



STUDENTS – THE FUTURE OF OUR INDUSTRY



The UW-Madison is fortunate to have so many great students working on dairy related projects. They are the industry's future employees.

We're proud to share with you the bios of those that wish to pursue their careers in the dairy industry following graduation.



WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON



MAGGIE BECHER

M.S. Student in Food Science
University of Wisconsin-Madison



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About Me

Research: Innovative approaches to extending the shelf-life of string cheese

Advisor: Dr. John Lucey

Expected graduation date: December 2021

My Research

The goal of my research is to extend the performance shelf-life of string cheese. Stringiness, or the amount of fibrous material visible after peeling apart string cheese, decreases over the shelf life. A strong casein matrix is expected to keep the desired stringiness of string cheese intact for a longer period of time. To encourage a strong casein network, our aim is to reduce both the amount of proteolysis that occurs during storage, as well as lactic acid production, which leads to calcium solubilization and further weakening of the casein network. The effect of using high pressure processing, super chilling, lactose standardization, concentrated milk, and low-proteolytic rennet will be analyzed. It is expected that these treatments will reduce the amount of proteolysis, acid production, and calcium solubilization over time and will have a positive effect on extending the quality of the string cheese.

Internships/ Experience

2017: Valley Queen Cheese Factory- Quality Assurance, Milbank, SD

2018: Schreiber Foods- R&D, Green Bay, WI

2018: Undergraduate Research in Dairy Microbiology – South Dakota State University, Brookings, SD



More about me

I received my undergraduate degree from South Dakota State University in Food Science where I was very involved in expanding and leading the Food Science Club. I also worked in the Davis Dairy Plant on campus for a couple years making cheese and ice cream.

Away from work and school, I enjoy creating things by crocheting and quilting, and I also like to cook new recipes, especially sweets. Additionally, I enjoy spending time with my loved ones, including my dog.



SARAH ENGSTROM

Ph.D. Food Science Student, Food Research Institute (FRI)
University of Wisconsin-Madison



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About Me

Research: Development of food safety tools for manufacturers of high-risk cheese varieties

Advisor: Dr. John Lucey

Expected graduation date: Spring 2021

My Research

My research has investigated growth inhibition of *Listeria monocytogenes* in a model soft cheese system (representing soft Hispanic-style cheeses, fresh mozzarella or ricotta) using organic acids at varying pH / moisture combinations and with or without the addition of commercial clean-label antimicrobials (bacterial fermentates and protective cultures). I have additionally generated thermal lethality parameters (D- and Z-values) for *L. monocytogenes* and Shiga-toxin producing *Escherichia coli* in whole milk and compared these values with those from the scientific literature, aiming to establish validated time / temperature guidelines for milk thermization relevant to raw milk cheeses.

Jobs/Internships

2016-18: Research Specialist, UW-Madison Food Research Institute, Madison, WI

2014-16: Analyst, Microbiology/Food Safety, Oscar Mayer/Kraft Heinz, Madison, WI

2013-14: Scientist, Microbiology, Land O'Lakes, Arden Hills, MN

2010: R&D Intern, Land O'Lakes, Arden Hills, MN

2009 (spring): R&D Intern, Kraft Foods, Munich, Germany

2008, 2009 (summers): Manufacturing Intern, Oscar Mayer, Davenport, IA



More about me

Sarah Engstrom is a doctoral food science candidate at the University of Wisconsin's Food Research Institute (FRI). Sarah joined FRI in 2016 as a Research Specialist while concurrently pursuing her Ph.D., working under the direction of Dr. Kathy Glass on challenge studies with *L. monocytogenes*, *E. coli*, *Clostridium*, *Bacillus*, *Staphylococcus*, and *Salmonella* in a wide range of refrigerated and shelf-stable foods. Prior to FRI, Sarah worked as a corporate microbiologist for Oscar Mayer/Kraft Heinz from 2014-2016 and for O'Lakes from 2013-2014. Sarah received her M.S. in food science from the University of Wisconsin under the direction of Dr. Barb Ingham in 2012 and her B.S. in food science from the University of Minnesota in 2010.



