

2021 Dairy Innovation Hub Dairy Summit
Wednesday, Nov. 17: 10 a.m. – 3:00 p.m.
Virtual conference



Speaker information and abstracts

Listed in presentation order

Welcome

Rebecca Blank, Chancellor, UW–Madison

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Rebecca Blank became chancellor of Wisconsin’s flagship university in July 2013, bringing with her a deep commitment to educational excellence and innovation. Blank is an internationally respected economist who also has spent time in Washington, D.C., working in three different administrations. Most recently, she served as deputy secretary and acting Secretary of Commerce under President Obama. She was a member of the Council of Economic Advisers under President Bill Clinton. Blank’s commitment to expanding and improving educational opportunities inside and outside the classroom to better prepare students to succeed in a rapidly changing economy has been a hallmark of her tenure at UW.

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

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Kate VandenBosch became dean of the UW–Madison College of Agricultural and Life Sciences in March 2012. Prior to that, VandenBosch was a professor of plant biology at the University of Minnesota in St. Paul. In 2001, she became head of the plant biology department there, but took a brief hiatus in 2006 to serve as interim dean of the newly formed College of Food, Agricultural and Natural Resource Sciences.

**Wayne Weber, Dean, College of Business, Industry, Life Science and Agriculture,
UW-Platteville**

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Wayne Weber has served as dean of BILSA since 2011 (with one year as interim). He joined the faculty at UW-Platteville in 1997 in the Biology Department where he served in the faculty for fourteen years. During this time, he was active in molecular phylogenetic research and engaging numerous students in that research resulting in multiple research presentations. Dr. Weber also served in leadership roles during this time including serving as Department Chair in the Biology Department and serving on faculty senate for six years.

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

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Hub-funded research introductions
Ensuring animal health and welfare

Jimena Laporta, Department of Animal and Dairy Sciences, UW-Madison

"Innovative methods to detect and protect against heat stress in dairy calves"

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Laporta is an assistant professor in the Department of Animal and Dairy Sciences at the University of Wisconsin-Madison. Her research investigates how autocrine, systemic, and environmental factors affect the regulation of mammary gland development and function. Additionally, she researches how these factors affect milk synthesis and composition.

Project summary: Wisconsin dairy cows and calves are susceptible to rising global temperatures which threatens animal welfare, health, and productivity. This project seeks to identify heat stress thresholds in Wisconsin dairy calves. Once a heat stress threshold is identified, Laporta and her team will study methods to eliminate or reduce heat stress on dairy calves in outdoor hutch systems.

Ryan Pralle, animal and dairy science, UW–Platteville

“Leveraging automated milking systems for targeted saturated fatty acid supplementation”

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Pralle is an assistant professor of animal and dairy science in the UW–Platteville School of Agriculture. After receiving his B.S. (2015) and Ph.D. (2020) from UW–Madison, Ryan joined UW–Platteville as a tenure-track faculty member supported by the Dairy Innovation Hub, engaging in research, outreach, and teaching. Ryan’s research interests span dairy cow nutrition and predictive analytics.

Project 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 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.

Kate Creutzinger, Department of Animal and Food Science, UW–River Falls

“Evaluation of two caustic paste brands when disbudding calves”

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Creutzinger joined the faculty this past August as an assistant professor specializing in dairy animal welfare. Her position is funded by the Dairy Innovation Hub and her future interests involve the improvement of dairy cattle quality of life used in various agriculture systems by developing a robust teaching and research program focused on applied behavior, welfare, and sustainability.

Project summary: In the US, over 94 percent of dairy calves need to be disbudded, a process that removes their horn tissue. Caustic paste is increasing in popularity however no research has been done to evaluate appropriate application volumes. The primary objective of our research is to determine the necessary volume of two different brands of paste for effective disbudding. The secondary objective is to determine pain and wound healing from these different paste volumes and brands.

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Hub-funded research introductions

Stewarding land and water resources

**Matt Akins, Department of Animal and Dairy Sciences,
Marshfield Ag Research Station, UW-Madison**

“Cocktail forage mix yield, quality and use in cow rations”

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Akins began his current role in 2015 as an assistant scientist and extension specialist working mainly with dairy heifer nutrition and forage management. As part of this role, he works with the Marshfield Agricultural Research Station to conduct heifer research studies to evaluate nutrition and forage feeding strategies to control heifer growth and costs of production.

