Opportunity Title: USDA ARS Food Safety Microbiology Postdoctoral Fellowship
Opportunity Reference Code: USDA-ARS-NEA-2025-0186

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-NEA-2025-0186

How to Apply ***To submit your application, scroll to the bottom of this opportunity and click APPLY.***

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted.
  Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations
- A copy of an abstract or reprint of an article

All documents must be in English or include an official English translation.

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Application Deadline 2/27/2026 3:00:00 PM Eastern Time Zone

Description ***Applications are reviewed on a rolling-basis.**

ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Beltsville, Maryland.

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

The mission of our research is to improve food safety and reduce foodborne illness by examining routes of contamination of fruits and vegetables with bacterial pathogens.

Research Project: The research project is focused on critical points of bacterial contamination, specifically colonization of dairy animals and contamination of dry dairy processing facilities. The participant will have the opportunity to investigate pathogen dynamics in dry dairy products within an integrated food safety systems framework. Specifically, the research focuses on high-risk bacterial pathogens: Salmonella enterica, Escherichia coli

(STECs/O157:H7), and Listeria monocytogenes. This includes characterizing pathogenic enteric bacteria on dairy farms, their ecology, and routes of transmission within the dairy herd and to milk. Under the guidance of a mentor, the participant will examine specific production environments that support bacterial pathogen survival under a variety of non-optimal growth conditions. The core research quantifies pathogen survival, competitive persistence, and niche establishment. The microbial community dynamics, specifically the interaction and competition between saprophytic vs. pathogenic enteric bacteria, will be quantified to understand their influence on long-term pathogen persistence and levels. Under guidance of the mentor, the participant will be part of all aspects of the experiment, from laboratory studies to field investigations, utilizing methodology and protocols including digital PCR (dPCR), multiplex PCR, automated nucleic acid extraction, and microbial community analysis (metagenomics/bioinformatics). The participant will also have the opportunity to be involved in the design and validation of novel, science-based interventions—such as biological controls using plant-derived bioactive compounds—to reduce pathogenic bacterial loads and mitigate virulence across the dairy supply chain. The participant will also learn about statistical analysis of data in consultation with ARS colleagues.

Learning Objectives: Under the guidance of a mentor, the participant will gain expertise in three core areas essential to modern integrated agricultural safety research focused on bacterial pathogens:

1. Bacterial Hazard Characterization and Quantification: Learn advanced molecular and non-destructive sensing methods to identify, quantify, and track the prevalence and spatial dissemination of pathogenic enteric bacteria (e.g., Salmonella, E. coli, Listeria) across dairy-related matrices (manure, water, milk contact surfaces).
2. Persistence Modeling and Risk Assessment: Develop complex ecological and kinetic models incorporating environmental, microbial community, and survival data to predict the likelihood and extent of bacterial contaminant introduction, persistence, and transfer in the dairy system.
3. Intervention Strategy Development and Optimization: Utilize advanced data analysis tools, including bioinformatics and introductory data science skills, to inform, design, and validate effective, science-based mitigation strategies, thereby optimizing production and processing guidelines for reducing pathogenic bacterial levels.

The participant will learn methods to quantify and/or determine the prevalence of bacterial pathogen loads, including Digital PCR techniques and automated nucleic acid extraction techniques, microbial community analysis, and introductory data science skills. The participant will have the opportunity to learn more in-depth statistical analysis techniques or molecular biology tools through various trainings and workshops if desired, and also through collaboration on interdisciplinary projects within ARS. The participant will have the opportunity to present data/findings at international scientific meetings related to food safety / environmental microbiology, and regional (U.S. Mid-Atlantic region) meetings as well. USDA ARS EMFSL is located in the metro-Washington, D.C. area at the Beltsville Agricultural Research Center (BARC), which provides ample interaction with ARS scientists as well as with other government research scientists and policymakers at regulatory agencies in private industry. EMFSL has a strong history of collaborating with many different academic institutions, U.S. federal government agencies on large field- and laboratory-based research, and private industry and stakeholder research projects. ORISE fellows, post-doctoral research associates and interns who have previously been at EMFSL have had success in using their experience to gain

different opportunities at the state and federal government levels, and with trade associations and in private industry.

Mentor(s): The mentors for this opportunity are Manan Sharma (manan.sharma@usda.gov) and Bradd Haley (bradd.haley@usda.gov). If you have questions about the nature of the research, please contact the mentors.

Anticipated Appointment Start Date: 2025/2026. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year but may be renewed upon recommendation of ARS and is contingent on the availability of funds.

Level of Participation: The appointment is full time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. **The anticipated stipend range is $6,277 - $6,897 monthly.**

Citizenship Requirements: This opportunity is available to U.S. citizens only.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and ARS. Participants do not become employees of USDA, ARS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please visit our Program Website. After reading, if you have additional questions about the application process, please email ORISE.ARS.Northeast@orau.org and include the reference code for this opportunity.

Qualifications

The qualified candidate should have received a doctoral degree in the one of the relevant fields. Degree must have been received within the past five years.

Preferred skills:

- Basic food or environmental microbiology skills are helpful for this fellowship (culturing and quantifying microorganisms at high and low levels from complex matrices, PCR experience, experience with water filtration or water quality is helpful).
- The ability to perform in a collaborative team research environment is highly desired.
- Organizing and formatting data for statistical analysis is an extremely valued skill in this fellowship.
- Comfortable presenting scientific data and food safety background to a

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variety of audiences with varying educational levels.
- Technical understanding of general, food and environmental microbiology coupled with the ability to analyze specific settings for pathogenic microorganisms.
- Molecular biology skills sufficient to characterize the microbial community present in dynamic settings both qualitatively and quantitatively.
- Bioinformatic and genomic analysis skills sufficient to inform changes in both pathogen and non-pathogen microbial communities.

Stipend $6,277.00 – $6,897.00 Monthly

Point of Contact Janeen

Eligibility Requirements
- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 month(s).
- **Discipline(s):**
  - **Life Health and Medical Sciences** (6 👁)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).