



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.





MAGGIE BECHER

M.S. Food Science

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About Me

Research: Innovative approaches to extending the performance shelf-life of string cheese and fresh cheese curds

Advisor: Dr. John Lucey

Expected graduation date: Spring 2024

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 and calcium solubilization during storage which both contribute to protein breakdown and weakening of the casein matrix. The effect of using high pressure processing, low-proteolytic rennet, and different pasteurization, stretch, and storage temperatures will be analyzed. It is expected that these treatments will reduce the amount of proteolysis and calcium solubilization over time and will extend the performance of the string cheese. Future research will include understanding and extending the squeakiness of fresh cheese curds.

Internship/Experiences

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

2018: Schreiber Foods- R&D Internship, 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 cooking. Additionally, I enjoy spending time with my loved ones, including my dog.



PHILIP EBERLY

M.S. Student in Food Science

University of Wisconsin-Madison



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About Me

Research: Improving the functionality of frozen and superchilled shredded cheese during extended storage

Advisor: Dr. John Lucey

Expected graduation date: May 2023

My Research

The goal of my research is to extend the performance shelf-life of shredded low-moisture part-skim (LMPS) Mozzarella cheese through storage practices and anticaking agents. Observed defects of the frozen cheese shreds include clumping, browning/burning, watering-off, and oiling-off. It is known that storage time and temperature affect biochemical processes like calcium solubilization and proteolysis, which in turn affect the functionality of shredded LMPS Mozzarella cheese. It is also known that anticaking agents improve the functionality and shelf-life of cheese shreds by competing for free water and inhibiting electrostatic charges and molecular interactions. My aim is to understand the textural changes that occur during freezing and superchilling storage, and to explore the use of different types and concentrations of anticaking agents.

Internship/Experiences

2021: Nutrition Product Development Intern; ADM; Erlanger, KY

2020: R&D Formulation Intern; The J.M. Smucker Company; Orrville, OH

2019: Beverage Flavor Applications Intern; MANE; Lebanon, OH

2018 - 2019: Undergraduate Research Assistant; Microbial Food Safety and Spoilage Lab at The Ohio State University; Columbus, OH

2018: Quality Assurance Intern; Hilmar Cheese Company, Inc.; Hilmar, CA



More About Me

My passion for food science and the dairy industry can be traced back to growing up on my family's dairy farm in Northeast Ohio. I graduated from The Ohio State University in 2021 with a B.S. in Food Science, where I was involved in 8 student organizations and picked up a minor in agricultural communication. I enjoy practicing clear and relatable communication through my role in the National FFA Organization as a conference facilitator. In my spare time, I like to put creative spins on recipes and coordinate adventures with friends.



BENJAMIN IESALNIEKS

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About Me

Research: Improving antihypertensive properties of a natural cheese product

Advisor: Dr. Rodrigo Ibanez

Expected graduation date: Summer 2023

My Research

Hypertension continues to be a health concern throughout the United States and a leading risk factor for numerous cardiovascular diseases. With approximately 116 million U.S. adults afflicted by hypertension, causing an estimated annual economic burden of \$131 billion, management of this epidemic is essential. While antihypertensive medications are commonplace, many come with adverse side effects, creating a need for more natural therapeutics. Current research shows that food derived bioactive peptides have been known to possess some antihypertensive properties, with dairy being one of the most prevalent sources. My research is focused on producing a natural cheese containing elevated levels of antihypertensive bioactive peptides. This will be investigated with the addition of a dairy-based ingredient during cheese manufacturing and the selection of specific starter and adjunct culture strains displaying favorable proteolytic activity. In addition, the structure of dietary proteins change during digestion, effecting possible bioactive properties. Therefore, the viability of these peptides will be assessed through *in vitro* digestion modeling.



More About Me

I graduated from the University of Minnesota – Duluth in May of 2021 with a B.S in Biochemistry. While my background is rooted closely in biology and chemistry, I am eager to apply my experience in the field of food science in the coming future. In my free time, I enjoy cycling and searching out a good cup of coffee.



