hub was a top recommendation from DATCP’s Dairy Task Force 2.0 in 2018. To that end, research at each participating campus works to align with other recommendations from the task force.

The Hub concluded our winter roadshow with a productive trip to the Professional Dairy Producers Business Conference. In addition to a trade show presence, PDPW invited the Hub to display 26 research posters in the Nexus Innovation Lane area. This space was dedicated to inventors, creators and idea-generators sharing their most novel ideas. The Hub fit right in!



From top: Albert Boaitey from UW–River Falls talks with Rep. Shannon Zimmerman at the Hub’s information poster session at the State Capitol. The Hub displayed research posters at the PDPW Business Conference. Faculty Director Heather White delivered an invited informational presentation at DBA’s Dairy Day at the Capitol legislative day.

## AWARD LISTING

### FY 22 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

##### Short term, high impact grants

- The EZ Dairy Enviro-Money: a high level environmental and economic assessment tool for dairy farmers – Victor Cabrera, Department of Animal and Dairy Sciences
- Estimating energy value and milk yield potential of whole-plant corn forage – Luiz Ferraretto, Department of Animal and Dairy Sciences

##### Postdoctoral research fellowships

- Green ammonia recovery from manure digester and lagoon by electrodialysis – Donald Lee Vineyard, Department of Soil Science
- Improving pest management to expand adoption of intercropping alfalfa and corn for Wisconsin dairies – mentored by Mark Renz, Department of Agronomy

##### Graduate student assistantships

- Investigating the disproportionality of pollutant loading based on farmer social indicators – Margaret Kalcic, Department of Biological Systems Engineering. Student: Andrew Hillman

#### UW–Platteville

##### Faculty research fellowships

- Evaluating nitrogen availability from solid-liquid-separated and composted manure – Joe Sanford, School of Agriculture and Chris Baxter, School of Agriculture
- Full implementation of automated rotational grazing and assessment of its impact on animals and on forage – Harold T. (Hal) Evensen, Engineering Physics; Andrew Cartmill, School of Agriculture; Cyrus Habibi, Electrical Engineering

##### Equipment

- Enhancing elemental analysis capabilities for organic substances at UW–Platteville – Chris Baxter, School of Agriculture and Joe Sanford, School of Agriculture
- Enhancing anaerobic digestion biogas analysis capabilities at UW–Platteville – Joe Sanford, School of Agriculture
- Land and water resource resilience: key metrics of water quality and soil health – Andrew Cartmill and Dennis Busch, School of Agriculture



## UW–River Falls

### Faculty research fellowships

- Efficient manure land application through vertical tillage systems: feasibility and environmental impacts – Bob Zhiwei Zeng, Patrick Woolcock and Joel Peterson, Department of Agricultural Engineering Technology and Natasha Rayne, Department of Plant and Earth Science

### Equipment

- Supplemental funding for analytical lab and collaborative research space – Heather Sumner-Davis, Department of Plant and Earth Science
- Electric Autoclave used to sterilize instruments, liquids, and biological wastes – David Zlesak, Department of Plant and Earth Science and Larry Baumann, Department of Animal and Food Sciences
- Reimagining 131/132 Agricultural Sciences Building to accommodate Hub-funded equipment to build research capacity – Heather Sumner-Davis, Department of Plant and Earth Science
- Enhancing crop health assessment through acquisition of a porometer/fluorometer – Veronica Justen, Department of Plant and Earth Science

## Growing farm business and community

### UW–Madison

#### Short term, high impact grants

- Assessing and addressing barriers to dairy product exports by small and medium sized Wisconsin manufacturers – Charles Nicholson, Department of Agricultural and Applied Economics
- Predicting meat cuts and carcass traits of beef-on-dairy calves through 3D images of live animals – João Dorea, Department of Animal and Dairy Sciences
- Whey-to-1,2-propanediol: unraveling the metabolic limitations to enhanced biosynthesis – Victor Ujor, Department of Food Science

#### Postdoctoral research fellowships

- Galactooligosaccharides (GOS) synthesized from lactose as milk supplement to promote probiotic growth – Sonali Mohapatra, Department of Biological Systems Engineering

### UW–Platteville

#### Faculty research fellowships

- Opening windows for research, teaching, and demonstration through rumen cannulation – Ryan Pralle, School of Agriculture and Krista Hardyman, School of Agriculture