YIJING GONG

M.S. Student in Food Science
University of Wisconsin-Madison



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About Me

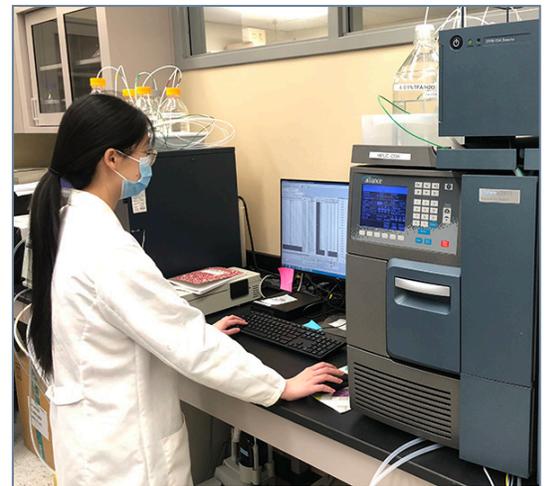
Research: High quality block Gouda cheese by direct salting

Advisor: Dr. John Lucey

Expected graduation date: May 2021

My Research

My research focuses on the quality improvement of the direct-salted block Gouda cheese. In my first phase of study, we compared two different manufacturing techniques (lactose standardization on cheese milk and whey dilution on cheese curds) in terms of controlling the cheese acidity, texture properties, meltability, and sensory performance. We found that the lactose standardization was a promising alternative to whey dilution for manufacturing direct-salted block Gouda cheese. In my second phase of study, we are exploring the impact of culture types and storage temperature on gas formation in direct-salted block Gouda cheese. The results will be presented on the CIT Research Forum this year.



Undergraduate & Previous Research

2015: Yanxiang Gao Lab, College of Food Science & Nutritional Engineering, China Agricultural University.

2016: Jere Haas Lab, Department of Nutritional Science, Cornell University.

2017: Alireza Abbaspourrad Lab, Department of Food Science, Cornell University.

More about me

I spent my first twenty years in China and studied in China Agricultural University for two years. Then I transferred to Cornell University and graduated from there with a bachelor's degree in Food Science. Now I am a master student majoring in Food Science and Computer Science and plan to graduate in May 2021. Programming helps me save time when doing statistical analysis. In my spare time, I enjoy cooking, watching movies, and biking.



MARK J. LINDSAY

Ph.D. in Chemical and Biological Engineering.
University of Wisconsin-Madison



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About Me

Research: Catalytic conversion of lactose in Greek yogurt acid whey into higher value products

Advisor: George W. Huber, Department of Chemical and Biological Engineering, UW-Madison

Expected Graduation Date: February, 2021 (flexible)

My Research

Greek yogurt acid whey is an environmental and economic problem for Greek yogurt manufacturers. I use pilot plant filtration methods to produce milk minerals, a calcium supplement, and purify the lactose in the whey. The lactose-rich stream then undergoes acid-catalyzed lactose hydrolysis, more filtration, and evaporation to produce a sweetener syrup called glucose-galactose syrup. A thorough economic analysis shows that with a feed 1,000 tons/day of Greek yogurt acid whey, this process can generate an internal rate of return (IRR) of 46% with \$13.5 million/year in profit, demonstrating the potential economic viability of the process.

Undergraduate & Internships

2016: Bachelor's in Chemical Engineering from Brigham Young University

2016: Engineering Intern, A. O. Smith Corporation, Milwaukee, WI.

2014: Engineering Intern, A. O. Smith Corporation, Milwaukee, WI.

More about me

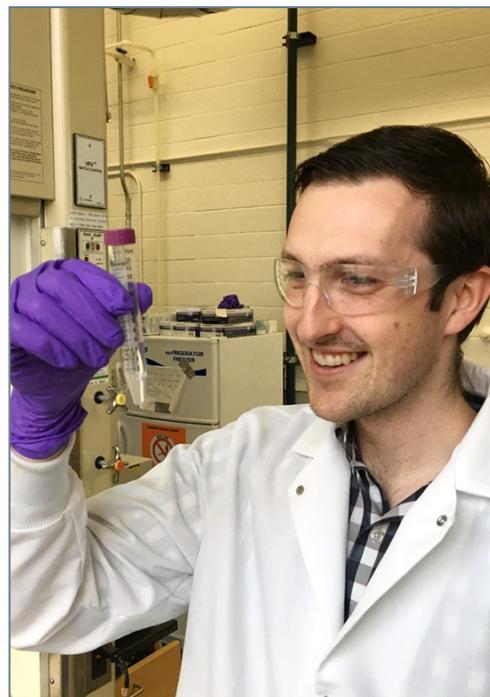
Two fields that excite me are R&D and product development. My experiences in those areas have been fulfilling, as my internship project became a marketed product in 2018 and my current research has produced two products from the dairy waste stream Greek yogurt acid whey. My engineering background combined with my knowledge of dairy processes allows me to develop novel solutions to problems in the dairy industry.