Project summary: The use of cocktail forage mixes (BMR sorghum-sudangrass, Italian ryegrass, clovers, hairy vetch) as part of the dairy forage system has become more popular the past few years due to weather impacts, alfalfa winterkill, and increased opportunity for manure distribution. However, limited yield and quality research data are available. The objectives of this study include 1) evaluate yield and quality of cocktail forage mixes using on-farm data, 2) evaluate how management factors (seeding depth, row spacing, and red clover varieties) affect forage mix growth and quality, and 3) assess cocktail forage mix fermentation quality and lactating cow performance when fed diets with or without the cocktail forage mix. The goal of this study is to understand forage mix quality and yield and provide relevant data so farmers can make informed cropping and feeding decisions.

Joel Peterson, Department of Agricultural Engineering Technology, UW-River Falls

“Updating manure values in SNAPplus for better nutrient management planning”

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Peterson brought his expertise in civil and environmental engineering to UW-River Falls in 2010. He has industry experience with private engineering consulting firms as well as the U.S. Army Corps of Engineers and the Minnesota Board of Water and Soil Resources. While with the Army Corps of Engineers he spent four months in Iraq as the lead project engineer on several environmental rehabilitation projects.

Project summary: SnapPlus is a nutrient management planning software that allows farmers, planners, and others to estimate soil and nutrient runoff losses on a field-by-field basis and is a key tool to help decision makers protect soil and water quality. Excreted manure nutrient values from laboratory testing may be used as input to the program, if available. In the absence of

laboratory results, default values, derived from laboratory analyses conducted in 2012 across Wisconsin, are used for manure nutrient values in confined housing where the manure is recoverable. Increases in dairy productivity and diet have led to changes in manure nutrient excretion values. This project will update the manure nutrient values for indoor housed and grazing animals, compare them to regression and mass-based volume and nutrient excretion values contained in ASABE standard D384 and recommend changes if necessary. Finally, we will implement any recommended changes and evaluate the impact of those changes in a case study.

Zhezhen Fu and Edoardo Rubino, mechanical and industrial engineering, UW-Platteville

“Wood templated ceramic membranes for dairy wastewater treatment”

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Fu is an assistant professor with research interests in manufacturing processes, ceramic materials and mechanical properties of ceramic materials.

Rubino is an assistant professor with research interests in the development of optical microsensors for the measurement of electric field, magnetic field, and displacement. Rubino previously worked with the Italian Air Force on F16 aircraft maintenance and at the Italian Space Agency on satellite mission design.

Project summary: Wastewater generated from the dairy industry contains high levels of chemical oxygen demand, biological oxygen demand, total suspended solids, turbidity etc. Direct disposal of such wastewater significantly influences the environment. Ceramic membrane filtration systems can efficiently decrease pollutants, however, manufacturing ceramic membranes is expensive and complicated. This project will use bio-inspired wood templates for a low-cost method to prepare ceramic membranes with high efficiency for dairy wastewater treatment.

Hub-funded research introductions
Enriching human health and nutrition

Beth Olson, Department of Nutritional Sciences, UW-Madison

"Determining consumer preferences of dairy milk"

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Olson is an associate professor in the Nutritional Sciences department at University of Wisconsin-Madison. Her research interests include improving infant feeding practices in low-income households and breastfeeding support for low-income and working women.

Project summary: Fluid milk consumption has been declining in recent years as alternative plant beverages grow in popularity. Plant-based beverages, however, lack the nutrients of dairy milk which is recommended by U.S. Dietary Guidelines. Promoting milk with a generalized message can be insensitive to some populations such as those with higher prevalence of lactose intolerance or specific lifestyles like veganism. By focusing on which aspects of milk appeal to each kind of consumer this project will improve nutritional education in the state of Wisconsin and help boost milk sales.

Jingyi Huang, Department of Soil Science, UW-Madison

"Real-time soil nitrate leaching sensing for sustainable dairy production"

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Huang is an assistant professor in the Department of Soil Science at UW-Madison. His research interests include using proximal and remote sensing technology to improve understanding of soil physical processes at various temporal and spatial scales.

