



# What we do & Why it matters

## Food Science and Human Nutrition | [fshn.illinois.edu](https://fshn.illinois.edu)

The Department of Food Science and Human Nutrition implements research, education, and outreach programs designed to promote a safe, nutritious, accessible, and affordable food supply that enhances human health. The basic human need for high-quality foods for optimal health and wellness drives the core of student education as stellar faculty and exceptional students work collectively toward learning, discovering, and disseminating new knowledge and in applying novel technologies in dietetics, food science, hospitality management, and human nutrition.

### **NICKI ENGESETH (professor and department head)**

Dr. Engeseth works to ensure optimal food quality and nutritional value of the food supply by investigating the impact of environmental growing conditions, processing, and storage on produce and oilseed quality, with emphasis on enzymatic action, lipids, and natural antioxidants.

### **JAIME AMENGUAL TERRASA (associate professor)**

Dr. Amengual studies how carotenoids and vitamin A affect lipid metabolism, and how these nutrients contribute to the reduction of cardiovascular disease, atherosclerosis, and obesity. Using animal models and cell culture techniques, he explores the molecular mechanisms by which these bioactive compounds regulate cellular metabolism.

### **CLAUDIA ASENSIO (research assistant professor)**

Dr. Claudia Asensio focuses her research on exploring new sources of lipidic foods, specifically edible oils and other fat-rich food products. Her work investigates the quality and stability of these fats, looking for innovative ways to improve their extraction and preservation. Dr. Asensio is particularly interested in finding alternative natural products, such as antioxidants, to enhance the longevity and nutritional value of lipidic foods. She is passionate about understanding the sensory impact of lipid quality including how fats affect food taste, texture, and overall sensory experience.

### **PRATIK BANERJEE (associate professor & associate head for graduate programs)**

Dr. Banerjee's research program is dedicated to the study of microorganisms, both beneficial and harmful, that inhabit our food and food environments. His work focuses on safeguarding the food supply by identifying critical factors that contribute to the spread of foodborne pathogens. His laboratory employs advanced molecular methods, such as sequencing, to characterize pathogenic microorganisms, their virulence or antimicrobial resistance genes, and toxins. He also develops novel biosensors for the rapid detection of pathogens that pose health risks and threaten food safety. Additionally, Dr. Banerjee's research explores the interaction between the gut microbiome and probiotics, aiming to create dietary interventions for chronic and infectious diseases. His outreach activities include developing feasible science-based strategies to help food retailers and producers comply with food safety regulations and protect public health.

### **DAWN BOHN (teaching associate professor)**

As a Teaching Associate Professor, Dr. Bohn strives to offer her students high-level experiential learning opportunities before they enter the food industry. Her student-centered courses tackle complex and multifaceted challenges in food science and ingredient technology to develop new food and beverage products. As the Director of Faculty and Academic Engagement for the Illinois. Siebel Center for Design, Dr. Bohn aims to support, advocate for, and amplify interdisciplinary human-centered innovation, education, community, and research activities that SCD Affiliates lead on our campus, with peer institutions, and with our community and industry partners.

### **JORDEN BROTHERTON (clinical assistant professor)**

Mr. Brotherton prepares hospitality management students to become industry leaders by providing hands-on experiential learning opportunities. While operating an on-campus café and a fine dining restaurant, he guides students through the application of business strategy, food science principles, and service excellence.

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### **JENNIFER BURTON (instructor & director of the online MS program in Clinical and Community Nutrition)**

Jennifer Burton directs the online MS in Clinical & Community, Nutrition and equips nutrition professionals to translate front line research into excellence in practice. In addition to recruitment and advising of graduate students, she is bringing to life the vision for this cutting-edge program by leveraging internal and external collaborations to develop new online courses and incorporate novel experiential learning practices into her teaching.

### **KEITH CADWALLADER (professor)**

Dr. Cadwallader contributes to the understanding of fundamental and applied flavor chemistry and analysis. He identifies and characterizes key flavor (aroma) compounds, determines the interaction of flavor compounds with food matrix components, and develops methods to monitor and predict flavor changes in foods during processing and storage.

### **HONG CHEN (associate professor)**

Dr. Chen's research explores the molecular, biochemical, and nutrigenomic interactions between diet, and the gut microbiome, with a focus on maintaining gut homeostasis. By advancing our understanding of gut microbial communities in the colon, this research provides foundations for managing gut inflammation and preventing the development of colon cancer.