JOHN LARSEN

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About Me

Research: Strategies to Inhibit Development of Biogenic Amines and Associated Defects in Ripened Cheeses

Advisor: Dr. John Lucey

Expected graduation date: Spring 2023

My Research

Biogenic amines are nitrogenous degradation products generated by decarboxylation of free amino acids, which are formed during the process of cheese ripening. Their presence in foods may lead to adverse physiological reactions, as well as development of off-flavors. The goal of my research is to develop strategies for control of biogenic amines, through application of a commercial amine oxidase enzyme as well as use of adjunct cultures possessing amine oxidase activity. The first phase of my research will involve evaluation of enzyme efficacy in a synthetic cheddar cheese aqueous phase solution. Pending results, further study may proceed to determine the viability of translating this approach to cheese manufacture.



More About Me

I received my undergraduate degree in Dietetics from the University of Wisconsin Stevens Point. Following graduation, I spent three years as an analytical laboratory technician at Ocean Spray Cranberries and Tate & Lyle, and I am most interested in investigating applications for technologies to be employed in the reduction of food waste. Outside of the lab, I enjoy camping, hiking, trail running, soccer, and reading.



IRWIN PANGURIPAN

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University of Wisconsin-Madison



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About Me

Research: Late Gas Formation in Cheese Due to Biogenic Amine Formation

Advisor: Dr. John Lucey

Expected graduation date: December 2021

My Research

The goal of my research is to evaluate the potential of biogenic amine formation to cause the formation of slits or cracks in cheese. Biogenic amines are undesirable compounds that can be found in various foods. The presence of some biogenic amines are known to result in off-flavors in cheeses, and has the potential to cause harmful effects at very high amounts. The process of biogenic amine formation also results in the formation of CO₂, and we found that some strains of nonstarter lactic acid bacteria (NSLAB) produces enough biogenic amines and CO₂ to cause the formation of slits or cracks. We also found that an increase in temperatures results in a significant increase in biogenic formation.

More About Me

I received my undergraduate degree from University of Nebraska-Lincoln with a major in Food Science. Then I worked for a year as a lab technician in Neogen Geneseek, a DNA sequencing company. In my spare time, I love driving, hiking, and cooking.



JASON PRONSCHINSKE

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About Me

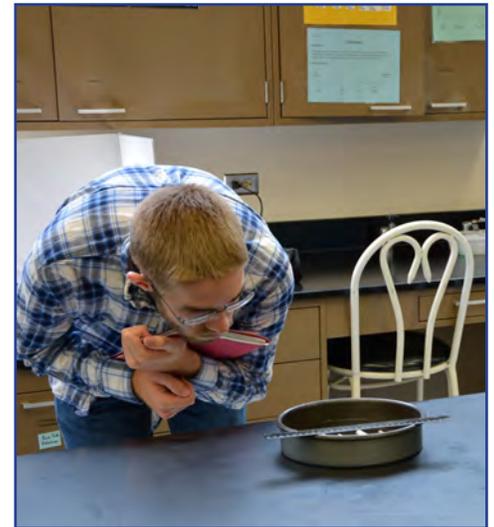
Research: Development of shelf-stable snack cheeses

Advisor: Dr. John Lucey

Expected graduation date: Fall 2023

My Research

The goal of my research is to create shelf-stable snack cheeses that can help dairy get out of the fridge and expand its presence in the snack aisle. Since current dairy snacks typically require refrigeration, they struggle to compete with more consumer-convenient snacks such as chips, crackers, and puffs. Creative manufacturing techniques and cheese formulations can be applied to tackle this issue. Currently we are looking at puffing custom-made processed cheeses in a home microwave to make a crunchy, low water activity snack. Future directions could include utilizing natural cheeses as well as extrusion to make successful products with a wide variety of textures.



More About Me

I worked in the Center for Dairy Research analytical department when I was an undergraduate at UW-Madison. Upon graduating, I joined the department full-time where I worked for 2 years before joining the Lucey Lab.

My hobbies and interests include reading, learning about naval history, and being home on the family farm. I play the alto saxophone and had a brief 2-year tenure in high school as the announcer for sporting events.