Project summary: This project addresses concerns about nitrate levels in groundwater. Researchers will use novel nano technologies and 3-D printing to manufacture soil sensors. They will then use soil and water samples to evaluate the accuracy of the sensors in the field under different nutrient management practices. The results of this study will support the nutrient management efforts of Wisconsin farmers and the dairy community including university researchers and extension staff. The project aims to help provide more efficient use of Nitrogen fertilizer on-farm and reduction in nutrient losses from intensive agricultural production to groundwater in Wisconsin.

Audrey Girard, Department of Food Science, UW–Madison

“Discovering a new dairy-based ingredient to replace fat in whipped cream”

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Girard joined the UW–Madison faculty in May 2021 as an assistant professor in the Department of Food Science specializing in food chemistry. Her overarching goal is to use protein chemistry to improve food quality and sustainability, as well as to promote human health. Girard grew up on a farm in northwest Kansas where she developed an innate connection to agriculture and food production.

Project summary: A major issue in the dairy cream industry is rising health concerns of consumers looking for low-fat alternatives. Many low-fat options are stabilized by ingredients that many consumers find unfamiliar. Consumers worldwide are also gravitating towards shorter, simpler ingredient lists. These evolving obstacles cannot go unaddressed. This project hypothesizes that whey protein-derived ingredients could replace the fat in cream while maintaining cream properties. This would be especially useful for production of whipped cream. This study will help dairy processors to develop low fat, reduced calorie, high protein cream-based products that enrich nutrition and enhance marketability of premium Wisconsin dairy products.

Hub-funded research introductions

Growing farm business and communities

Guilherme Rosa, Department of Animal and Dairy Sciences, UW–Madison

“DairyTrader®: A cull dairy cow price estimation app to help farmer decision-making”

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Rosa is a professor in the Department of Animal and Dairy Sciences. He teaches courses and develops research on statistical and computational tools to analyze livestock data including beef and dairy cattle, swine, poultry among others.

Project summary: Culling decisions, a key component of successful dairy farm, are a frequently faced challenge for many dairy farmers. In addition to involuntary culling of cows due to illness, injury, or infertility, farmers need to decide when and which cows should be removed from their herd and replaced by heifers of superior genetic merit. Approximately two-thirds of cull dairy cows are sold through live auctions and many farmers only learn about the price of their cow after it has been marketed. As an additional tool to help farmers with their decision making, this project is developing an app (called Dairy Trader®). Dairy Trader® will provide the prices a farmer should expect to be paid for their cull cows in real-time.

Arquimides Reyes, Department of Animal and Food Science, UW–River Falls

“Preliminary comparison of HoSim cattle vs. Angus x Holstein cattle”

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Reyes is an assistant professor of animal and food science at UW–River Falls. He was born in El Salvador on a small dairy and beef farm and started his career in the meat industry through consulting, buying, and selling meat. He then attended graduate school while working full time with an emphasis in ruminant nutrition, meat safety and quality. Reyes’ research interests include: pre-harvest food safety, the impact of management strategies on cattle efficiency and product quality, and processed meat and product development.

Project summary: UW–River Falls and the Holstein Association USA are working to provide dairy and beef farmers with research into dairy–beef feedlot performance and carcass composition that provide premiums. This information will allow farmers to increase margins by better planning genetic selection and nutrition management practices designed to increase profitability. Meanwhile, farmers who background dairy–beef calves will have the 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, the decline in dairy profitability, and the increase in requests for price information regarding the premiums or discounts received for dairy versus beef versus dairy–beef calves has sparked interest in the topic of selecting the correct breed to develop market ready animals that meet or exceed current beef cattle performance.

Austin Polebitski, civil engineering and Arghya Das, computer science, UW–Platteville

“Decision making using a platform for connecting farmers to their data”

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Polebitski is an associate professor with a focus on urban and rural water use, water resource systems management, the use of forecasting tools in decision making, and the impacts climate change will have on statewide natural resources.

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Das, an assistant professor of Software Engineering, has his Ph.D. in big data analytics and has multiple years of experiences in data–engineering and data–analysis in both industrial and academic projects.

