Food Research Institute
UNIVERSITY OF WISCONSIN–MADISON

Since 1946, a tradition of food safety leadership through research, training, and outreach

The Food Research Institute (FRI) was founded in 1946 at the University of Chicago and moved to the University of Wisconsin in 1966.

FRI aims to be an internationally recognized leader in research on microbial foodborne pathogens and toxins and a center that conducts independent research, catalyzes multidisciplinary and collaborative research, and promotes education and outreach to enhance the safety of the food supply. To fulfill this mission FRI will engage in the following food safety activities:

- Provide leadership in identifying and resolving food safety issues to meet community, government, and industry needs
- Conduct fundamental and applied research
- Provide accurate and practical information and expertise
- Deliver quality education and training

The major focus of FRI activities focus is on the microbiology of foodborne disease. The goal is to enhance the understanding of the science underlying food safety for the scientific community, government, industry, and the public to make informed decisions.

FRI is an interdepartmental interdisciplinary unit at the University of Wisconsin-Madison. Executive Committee and Affiliated Faculty have tenure homes in: the Departments of Bacteriology, Animal and Dairy Sciences, Food Science, and Plant Pathology in the College of Agricultural and Life Sciences (CALS); the Departments of Medical Microbiology and Immunology, and Pediatrics, in the School of Medicine and Public Health (SMPH); and the Departments of Medical Sciences and Pathobiological Sciences in the School of Veterinary Medicine (SVM). In addition, our faculty and staff collaborate with the Wisconsin Center for Dairy Research; Meat Science and Animal Biologics Discovery; the Molecular and Environmental Toxicology Center; the Departments of Genetics, Nutrition, Biosystems Engineering, Chemical and Biological Engineering; The Wisconsin Department of Agriculture, Trade, and Consumer protection; the Wisconsin Division of Public Health: and the Wisconsin Veterinary Diagnostic Laboratory.

FRI's funding is derived from four sources:

1. The University: which provides our building and laboratories; pays faculty salaries; and contributes to certain projects.
2. Competitively awarded government grants and contracts.
3. Industry funds for work on specific non-proprietary projects and fee-for-service projects.
4. Unrestricted gifts from companies, suppliers, and trade associations.

   Unrestricted gifts support the FRI infrastructure and provide funding for faculty to maintain research programs relevant to FRI sponsor needs. The latter is especially important because it provides resources needed to quickly respond to developing problems without having to wait for extramural support. For example, FRI supported projects on *Listeria* and *E. coli* O157:H7 were initiated and some basic questions answered almost a year before extramural support became available.

Industrial companies that support FRI provide an annual contribution based upon the annual volume of their food sales. The rate is $34.00 per million dollars in sales up to a billion dollars of food sales, or a maximum of $34,000. The minimum annual gift is $3,000.

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Sponsorship Benefits

1. FRI provides a portal to the vast resources at the University of Wisconsin-Madison campus for food safety information, including experts in microbiology, food science, animal and meat sciences, veterinary medicine, plant pathology, engineering, dairy research, food allergy, and many others.
2. Consultation with FRI faculty at no charge. Consultation requiring extensive work or travel results in a consulting fee.
3. Access to collaborative research at sponsor rate with the FRI Applied Food Safety Laboratory, which can work with *Clostridium botulinum*, *Clostridium perfringens*, *Listeria monocytogenes*, *Bacillus cereus*, *Staphylococcus aureus*, *Salmonella*, *E. coli* O157:H7, and other shiga-toxin producing *E. coli* in a variety of refrigerated and shelf-stable foods. The laboratory is a recognized process authority for pasteurized process cheese products. Sponsored research with other faculty members is welcomed and encouraged.
4. Access to literature Food Safety Reviews reviewing emerging food safety concerns, as well as customized literature reviews on specific food protection issues. There is an additional fee for extensive reviews and white paper development.
5. Rapid access to significant findings generated from FRI research through seminars and webinars, updates in newsletters, at annual and special meetings, and personal communication with FRI and affiliated faculty.
6. Multiple opportunities to participate in conferences, seminars, and webinars, including:
    - FRESH seminars during fall and spring semesters
    - FRI Annual Meeting, featuring presentations on pertinent subjects by expert speakers from other institutions and government agencies, and updates on projects being conducted by FRI faculty and staff.
    - Better Process Cheese School certification course for safe production of low-acid shelf-stable process cheese
    - Food Safety and Meat Microbiology School provides an overview of microbiology, sanitation, thermal processing, new ingredients/technologies, and demonstrations and laboratory exercises pertinent to fresh and processed meats
    - Sponsor rate registration for all conferences
7. Our e-newsletter (FRI eNews) provides concise updates on research and events at FRI and UW-Madison. Additional emails provide the latest developments on exceptional issues, upcoming events and pertinent publications affecting the food industry.
8. Third-party contact with regulatory agencies regarding issues and problems.
9. Access to well-trained graduates as potential employees.
10. A location for your employees to learn and work on problems with foodborne pathogens.
11. Access to the Sponsors Only portion of the FRI website, which includes the most current Food Safety Reviews and recorded presentations from FRESH seminars and select conferences. Contact outreach specialist Lindsey Jahn (lindsey.jahn@wisc.edu) to request access codes