#### Equipment

- Acquisition of a differential scanning calorimetry machine – John Obielodan, Mechanical Engineering; Zhezhen Fu, Mechanical Engineering; Danny Xiao, Civil Engineering; Joseph Wu and Ian Mackenzie, Chemistry

#### Postdoctoral research fellowships

- Risper Nyairo – Intersection of dairy farmland, water and food for local communities including the campus community

## UW–River Falls

### Faculty research fellowships

- Development of whey protein-lignin based film/coating materials for dairy food packaging applications – Youngmi Kim, Department of Agricultural Engineering Technology and Grace Lewis, Department of Animal and Food Science

## Ensuring animal health and welfare

### UW–Madison

#### Short term, high impact grants

- Genomic solutions to improve dairy bull fertility – Francisco Peñagaricano, Department of Animal and Dairy Sciences
- Combinatorial AMP therapy to control bovine mastitis – Hilario Mantovani, Department of Animal and Dairy Sciences
- Evaluating Salmonella Cerro as a preventative for Salmonellosis – Garret Suen, Department of Bacteriology

#### Postdoctoral research fellowships

- Selection for resilient dairy cows – Ligia Cavani, Department of Animal and Dairy Sciences
- Comparing the efficacy of EGTA and 5-HTP induction and resolution of hypocalcemia in dairy cows – Haylee Hanling, Department of Animal and Dairy Sciences

#### Graduate student assistantships

- Controlling ruminant methane emissions employing lactic acid bacteria and their metabolites – Hilario Mantovani, Department of Animal and Dairy Sciences. Student: Alice Peres Marques Assumpção

### UW–Platteville

#### Faculty research fellowships

- Developing novel and sustainable disease management strategies against Aphanomyces root rot of alfalfa – Muthu Venkateshwaran, School of Agriculture

#### Equipment

- Validating a novel serological panel for bovine fatty liver syndrome – Ryan Pralle, School of Agriculture and Erin Kammann, Department of Animal and Dairy, UW–Madison

### UW–River Falls

#### Faculty research fellowships

- Characterizing the behavior and management of dairy cows and neonate calves shortly after birth – Kate Creutzinger, Department of Animal and Food Sciences and Jennifer Van Os, Department of Animal and Dairy Sciences, UW–Madison

**Equipment**

- Downdraft table for forage and grain analysis – Heather Sumner-Davis, Department of Plant and Earth Science
- Replacement and improvement of video recording systems at the Mann Valley Farm Dairy Learning Center, phase 1 – Kurt Vogel, Department of Animal and Food Sciences

## Enriching human health and nutrition

**UW–Madison****Short term, high impact grants**

- Improving the properties of cheese snacks by applying acoustic and textural mapping – Selvarani Govindasamy-Lucey, Center for Dairy Research
- Pilot scale demonstration of a process to convert an acid whey waste stream to high value food products – Scott Rankin, Department of Food Science

**Postdoctoral research fellowships**

- Buccal swabbing as a molecular tool for rumen microbial profiling and diagnosis in dairy cattle – Juliana (Dias) Young, Department of Bacteriology

**Graduate student assistantships**

- Dairy-derived protein sources and optimal postsurgical metabolic management and outcomes – Joseph Pierre, Department of Nutritional Sciences. Student: Karen Angélica Gomes Vilela Antunes

**UW–Platteville****Faculty research fellowships**

- Utilization of plasma activated water (PAW) as a clean-in-place (CIP) sanitizer for surface disinfection of dairy processing equipment – Zifan Wan, School of Agriculture

**Equipment**

- Characterization of cold plasma via optical and electrical diagnostics – Zifan Wan, School of Agriculture

**UW–River Falls****Faculty research fellowships**

- Optimization of casein micelle nanoparticle formation using high pressure homogenization and processing aids – Grace Lewis, Department of Animal and Food Science

**Equipment**

- Texture analyzer for dairy products – Grace Lewis, Department of Animal and Food Science



Above: Seen through the tailgate of a fleet minivan, UW–Madison postdoc Jing Zhou, left, and PhD student Jiahao Fan, right, prepare a drone for flight over an alfalfa field at Arlington Agricultural Research Station. Both are members of Zhou Zhang's lab in biological systems engineering. Photo by Michael P. King/UW–Madison, CALS





# DAIRY INNOVATION HUB

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“

*Collaboration is key  
and communication  
is paramount*

”

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