ASHLYN SCHNELL

M.S. Student in Food Science

University of Wisconsin-Madison



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About Me

Research: Controlling sedimentation during storage of high protein UHT milk beverages.

Advisor: Dr. John Lucey

Expected graduation date: Summer 2023

My Research

The goal of my research is to develop models to control sedimentation in UHT milk beverages. Ultra-high-temperature (UHT) dairy beverages are growing in popularity, especially high protein beverages. When combined with aseptic packaging, these products can be microbiologically stable for a longer shelf life, however, they are prone to defects such as sedimentation at the bottom of the container that increase during storage. Some mechanisms for sedimentation have been suggested including the formation of whey protein-kappa-casein complexes during heating causing casein micelle instability and too high a level of ionic calcium, resulting in sedimentation. It is believed that the high heat treatment used for UHT creates heat-induced calcium phosphate that then slowly solubilizes during storage, thus forming casein aggregates and sedimentation. It is expected that treatments using indirect heating, higher pH levels, and lower ionic calcium levels will reduce the amount of sedimentation formed during storage. A better understanding of the mechanism behind sedimentation will help improve product quality.



Internship/Experiences

2019- 2021: Schreiber Foods R&D Intern, Green Bay, WI

2020-2021: Research Assistant, Department of Cell Biology, University of Wisconsin-Green Bay

More About Me

I received my undergraduate degree in Biology with a Microbiology emphasis and a minor in Chemistry from the University of Wisconsin-Green Bay. During my undergraduate study, I worked for Schreiber Foods as an R&D intern. I worked with processed and natural cheese, cream cheese, yogurt, and non-dairy cheeses. Outside of work and school, I love horseback riding, running, mountain biking, and cooking.



SRIRUPA SEN

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About Me

Research: Modifications to Milk Powder Processing for Wheyless Panela Cheese Manufacture

Advisor: Dr. John Lucey

Expected graduation date: December 2021

My Research:

A conventional cheesemaking process involves whey drainage. My project aims to develop a wheyless cheesemaking process because it would be great for countries which lack proper whey handling equipment. To eliminate whey drainage, we would have to start with cheese milk with a total protein content similar to that of our target cheese. Most cheeses have a protein content of ~20%. Thus, a protein level of ~20% had to be reached in the cheese milk to produce cheese without whey drainage. We decided to use only rehydrated milk powders to boost the protein level in the cheese milk due to its several advantages. Commercially available high-protein milk powders (MPCs and MPIs) cannot be rehydrated to 20% protein due to their poor solubility. Thus, we manufactured a customized milk powder with partial calcium depletion, whey protein depletion, and the addition of monovalent ions. These modifications made it possible to rehydrate this customized milk powder to 20% protein. This powder also exhibited good rennet-coagulation properties at 20% protein. We tested the potential of this powder in manufacturing wheyless Panela cheese (a Hispanic style fresh, soft cheese). We were able to successfully manufacture a Panela-type cheese from our customized powder using a wheyless approach.



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.



AAKASH VARSHA SWAMINATHAN

Ph.D. Food Science

University of Wisconsin-Madison



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About Me

Research: Modeling functionalities of Low-moisture part skim (LMPS) Mozzarella based on calcium balances

Advisor: Dr. John Lucey

Expected graduation date: December 2023

My Research

LMPS Mozzarella, also known as pizza cheese, is of growing interest in the dairy industry. We are predicting the pizza industry to grow even more in the next decade and this calls for tailoring the functional attributes of pizza cheese such as its texture attributes including its melt, stretch, chewiness etc. Calcium balances in the cheese during manufacture is the most important factor that contributes to cheese functionality, but very little data is available on this and thus my research focuses on studying the above-mentioned topic. I plan to make lots and lots of LMPS mozzarella using various make processes including different acids, different rates, and extent of acidification, to collect and analyze data on calcium balances and its effect on cheese functionality. I further plan to build a modeling tool based on the gathered data so that the LMPS mozzarella industry can use it as a readily available tool to predict how their cheese functionality will be.

