Department of Food Science
Purdue University

We engage in discovery-driven activities leading to innovative learning and outreach that:

- Enhance health, safety, quality, and sustainability of foods;
- Prepare the next generation of leaders in food science; and
- Address stakeholder needs

Food Chemistry, Structure and Function

BeMiller, J.N., Food Science Professor Emeritus, Ph.D., Purdue University (1959)

Starch granule structure, reactivity, and behavior. Chemical and genetic modification of starch. Structure-functional property relationships of polysaccharides. Modifications of polysaccharides. Mono- and disaccharide chemistry and modification. Light, confocal, and electron microscopy. Uses of carbohydrates in food and other industries.

Chandrasekaran, R., Food Science Professor Emeritus, Ph.D., University of Madras, India (1966)

Molecular architecture of biopolymers; structure-function relationships in proteins, carbohydrates and nucleic acids.

Hamaker, B.R., Food Science Distinguished Professor, Ph.D., Purdue University (1986)

Carbohydrates and health – slowly digestible starch and other glycemic carbohydrates to activate satiety and food intake responses in the body; dietary fiber, gut microbiota and health - modifications in fiber functionality and fermentability to support beneficial gut bacteria and positively affect health; non-gluten cereal storage proteins and their use in foods; food carbohydrate structure-function relationships and processing; international development work in cereal processing and nutrition.

Jones, O.G., Food Science Associate Professor, Ph.D., University of Massachusetts (2009)

Controlled assembly of proteins and polysaccharides for use as delivery vehicles, interfacial stabilizers, or structuring materials in food systems; Characterization of colloids, particulates, and interfaces using scattering and atomic force microscopy; Interactions between proteins, polysaccharides, and other molecules using titration, scattering, spectrometry, and calorimetry.

Liceaga, A., Food Science Assoicate Professor, Ph.D., University of British Columbia, Canada (2006)

Bioactive peptides with antioxidant, antihypertensive, antidiabetic, antimicrobial, and antiobesity activity; entomophagy and insect protein; emerging and/or novel protein applications; applied sensory evaluation of foods and beverages; vibrational (Raman) spectroscopy and microwave extraction systems.

Mauer, L.J., Food Science Professor, Ph.D., University of Minnesota (1999)

Food materials science. Water-solid interactions. Deliquescence. Crystallization. Amorphous solid dispersions. Vitamin stability. Starch gelatinization and retrogradation.

Reuhs, B.L., Food Science Associate Professor, Ph.D., University of Georgia (1994)

Research areas include food systems analyses (Pectin and Fiber) via the extraction and purification of acidic polysaccharides from the cell walls and middle lamella of plants.

Bacterial capsule, gum, and lipopolysaccharide purification and analysis for plant-microbe interaction and food safety studies. The application of HPLC, GC-MS, and NMR in structural studies of carbohydrates and polysaccharides in food processing/food chemistry and the role of polysaccharides in bacteria-legume symbiosis and vegetable-human pathogen interactions.

Santerre, C.R., Professor of Food Toxicology, Nutrition Science, Ph.D., Michigan State University (1989)

Rapid analytical measurement of organic and inorganic contaminants in foods to support risk assessment and risk communication efforts. Strategies to assess non-target analytes and establish safety limits when minimal toxicological data is available. The influence of food processing/food preparation upon food contaminants. The safety of biotech agricultural products and seafood products. Food safety education involving chemicals.

Yao, Y., Food Science Professor, Ph.D., Jiangnan University (2000)

Goal: To create methodologies & technologies for designing and using carbohydrates and other biomaterials. Research directions: (1) carbohydrate nanoparticle-based platform to enable and/or stabilize active ingredients, such as nutrients, drugs, and vaccines; (2) food safety of fresh produce, such as protecting cantaloupes from pathogen contaminations; and (3) molecular rotor as a novel probe for biopolymer analysis and evaluation.

Foods for Health

Kim, K.-H., Food Science Associate Professor, Ph.D., Rutgers University, (1999)

Dr. Kim's research focuses on the identification of dietary bioactive compounds that modulate lipid metabolism and systemic energy balance and the determination of their impact on obesity and aging using mammalian cell culture, animal models of obesity, and invertebrate model of obesity and aging.