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Project summary: The dairy community is undergoing rapid growth and change in data management and analytics. With sensing becoming increasingly accessible and inexpensive, dairies are finding new ways to optimize feed, milk production and bovine health that were not possible less than a decade ago. More technology means more data generated from different sources. This project is focused on understanding how farmers currently use their data to make decisions and analyzing how a decision support framework could influence daily operations to increase herd health and revenue. To accomplish this, a light and efficient web-based platform will be created based on discussion with partner farmers and their consultants. In addition to faculty, the research team includes local farmers and nutritionists to guide platform development and focus on ease of use, essentially getting data to a place where it is more easily stored, analyzed, and used to make decisions about farm management.

New faculty roundtable

“Meet the first faculty members funded by the Dairy Innovation Hub”

Grace Lewis, dairy processing, *UW-River Falls*

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Lewis earned her B.S. and Ph.D. in Food Science from the Pennsylvania State University. In her new role as an assistant professor at UW-River Falls and Dairy Innovation Hub Affiliate, she hopes to continue enhancing dairy protein functionality through novel processing interventions including high pressure, processing aids, and others. Her research objectives target improved human health, with applications for both the food and pharmaceutical industries.

Joe Sanford, agricultural and biological systems engineering, *UW-Platteville*

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Sanford is an assistant professor in the School of Agriculture and faculty researcher for the Dairy Innovation Hub at UW-Platteville. His research interest is in agriculture wastewater management including management of farmstead and edge of field run-off, nutrient management, precision manure application, water recovery and recycling, pathogen inactivation and transport, and emerging agricultural contaminants such as PFAS.

Kate Creutzinger, animal welfare, *UW-River Falls*

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Creutzinger joined the faculty this past August as an assistant professor specializing in dairy animal welfare. Her position is funded by the Dairy Innovation Hub and her future interests involve the improvement of dairy cattle quality of life used in various agriculture systems by developing a robust teaching and research program focused on applied behavior, welfare, and sustainability.

Luis Peña-Lévano, community economic development, *UW-River Falls*

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Peña-Lévano joined UW-River Falls in August as an assistant professor of agricultural economics with a focus on community and economic development. His previous research focused on climate change interactions with agriculture, carbon taxes, forestry sequestration and food security. As part of his new role, Peña-Lévano will establish a research and outreach program to support Wisconsin dairy farmers, agriculture start-ups, rural entrepreneurs and regional partnerships.

Zifan Wan, dairy food science and management, *UW-Platteville*

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Wan is an assistant professor in the School of Agriculture at UW-Platteville specializing in dairy food science and management with focus on product development. The goal of her research and outreach is to enrich human health and nutrition and economic sustainability of dairy farms and communities in Southwest Wisconsin. Prior to joining UW-Platteville, Wan was a postdoctoral research associate in the Department of Food Science at the University of Tennessee, Institute of Agriculture, where among other things, she focused on dairy by-products and co-products.

Joseph Pierre, human health and nutrition, *UW-Madison*

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Pierre is an assistant professor in the Department of Nutritional Sciences at UW-Madison, focusing on the links between milk components and human health, leading to new dairy products for individuals across the human life cycle consistent with “personalized nutrition”. Prior to joining UW, Pierre was an assistant professor affiliated with the Divisions of Neonatology and Pediatric Obesity in the Department of Pediatrics at the University of Tennessee, College of Medicine.

Ryan Pralle, ruminant nutrition, *UW-Platteville*

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Pralle is an assistant professor of animal and dairy science in the UW–Platteville School of Agriculture. After receiving his B.S. (2015) and Ph.D. (2020) from UW–Madison, Ryan joined UW–Platteville as a tenure-track faculty member supported by the Dairy Innovation Hub, engaging in research, outreach, and teaching. Ryan’s research interests span dairy cow nutrition and predictive analytics.

Farmer panel discussion

“Impacts of Hub research on Wisconsin dairy farms”

Chris Wilson, *Wilson Organic Farms, Cuba City*

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Wilson is a seventh-generation dairy farmer, where he manages high-level business decisions for Wilson Organic Farms, one of the largest regenerative grazing and organic farms in the Midwest. In addition to his farming role, Wilson is a commodity risk manager and financial analyst for Atten Babler Risk Management. In both his farming and financial careers, he loves to explore ideas, push boundaries and look at challenges differently. Wilson hopes to contribute to an agriculture and food system that meets the challenges of the 21st century head on so his children and future grandchildren may have a brighter future!