Awards/Accomplishments

2021: Recipient of the Norman F. Olson Cheese Research Scholarship

2020: Dairy Innovation Hub (DIH) student challenge

- Best of Focus Area: Enhance the shelf-life of Wisconsin dairy products, most sustainable solution, and best plan of execution

2019: 97th National Collegiate Dairy Products Evaluation Contest

- Placed first in milk, second in ice cream, and third in yogurt categories, respectively. Placed third overall for all products amongst graduate student candidates

Publication:

Swaminathan, A.V, M.S. Molitor, K.J. Burrington, D. Otter, and J.A. Lucey. 2021. A study of various chemical pre-treatments to fractionate lipids from whey protein phospholipid concentrate. *J. Dairy Sci.* 104:12249-12262.

More About Me

I graduated with a master's degree from UW-Madison in August 2019. I found my passion for dairy science while working on my master's project and decided to pursue my Ph.D. degree under the guidance of Dr. Lucey to develop a deeper understanding of dairy science and chemistry. I am very excited, and I look forward to learning more that dairy science has to offer so that I can use this very knowledge and contribute to the growth of the dairy industry. When I graduate, I would like to work in R&D, applying my knowledge, experience, and skills within the dairy products industry.





ANASTASIA TACKETT

M.S. Student in Food Science

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About Me

Research: Impact of farm environment on key bioactive components in breast milk

Advisor: Dr. John Lucey

Expected graduation date: Summer 2022

My Research

This project focuses on the association between immunologic and biochemical properties of human breast milk and the development of food allergy and atopic dermatitis in young children. To identify bioactive components in human milk, we will characterize breast milk from women of three distinct communities in Wisconsin: suburban families from the Madison area, rural families (some of which live on farms) from the Marshfield area, and Wisconsin Amish families. We will also look at how farm milk consumption may alter human breast milk composition, detailing a potential mechanism for the protective effect of farming exposure on allergic diseases. We hypothesize that maternal diet and farm exposure influence breast milk composition, and that specific immunologic and biochemical breast milk components prevent food allergy and atopic dermatitis in farm exposed children. I will be analyzing Human Milk Oligosaccharides (HMOs) amounts and major types, lactoferrin, fatty acids, types of proteins, and the fat globules of breast milk of women from farming vs. nonfarming communities. The team will also be looking at immunologic factors, including total and specific antibody levels, cytokine expression and chemokine levels, as well as microbiome data, in human breast milk from these mothers.



Internship/Experiences

2019 (summer): R&D Intern at Newly Weds Foods

2018-2020: Undergraduate Honors Thesis - *Characterization of Jasmine Rice Cultivars Grown in the United States.*

More About Me

I attended the University of Arkansas in Fayetteville for undergrad and graduated with a B.S.A in Food Science and a B.A. in Music in May 2020. During my time there I served as an ambassador for the Bumpers College of Agricultural Food and Life Sciences as well as the Food Science Club secretary. I enjoy playing the oboe, spending time with family, and baking/eating dessert! I am married to my amazing husband Chandler, and we have a little goldendoodle puppy named Teddy.



SAM VANWEES

Ph.D. Food Science
University of Wisconsin-Madison



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About Me

Research: The role of air in structure and stability 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. Air is a free and zero calorie ingredient and influences texture, structure, and stability of products, but the long-term stability of the air phase in frozen desserts is understudied. Sam aims to explain the role of dairy ingredients in forming and stabilizing the air interface in frozen desserts to optimize stability of frozen desserts and reduce defects such as shrinkage to add 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 from Cornell University with a B.S. in food science in 2016 and am currently pursuing a PhD in food science at the University of Wisconsin-Madison. I study the physical chemistry of foods and complexities of frozen desserts. I am heavily involved with the Institute of Food Technologists (IFT), and served as student association President from 2019-2020. Outside of the lab, I enjoy volunteering with STEM organizations, watching and playing soccer, embroidery, 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)

John Brandt Memorial Scholarship recipient (2021)

International Dairy Foods Association Graduate Student Award recipient (2021)



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.