Mattes, R.D., Nutrition Science Professor, Ph.D., Cornell University (1981); Registered Dietitian

Sensory evaluation; regulation of food intake in humans; dietary compliance; energy and macronutrient balance; human cephalic phase responses, hunger, satiety, cravings.

Oh, E. J., Food Science Assistant Professor, Ph.D., University of Illinois (2015)

Our research focuses on fermentation science and the biotechnological production of food ingredients and value-added chemicals using engineered microorganisms. Research interests include industrial fermentation processes, metabolic engineering of microorganisms, synthetic biology approaches for elucidating regulatory networks in yeast, and engineering probiotic strains for human health applications.

Reddivari, Lavanya, Food Science Assistant Professor, Ph.D., Texas A&M University (2007)

Plant food bioactive components and gut bacterial metabolism in health and low-grade inflammation-driven chronic diseases such as ulcerative colitis, Crohn's disease and colon cancer; The two-way interactions between plant bioactive compounds and gut bacteria; How these interactions modulate bioavailability, metabolism and anti-inflammatory activity of bioactive flavonoids, and the inflammatory potential of gut microbiota to improve gut barrier integrity and gut health.

Food Safety and Microbiology

Applegate, B.M., Food Science Professor, Ph.D., University of Tennessee (1997)

Detection of viable foodborne pathogens using bacteriophage; automated extraction of nucleic acids from various matrices; enumeration of microorganisms (i.e. pathogens and other organisms) using quantitative PCR; the use of bioreporters in bioelectronics; metabolic engineering; detection of problematic microorganisms in industrial environments; construction of recombinant bacterial strains to rapidly evaluate antimicrobial products; microbial ecology.

Bhunia, A.K., Food Science Professor, Ph.D., University of Wyoming (1989)

Study of microbial pathogenesis, host immune response, and bioengineered probiotics approach in mitigating foodborne pathogen infection; and detection of foodborne bacterial pathogens by mammalian cell-based biosensors and immunosensors.

Deering, A.J., Food Science Clinical Associate Professor, Ph.D., Purdue University (2010)

Internalization of human pathogenic bacteria in plants; routes of contamination that result in plants/fruits with pathogenic bacteria; interactions between human pathogenic bacteria and plants; development of novel sanitizers for the reduction of bacteria on fresh produce.

Feng, Yaohua, Food Science Assistant Professor, Ph.D., University of California (2015)

Dr. Feng is dedicated to the research and extension of human factors in the safety of food. She uses interdisciplinary tools to identify and evaluate factors that result in behavioral change among food workers and consumers, and develops food safety education interventions targeting behavioral change to increase food safety practice compliance. She is also interested in public perception of safety-enhancing food processing technologies and designing culturally-tailored communication interventions to increase consumer acceptance.

Lindemann, S.R., Food Science Assistant Professor, Ph.D., University of Iowa Carver College of Medicine, (2010)

Dietary fiber structure influences on the composition, function, and stability of the gut microbiome; Gut microbiome metabolism of dietary components and cross-talk with human physiology; Metabolic interactions and division of labor among colonic microbes in consumption of complex substrates; Genomic determinants of microbial fitness in competition for complex carbohydrates; Mechanisms by which interactions between beneficial microbes exclude pathogenic organisms and modulate inflammation in the colon.

Oliver, H. F., Food Science Professor, Ph.D. Cornell University (2009)

Development of strategies to reduce foodborne pathogen prevalence, persistence, and transmission retail food systems; international food safety research for development; sanitizer and disinfectant efficacy testing strategies.

Pruitt, R. E., Botany and Plant Pathology Professor, Ph.D. California Institute of Technology (1986)

Understanding foodborne illness associated with fresh produce. Interactions between human pathogenic bacteria and plants. Metagenomics of microbial communities associated with plants. Use of next generation sequencing technologies to enumerate microbes in foods. Use of DNA sequencing to improve accuracy of microbial diagnostics.

Food Processing and Technology Development

Butzke, C.E., Enology Professor, Ph.D., TU Berlin (University of Excellence), Germany (1992)
Improving and sustaining grape and wine quality in a changing climate.