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FRI Executive Committee and Affiliate Faculty

Executive Committee	
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FRI Research

FRI Research and Expertise

Microbiology
Clostridium botulinum and medical uses of its toxin
Clostridium perfringens
Bacillus cereus
Listeria and listeriosis
Salmonella
Shiga-toxin producing *E. coli*, including O157:H7
Staphylococcus aureus
Fungi and Mycotoxins
Degradation of mycotoxins in food
Cryptosporidium, *Toxoplasma*, *Cyclospora*
Novel detection systems
Stress response in foodborne pathogens
Challenge studies

Intervention strategies
Pre-harvest interventions
Traditional – Clean-label antimicrobial food ingredients
Dairy/Meat/Produce safety
Biofilm intervention
Host-Microbe interactions

Other expertise
Host response to food components/pathogens
Food allergy
Microbiome in health and disease
Alternatives to antibiotics in food animals
Statistical analysis of complex data sets
Safety issues related to produce
Probiotics

Select FRI Research Projects

Jeri Barak: How does plant infection by bacterial plant pathogens help *Salmonella enterica* survive and multiply; How do plant-eating insects spread *Salmonella* and *E. coli* from plant to plant pre-harvest; Which plant-eating insects act as biomultipliers, increasing populations and survival, of *Salmonella* and *E. coli*; Identifying *Salmonella* survival mechanisms on sprouts as targets for control strategies

Kristin Schill: Inhibition of *Clostridium botulinum*, *Staphylococcus aureus*, and *Listeria monocytogenes* on process cheese products; Enhancing the safety of refrigerated foods with clean-label antimicrobial food ingredients; Microbiological safety of foods during extended cooling; Enhancing the safety of reduced-sodium cheese and high moisture cheese; Validating growth models for *Clostridium perfringens*, *Clostridium botulinum*, and *Bacillus cereus* during extended cooling of uncured meat and poultry products; developing thermal inactivation parameters for *Listeria monocytogenes*, *Salmonella*, and other microorganisms for pasteurization and cooking validation

Chuck Kaspar: Molecular characterization of stress tolerance, population heterogeneity, and transmission of *Salmonella* and Shiga toxin-producing *E. coli*

Nancy Keller: Antimicrobial activity of fungal metabolites; Fungal/bacterial interactions that affect plant disease and toxin production; Regulators of mycotoxin production

Laura Knoll: Using next generation sequencing of the CRISPR system to create a *Toxoplasma* vaccine; Mouse models of intestinal parasitic infections

Garrett Suen: Improving milk production efficiency in dairy cows by manipulating the rumen microbiome; Microbiome characterization of mastitis in dairy cows; High-throughput detection of antimicrobial resistance genes on dairy farms; Applying next-generation sequencing to characterize unculturable microbes

JP van Pijkeren: Development of next-generation probiotics to eradicate foodborne pathogens; *Lactobacillus*-bacteriophage interactions

Jae-Hyuk Yu: Safe and effective removal of aflatoxins and patulin in food and beverage; Research and development of clean label antimicrobials using food-grade fungi

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FRI Food Safety Reviews

Food Safety Reviews are available to FRI sponsors only for the first year. To learn more about FRI sponsorship or to request your sponsor login information, contact Lindsey Jahn at lindsey.jahn@wisc.edu. ***View and access the full list of FRI reviews on our website (Scan the QR code to go directly to the list):***
https://fri.wisc.edu/resources_food_reviews.php?brief=View+all+reviews

Nov 2024: Contamination of Potatoes with Spore-forming Bacteria

Apr 2024: Volatile Compounds and Maillard Reaction

Mar 2024: Cereulide in Dairy Matrices

Mar 2024: Allergenic Potential of Ingredients Used in Plant-Based Cheese Analogs and Allergens

Jan 2024: Response to Questions Posed by the Food Safety and Inspection Service: Enhancing *Salmonella* Control in Poultry Products

Aug 2023: Cheese Brine Composition and Microbiology

Aug 2023: Examples of Antimicrobial Hurdles Used to Control Pathogens in Chilled Foods

Aug 2023: *Sporolactobacillus in Food:* Literature Discussing Prevalence and Control

Jun 2023: Thermal Inactivation of Bromelain

Jun 2023: Modified Atmosphere Packaging of Ready-to-Eat Meats

Apr 2023: Novel Non-chemical Sanitation Methods

Apr 2023: Sporistatic and Sporicidal Effects of Food Additives

Mar 2023: Isolation of Extremophiles/Acidophiles/Halophiles

Mar 2023: Nisin in Dairy Systems

Mar 2023: Pathogens associated with extra hard raw milk cheeses

Mar 2023: Nutritional content of vegetables after microwave vs. conventional pasteurization

Feb 2023: Microbiological concerns of rice starch

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FRI Undergraduate and Graduate Student Opportunities

Since 2011, FRI has coordinated the FRI Undergraduate Research Program in Food Safety for UW-Madison students seeking a B.S. degree. Each summer, FRI supports talented undergraduate students as FRI Research Scholars, who work on food safety projects in the laboratories of FRI faculty and staff, attend tutorials, and visit food processing plants.