### **JILL CRAFT (clinical associate professor & undergraduate advisor for Hospitality Management)**

Ms. Craft ensures that hospitality management students develop problem-solving skills to critically analyze managerial issues and implement practical solutions. She teaches, develops, mentors, and advises students to be successful managers and hospitality industry professionals.

### **SUSAN COPPESS (project manager & undergraduate advisor for Nutrition and Health)**

Ms. Coppess is dedicated to supporting student success in the Department of Food Science and Human Nutrition (FSHN). As an academic advisor for Nutrition & Health, she helps students develop an academic plan that aligns with their professional goals and connects them with campus resources and co-curricular experiences tailored to their individual needs. As an instructor for FSHN first-year experiences courses, she helps students navigate their first semester by fostering a welcoming academic community and empowering them to actively explore and participate on campus.

### **ELVIRA de MEJIA (professor)**

Dr. de Mejia investigates bioactive peptides and proteins in foods that promote health benefits for reducing inflammation, markers of type 2 diabetes, cancer, and cardiovascular disease risk. She identifies and characterizes the functional properties of food components, notably flavonoids in ethnic teas, herbs, and berries.

### **SHARON DONOVAN (professor & director of the Personalized Nutrition Initiative)**

The first 1,000 days of life, spanning from conception until age 2, are of critical importance to short- and long-term health outcomes for infants and children. Dr. Donovan investigates some of the most pressing health issues facing children and families, including promoting a healthy gut, brain, and microbiome development through diet, preventing childhood obesity.

### **JOHN ERDMAN (professor emeritus)**

Dr. Erdman studies how dietary changes, such as the consumption of tomato products, reduces the risk of prostate cancer. He evaluates the metabolism of the carotenoid lycopene, the main red color in tomatoes. His team uses ultrasound techniques for early detection of prostate cancer and tumor growth as well as monitoring development of non-alcohol liver disease. He also studies how lutein, another carotenoid pigment, and vitamin E impacts brain development and function.

### **TONI GIST (clinical assistant professor)**

Toni Gist is a teaching professor who combines expertise in health, nutrition, food science, and instructional design to create engaging learning experiences for undergraduates. She collaborates with the Illini Fuel Sports Nutrition Experience, Gies College of Business, and Global Campus initiatives to enrich student learning. She also integrates AI and virtual reality to enhance engagement, accessibility, and collaboration.

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### **SAIMA HASNIN (assistant professor)**

Early childhood nutrition and health behaviors have long-lasting impacts as children grow and develop. Dr. Hasnin builds and evaluates nutrition interventions to support children's health and nutritional well-being using community-based approaches. Her Extension work includes developing evidence-based professional development materials for early childhood educators and caregivers to prevent childhood obesity, promote nutrition security, and foster sustainable food behaviors that benefit children and their caregivers alike.

### **WILLIAM HELFERICH (professor & director of Botanical Estrogen Center)**

Dr. Helferich investigates diet and breast cancer growth and progression with a specific interest on dietary components such as the soy estrogens, estrogenic dietary supplements, and how thermally abused oil can alter breast cancer metastasis using preclinical models.

### **KRYSTAL HODGE (assistant professor)**

Dr. Hodge investigates how community programs involving nutrition education and policy, systems, and environmental interventions increase food access impacting dietary patterns and subsequent health. Her research focuses on low-income audiences who are at high-risk for nutrition-related adverse health outcomes. She uses quantitative and qualitative research methods to assess participants needs and the impact of program activities on participant knowledge, attitudes, and behaviors. Her outreach activities involve the development and dissemination of evidence-based educational programs and materials tailored to audience needs and preferences.

### **HANNAH HOLSCHER (associate professor)**

Dr. Holscher studies how food influences gut microbes and human health. Using big data approaches, she studies the link between diet, gut microbes, and health. Her work is important because it informs dietary recommendations to improve health and well-being.

### **ELIZABETH JEFFERY (professor emerita)**

Dr. Jeffery studies the mechanisms by which cruciferous vegetables, such as broccoli, kale and Brussels sprouts, lower the risk of developing cancers, including liver, prostate, and colorectal cancer. She focuses on bioavailability, including the role of the microbiome, as well as how these vegetables enhance the immune system, preventing cancers and helping to maintain health during aging.

### **YONG-SU JIN (professor)**

Dr. Jin is pioneering the use of engineered microorganisms to deliver bioactive molecules and therapeutic proteins into the gut to prevent and treat gastrointestinal disease. He advances the use of engineered microorganisms for safe and sustainable production of value-added products from renewable biomass. He also optimizes genetic and metabolic processes within cells for enhanced production of target products while minimizing production of byproducts and waste.