Andy Buttles, *Stone-Front Farm, Lancaster*

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Andy Buttles owns and manages Stone-Front Farm with his wife Lyn. Together, Andy and Lyn successfully own and manage the dairy as equal partners. The dairy is currently in the process of expanding to 1,200 cows, 1,200 youngstock and employs 25 team members. Andy is a graduate of UW–Madison and received his degree in dairy science.

Amber McComish, *McComish Family Farms and Lucky Cow Gelato, Darlington*

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Amber and her husband Joe, farm in partnership with Joe’s parents, Tim and Kim on McComish Family Farms in Darlington. Their children Hunter, 8, Killian, 6, and Meara, 3, represent the seventh generation on the Lafayette County dairy farm that has been in the McComish family since 1848, the year that Wisconsin became a state. Realizing the need to diversify because of the crisis in Wisconsin’s dairy industry, the couple relied on their Irish heritage and faith in their dreams and worked with staff from the Platteville Business Incubator to create and slowly

develop Lucky Cow Gelato, a wholesale business that sells gelato to local restaurants, gas stations and grocery stores.

Tera Montgomery, animal and dairy science, UW-Platteville (moderator)

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Montgomery is a professor of dairy and animal science in the UW-Platteville School of Agriculture and is the campus liaison for the Dairy Innovation Hub at UW-Platteville. Tera's research focused on the mechanism by which photoperiod management affects milk production and immune function in dairy cattle and dairy goats. Prior to joining UW-Platteville in 2009, was faculty at Langston University in Oklahoma and an adult education instructor in Columbus, Georgia. Her teaching goals include further development of courses in calf and heifer production as well as small ruminant dairying and she hopes to complete her cheesemaker's license. She also leads a short-term faculty-led study abroad trip to explore agriculture in Romania, Spain, and England. Tera is advisor to the Pioneer Dairy Club, coaches the Dairy Challenge team, and is the advisor for the student-managed ice cream business, Pioneer Sweets.

Dairy research facilities in CALS, virtual tour

Mike Bertram, superintendent

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Bertram is the superintendent of the Arlington Agricultural Research Station, located 20 miles north of Madison in Columbia County. At more than 2,000 acres, Arlington is UW-Madison's largest agricultural research facility and supports a broad range of agricultural and natural resources research. It is used by scientists from most of the disciplines studied at CALS and the School of Veterinary Medicine. The station consists of 13 individual units aligned to different areas of research—including dairy.

Jessica Cederquist, herd operations administrator

Emmons Blaine Dairy Cattle Center and campus Dairy Cattle Center
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Cederquist is responsible for the general oversight of the entire dairy operation across the three dairy research facilities at UW-Madison. She is also responsible for providing select

management guidance for the beef and sheep research programs. Cederquist provides coordination, and ensures compliance, for all research and teaching activities that take place in UW-Madison's dairy animal research facilities.

Nancy Esser, superintendent

Marshfield Agricultural Research Station

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Esser serves as superintendent of UW-Madison's Marshfield Agricultural Research Station (MARS), which is home to the Department of Animal and Dairy Sciences' replacement heifer program as well as the USDA's Environmentally Integrated Dairy Management Research Unit. She has a 30-year background in agricultural research, safety and production. Prior to her work at MARS, Esser managed research projects for a variety of UW-Madison faculty and spent six years working for the National Farm Medicine Center at the Marshfield Clinic as an agricultural safety specialist.

Debra Boyke, outreach program manager, Center for Dairy Research

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As the outreach program manager at CDR, Boyke manages industry relation activities, plans technical events, coordinates communication work projects and company trainings, plus she oversees all CDR communication outreach efforts. She comes to CDR with more than 35 years of dairy and agriculture experience and has a degree in dairy science with an agricultural journalism emphasis. She also serves as the executive director for the U.S. National Committee to the International Dairy Federation. Boyke's passion for the dairy community stems from her dairy farm background and her experiences working for dairy companies from pasture to plate.

Closing comments

Heather White, Faculty Director, Dairy Innovation Hub

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Heather White is an associate professor in the Department of Animal and Dairy Sciences at UW-Madison. Her research focuses on the health and nutrition of dairy cows during the transition period. In 2019, White was named faculty director of the Dairy Innovation Hub.