FRI faculty and senior staff have trained hundreds of undergraduate and graduate students, post-docs, visiting scientists, and research specialists. Our alumni hold positions in industry, government, and academia across the country and abroad, where they continue to promote food safety.

FRI Awards

Each year, FRI distributes numerous awards to support the ongoing education of undergraduate and graduate students and academic staff. FRI's three graduate fellowships are among the largest and most prestigious awards distributed by FRI each year.

Dr. E Michael and Winona Foster Wisconsin Distinguished Fellowship Award		
Graduate students receiving this fellowship will receive support for one year, including tuition remission and $1,500 in flexible funding.		
2025	Xingrui Fan	Mentor: Jae-Hyuk Yu
2020	Carolina Mendoza Cavazos	Mentor: Laura Knoll
2019	Nandhitha Venkatesh	Mentor: Nancy Keller
2018	Will Olson	Mentor: Laura Knoll

Robert H. and Carol L. Deibel Distinguished Graduate Fellowship in Food Safety Research		
This fellowship supports graduate students pursuing food-safety-related research in the laboratories of faculty who are part of the executive committee or affiliated faculty of the Food Research Institute.		
2025	Yuxing Chen	Mentor: Tu-Anh Huynh
2024	Billy Erazo	Mentor: Laura Knoll
2023	Eddy Cruz (declined due to other funding)	Mentor: Johanna Elfenbein
2022	Megan Dixon	Mentor: Jeri Barak

Robert H. and Carol L. Deibel Distinguished Graduate Fellowship in Probiotic Research		
This fellowship supports graduate students pursuing research on probiotics or starter cultures in the laboratories of UW-Madison faculty.		
2025	Joie Ling	Mentor: Drew Hryckowian
2024	Mark Heggen	Mentor: JP van Pijkeren
2023	Evan Chrisler	Mentor: Vanessa Leone
2022	Marienela Heredia	Mentor: Laura Knoll

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FRI Outreach: Meetings, Training, and Seminars

FRI, in collaboration with other UW-Madison departments and other organizations, provides outreach to the scientific community through meetings, short courses, conferences, and symposia. The goal of these events is to bring individuals interested in food safety topics together, allowing for public debate and the development of relationships among scientists. Some of our past events are listed below.

Dates	Event	Comments
2005–present	FRESH seminar series	Bi-weekly seminar series each semester
2009–present	Better Process Cheese School	Presented annually
Biennial since 2010	Food Safety and Meat Microbiology School	Co-sponsored with the Master Meat Crafter Program, Dept. of Animal and Dairy Sciences, and Meat Science and Animal Biologics Discovery, UW-Madison
2025	FRI 2025 Spring Meeting	Recent public health concerns, applied food safety research, applied microbiome research in manufacturing, FRI Applied Food Safety Lab update, recent developments in foodborne toxins and allergens, and basic research of bacterial foodborne pathogens
2025	Innovations in Cleaning and Sanitation for Low Moisture Foods	Co-organized with Institute for Food Safety and Health (IFSH) and Institute for the Advancement of Food and Nutrition Sciences (IAFNS)
2024	FRI 2024 Spring Meeting	AI and food safety, natural and traditional antimicrobials, current toxicological concerns, basic research of foodborne pathogens, and applied food microbiology in manufacturing
2018 and 2023	Advanced Meat Microbiology & Food Safety for Processed Meats	Resources to manage process variations, establish thermal process, formulating foods for safety, and handling cooling deviations
2023	Data Sharing for Food Safety	Co-sponsored with the Institute for Food Safety and Health (IFSH)
2023	FRI 2023 Spring Meeting	Regulatory challenges, natural antimicrobials, epidemiology and foodborne pathogens, controlling microorganisms in reservoirs and processes, bioactive compounds, difficult-to-predict hazards in foods
2022	FRI 2022 Spring Meeting	Healthy food trends, plant-based proteins, spoilage control, *Salmonella*, surrogates for food challenge studies, microbiome
2021	FRI 2021 Spring Meeting	COVID-19 and the food industry, interactions of food microbes with the food processing environment, hot topics in food safety
2021	Environmental Controls: Emerging Technologies and Predictive Analytics to Address Complex Sanitation Challenges	Co-sponsored with the Institute for Food Safety and Health (IFSH)
2020	FRI 2020 Spring Meeting	COVID-19, control of enterics in low-moisture environments, *Salmonella*, predictive modeling, dairy and spores

Social Media

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