### **JUSTINE KARDUCK (clinical associate professor & undergraduate advisor for Dietetics and Nutrition)**

Dr. Karduck directs a top-ranked accredited Didactic Program in Dietetics whose graduates achieve a 100% first-year pass rate on the national Registered Dietitian Certification Exam. As a former clinical dietitian and certified diabetes care and education specialist, she utilizes many years of experience in the field to train future registered dietitian nutritionists.

### **SIHUI MA (teaching assistant professor & undergraduate advisor for Food Science)**

Dr. Ma is dedicated to empowering young minds through quality education and personalized guidance to navigate their academic journeys and prepare for their professional lives in an ever-changing world. Striving to foster a lifelong love of learning in our students, she tailors pedagogical methods to meet the diverse needs of our student body in teaching freshman- and sophomore-level food science professional development courses, the science of food preparation, and the science of fermented food and beverage lab. She also enjoys supporting food science undergraduate students and helping students set and achieve their academic and career goals. In addition to teaching and advising, she works with faculty to prepare the annual assessment reports of the food science undergraduate program.

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### **BRAULIO MACIAS RODRIGUEZ (assistant professor)**

Dr. Macias Rodriguez examines how material structure, function, and processes interact to improve traditional foods and develop next-generation, functional, nutritious, and sustainable foods. The team uses physicochemical and material science tools to assemble food and biological building blocks into unique structures. Their current focus includes phase-change materials, colloidal and polymeric hydrogels/oleo gels, and microbial biomaterials commonly found in foods.

### **ZEYNEP MADAK-ERDOGAN (associate professor)**

Dr. Madak-Erdogan's lab investigates how environmental factors and metabolism affect cancer outcomes and maternal health. Her team develops advanced computational methods to analyze how neighborhood characteristics, stress and chemical exposures influence tumor biology and maternal-infant health outcomes. Their research has revealed how diet and nutrition affect breast cancer treatment success and identified stress signaling mechanisms in aggressive cancers. These discoveries are leading to innovative dietary and therapeutic approaches to improve cancer treatment outcomes and maternal wellbeing.

### **JESSICA MADSON (clinical associate professor & director of graduate Dietetic Internship)**

Dr. Madson mentors graduate students who participate in the dietetic internship and are pursuing the career pathway to registered dietitian nutritionist credentialing. She makes sure all interns receive the highest level of practical work-related experiences to achieve all learning competencies for success in future careers as nutrition professionals. She secures supervised practice sites that meet and exceed standards set forth by the accrediting body for the profession.

### **MICHAEL MILLER (professor)**

Dr. Miller solves problems related to various aspects of microbial metabolism and fermentation. He evaluates the microbial metabolism of dietary components in the gut to maximize health benefits for humans. He identifies microbial metabolites in fermented foods responsible for their unique health benefits. Lastly, he uses systems biology approaches to engineer fermentation microorganisms to produce value added products and designer probiotics.

### **MANABU NAKAMURA (associate professor)**

Dr. Nakamura's team has been developing and propagating EMPOWER, an innovative dietary weight-loss program to reach out to underserved populations. The EMPOWER program can provide a cure to major chronic diseases including heart disease, stroke, diabetes and hypertension that cause premature death to many.

### **SHELLY NICKOLS-RICHARDSON (professor)**

Dr. Nickols-Richardson helps individuals and families manage body weight and prevent obesity, metabolic syndrome, and osteoporosis through a variety of dietary, physical activity, and nutrition education approaches. She promotes dietary guidelines through community-based interventions and explores consumer behaviors around vegetable choice, preparation, and consumption.

### **OGUZ KAAAN OZTURK (assistant professor)**

Dr. Ozturk's interdisciplinary research leverages novel technologies, including microfluidization, ultrasound, and cold atmospheric plasma, to enhance the functional properties of proteins and protein-rich byproducts, transforming them into valuable components for innovative formulations and processes. In addition, he employs advanced food processing techniques such as high-moisture extrusion and 3D printing to develop plant- and microalgae-based alternative products. By focusing on protein functionalization and recovery and enhancement of proteins from food byproducts, his research minimizes waste, adds value to underutilized materials, and contributes to sustainable food production. Through a deep understanding of the structure-function relationships of food ingredients, his lab aims to develop healthier, higher-quality foods that meet evolving consumer needs while promoting resource efficiency and sustainability in food systems.