Publications and Patents

1. Mark J. Lindsay, Kefeng Huang, Brent A. Buchinger, Christos T. Maravelias, James A. Dumesic, Scott A. Rankin, George W. Huber. "Catalytic Production of Glucose-Galactose Syrup from Greek Yogurt Acid Whey in a Continuous Flow Reactor." *ChemSusChem*. 2019, 13, 791-810.

2. George W. Huber, Scott A. Rankin, Mark J. Lindsay. METHOD OF CONVERTING WHEY WASTE INTO MONOSACCHARIDES. Submitted to USPO Mar, 2018.

3. Mark J. Lindsay, Theodore W. Walker, James A. Dumesic, Scott A. Rankin and George W. Huber. "Production of monosaccharides and whey protein from acid whey waste streams in the dairy industry." *Green Chem.*, 2018, 20, 1824





SRIRUPA SEN

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About Me

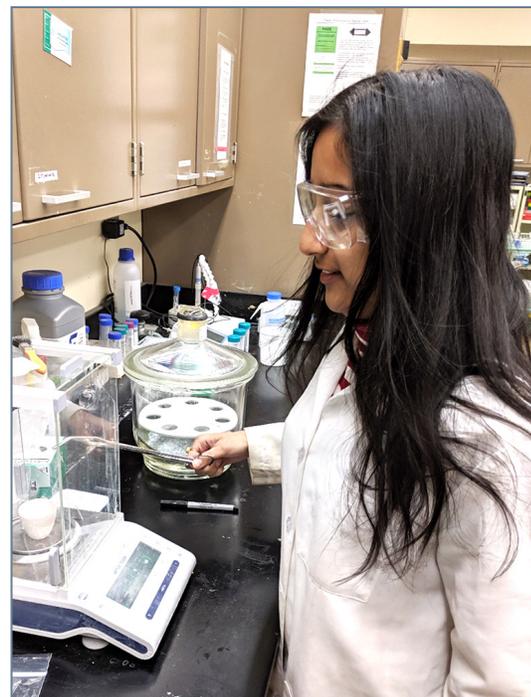
Research: Modifications to Milk Powders for Recombined Cheese Manufacture

Advisor: Dr. John A. Lucey

Expected graduation date: June 2021

My Research

Recombined cheesemaking involves the use of rehydrated milk powder as an alternative for normal milk. A conventional recombined cheesemaking process involves whey drainage and, the cheese yield is ~10%. My project aims to develop a more efficient cheesemaking process for manufacturing Panela such that, the cheese yield is much higher than 10%. Whey drainage has to be reduced/eliminated to achieve this. This would be advantageous for countries which lack proper equipment for whey drainage or whey processing. To eliminate whey drainage, we would have to start with rehydrated milk which has a total protein content similar to that of our target cheese. Panela typically has a protein content of ~20%. Commercially available high-protein milk powders (MPCs and MPIs) cannot be rehydrated to 20% protein. Thus, we manufactured a modified milk powder with partial calcium depletion and whey protein depletion. These modifications made it possible to rehydrate this customized milk powder to 20% protein. The first part of my research compares the composition and functional properties such as, solubility and rennet-induced coagulation, of some commercial high-protein milk powders with our customized powder. The second part of my project explores the potential of our customized powder in making Panela with desirable flavor and functionality using a reduced whey/ wheyless approach



Work Experience

2017: Danone Nutricia, Mumbai, India

August 2017- May 2018: Undergraduate Researcher (Protein X-Ray Crystallography Lab) at Shiv Nadar University, India

More about me

I received my undergraduate degree in Chemistry with a minor in Biotechnology from Shiv Nadar University, India. In addition to being passionate about Food Science, I love to play the piano and travel. I have spent eight years of my life in Europe and, have visited every country in West Europe.