Campanella, O.H., Food Science Professor Emeritus, Ph.D., University of Massachusetts (1987)
Food rheology, role of rheology in food processing. Food extrusion. Transport phenomena in food processing.

Corvalan, C.M., Food Science Associate Professor, Ph.D., Unive. of Litoral, Argentina (1993)
Food Science and Biological Engineering. Novel foods and innovative manufacturing technologies. Chemical engineering science. Data science for food and biological systems. Quality assurance. Environmental engineering and sustainability. Computer modeling. Material science and rheology. Thermal and fluid phenomena in food systems. Biosecurity.

Huang, J.-Y., Food Science Assistant Professor, Ph.D., University of Cambridge, U.K. (2013)
Development of green technologies to reduce water and chemical use in food processing, including physical cleaning, fouling mitigation, cold plasma and electro-membrane processes. Investigation of complex food-energy-water dynamics via life cycle assessment to promote food system sustainability that balances productivity against environmental and social impacts.

Kokini, J.L., Scholle Endowed Chair in Food Processing, Ph.D. Chemical Engineering, Carnegie Mellon University (1977)
Expertise: Rheology; Materials Science; Extrusion; numerical simulation; nanotechnology

Ladisch, M.R., ABE & BME Professor, Ph.D., Purdue University (1977)
Bioseparations (process-scale liquid chromatography, absorption, and fundamentals of multicomponent separations). Bio-nanotechnology (protein biochips, proteins at surfaces, biomimetics). Bioprocessing of renewable resources and biological materials to value-added products.

Mishra, D.K., Food Science Assistant Professor, Ph.D., Michigan State University, (2013)
Biological and mathematical validation techniques for novel thermal processing. Degradation kinetics of nutrients and microorganisms during thermal processing. Thermal properties of food materials at elevated temperatures. Smart sensors for food processing applications. Process modeling and parameter estimation.

Narsimhan, G., ABE Professor, Ph.D., Indian Institute of Technology, Kanpur,India (1979)
Swelling and pasting of starch, antimicrobial peptides, functional properties of proteins; formation, stability, and rheology of food emulsions,foams and dispersions, transport processes in particulate systems.

Nelson, P.E., Food Science Professor Emeritus, Ph.D., Purdue University (1967)
Unit operations and packaging of aseptically processed products; effect of processing and packaging on product components; essence recovery studies; tomato products composition.

Okos, M.R., ABE Professor, Ph.D., Ohio State University (1975)

Fundamental and design aspects of biochemical and food process engineering. Investigate a) mechanisms for kinetic and material changes of food and biological materials due to shear during extrusion processes and due to moisture migration during separation processes, b) simulation and design of food and biological processes, c) methodology to improve design and operation of food and biological processes to minimize energy use and waste, and d) fermentation of ethanol, flavor and other biological compounds using immobilized microbial and plant cell reactors.

San Martin-Gonzalez, F., Associate Professor, Ph.D., Washington State University (2002)

Nano and microencapsulation of bioactive compounds and natural antimicrobials based on high pressure homogenization.

Tao, B.Y., ABE Professor, Ph.D., Iowa State University (1988)

Structural/functional relationships of carbohydrate enzymes: substrate binding, kinetics, recombinant genetic expression/mutation of amylases/cyclodextrin glycosyltransferases. Modification of biomaterials for industrial applications: synthesis and characterization of surface-active agents, molecular filters, molecular chelating agents; physical/chemical properties of lipids/carbohydrates.

Xu, Qin, Food Science Research Assistant Professor, Ph.D., Purdue University (1996)

Research interest in ultrasound-assisted extraction of phenolic compounds from food industry by-products (such as potato peels, walnut shell/husk) and agricultural materials (such as kudzu) for their reutilization and environmental concern. Study of biopolymer (such as cellulose) structural/functional relationships and their process to create value-added and bio-degradable products. Development of novel technologies: 1) to process whole tomatoes for better quality products such as higher serum viscosity and lycopene content; 2) to produce bio-fuel from grains and feedstock (such as corn and cornstalk).