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### YUAN-XIANG PAN (professor)

Dr. Pan explores how epigenetic regulation shapes physiological functions and drives chronic disease development. His research focuses on identifying novel epigenomic pathways to enable personalized nutritional interventions, ultimately promoting optimal health and well-being.

### M. YANINA PEPINO (associate professor)

Dr. Pepino's research advances our understanding of how flavor perception influences ingestive behavior and nutrient metabolism. She investigates how bariatric surgery-induced weight loss affects flavor perception, eating, and drinking and how these changes alter the body's handling of alcohol and our subjective experience of it.

### CARTER PHILLIPS (instructor)

Chef Carter provides hands-on training, guidance, and mentorship while operating our two student run businesses (Bevier Café and the Spice Box). Whether in our professional kitchen or a classroom environment he strives to create structured learning experiences that blend theory with practice. Ensuring students gain a deep understanding of food science, safety, and leadership. Chef is also involved in fighting campus food insecurity through the "Everybody Eats" program and grows produce in an aquaponics system.

### SHELLY SCHMIDT (professor)

As a researcher, Dr. Schmidt employs a wide array of techniques and strategies to characterize the physical and chemical properties of food materials to help the food industry, as well as consumers, produce safe, nutritious, and high-quality food products. As a teacher, Dr. Schmidt is devoted to helping students 1) develop and mature as scientists and 2) become life-long learners and global citizens that make a difference.

### MARCIA SIEGEL (research assistant professor)

Dr. Siegel's research focuses on the development of nutritional strategies that will ultimately result in the optimization of infant health. The research involves the study of breast milk components and their impact on the development of the gastrointestinal tract and immune system.

### MATTHEW STASIEWICZ (associate professor)

Dr. Stasiewicz tries to help people make better food safety decisions. His group uses statistics, computer simulations, and innovative laboratory methods to advance food safety risk assessment and management. The broad goal is to help the food system feed more people without them getting sick.

### PAWAN TAKHAR (professor)

Dr. Takhar utilizes polymer mechanics coupled with the movement of heat, fluids and species in porous biopolymeric matrices. He develops and solves multiscale mathematical models to improve the quality and safety of food and biomaterials.

### PABLO TORRES AGUILAR (assistant professor)

Dr. Torres Aguilar's research focuses on food security at the local, national, and international level. His position as Army Reservist has allowed him to understand the limitations and nutritional needs of enlisted soldiers resulting in reduced food security for them and their families. He uses survey tools, nutritional assessments, and biochemical indicators to measure nutritional adequacy and creates targeted public health interventions to reduce the burden of food insecurity.

### DAMIR TORRICO (assistant professor)

Dr. Damir Torrico's research focuses on innovative approaches to understanding and enhancing consumer experiences with food products. His work integrates physiological responses (biometrics) to predict consumer preferences and emotional reactions to foods. He has also developed advanced methodologies to explore how environmental factors, such as those simulated using virtual and augmented reality technologies, influence the tasting experiences of products such as wine, chocolate, and other foods. Dr. Torrico's expertise extends to product innovation, particularly in creating healthier food options with reduced sugar and sodium content. His current research included investigating fermentation processes to better understand and optimize plant-based products' sensory properties.

### HAZAL TURASAN OZTURK (teaching assistant professor)

Dr. Hazal Turasan Ozturk's research focuses on developing biodegradable biosensor platforms using plant-based sources to detect food allergens and toxins, with the goal of enhancing food safety. In addition to her research, Dr. Turasan Ozturk teaches food processing and technology courses at both the undergraduate and graduate levels, where she is passionate about inspiring students and helping them apply the latest techniques in food science and technology.

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### YI-CHENG WANG (assistant professor)

Dr. Wang develops innovative engineering technologies to improve food quality, food safety, and overall sustainability. These include non-thermal technologies for food processing and storage, advanced sensing systems for monitoring food and beverage quality and detecting contaminants, and the transformation of agricultural and food waste into value-added materials and devices.

### CHANGMOU XU (assistant professor)

Dr. Xu leverages AI and data science to optimize food processing and convert agro-industrial by-products into high-value ingredients. His research specializes in precision fermentation, smart drying, and AI-driven 3D printing to create sustainable food innovations and personalized nutrition solutions. By integrating cutting-edge technologies with industry applications, he strives to enhance food quality, nutrition, and production efficiency while reducing waste.