SAM VANWEES

PhD Student in Food Science
University of Wisconsin-Madison



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About Me

Research: Physicochemical and structural properties of frozen desserts

Advisor: Dr. Rich Hartel

Expected graduation date: May 2023

My Research

Sam researches the microstructural, rheological, and interfacial properties of high-overrun ice cream and frozen desserts. As a free and zero calorie ingredient, air has potential to influence the texture and shelf stability of current products and deliver value to the frozen dessert market segment. She hopes that by researching the air interface, dairy ingredients can be optimized to add additional stability and value to high-protein, low-calorie frozen desserts.

Undergraduate & Previous Research

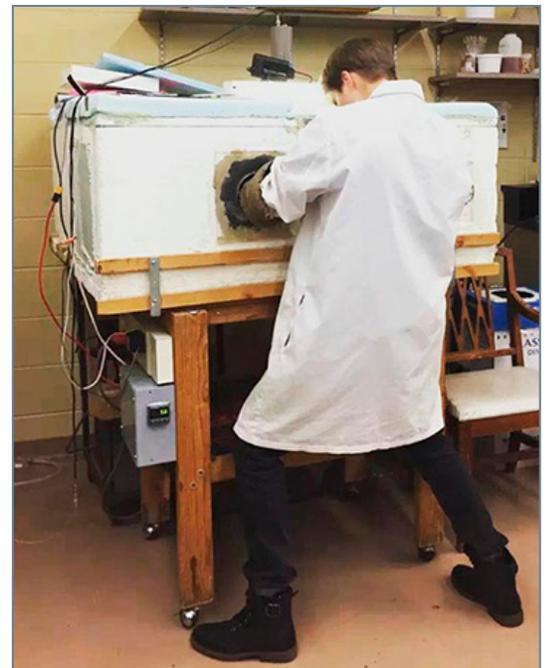
2016-Present: Graduate Research Assistant; University of Wisconsin, Madison

2018: Research and Development Intern; General Mills, Inc.

2016: Product Development Intern; Keurig Green Mountain, Inc.

2015: Food R&D Intern – Food Applications; Cargill, Inc.

2013-2016: Undergraduate Researcher, food safety and engineering lab; Cornell University



More about me

I graduated with a B.S. in food science from Cornell University in 2016 and am currently pursuing a PhD in food science at the University of Wisconsin-Madison. I research the physical chemistry of foods and the complexities of ice cream and frozen desserts. I am also heavily involved with the Institute of Food Technologists (IFT), where I served as student association President from 2019-2020, and am a third-year member of the IFT Board of Directors. Outside of the lab, I enjoy volunteering with STEM organizations, cooking, watching and playing soccer, and eating copious amounts of ice cream.



DANIEL WILBANKS

Ph.D. Student in Food Science
University of Wisconsin-Madison



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About Me

Research: Development of stable, high protein ambient yogurt beverages

Advisor: Dr. John Lucey

Expected Graduation Date: Summer 2022

My Research

I am investigating how dairy proteins interact with each other and with stabilizers in an acid environment over long storage times. I hope to leverage knowledge gained in this area to assist in creating high protein drinkable yogurt that can be stored at ambient temperature, rather than requiring refrigeration. Success on this project could lead to wider availability of high protein, nutritious dairy beverages for consumers as well as provide more export markets for dairy producers.

Undergraduate & Past Employment

2005-2008: Eastern Kentucky University - BS Forensic Science (Chemistry)

2009-2018 Mead Johnson Nutrition – Sr. QC Laboratory Tech & validation specialist

2016-2018: Kansas State University – MS Food Science

Awards & Certifications

Mead Johnson Nutrition Lean Excellence Award (2017)

Preventative Controls Qualified Individual (PCQI)



More about me

I spent nearly 10 years in Quality Control and Analytical Method Development at an infant formula manufacturer before deciding to make the switch to R&D. I enjoy tackling technical issues and problem-solving in my work, and in my spare time I enjoy hiking and camping.