Shraddha Karanth

Researcher in Food Science

skm@terpmail.umd.edu
Shraddha Karanth | LinkedIn

Education

University of Maryland, Department of Nutrition and Food Science
Ph.D., Food Science (Food Safety and Microbiological Risk Assessment focus), 2021.

Dissertation: Development of machine learning and advanced data analytical techniques to incorporate genomic data in predictive modeling for *Salmonella enterica*
Committee: Abani K. Pradhan (Chair), Jianghong Meng, Jitu Patel, Adel Shirmohammadi, Seong-Ho Lee

Lund University
M.S., Biotechnology (Immunotechnology focus), 2014.
School: Lunds Tekniska Hogskola

Visvesvaraya Technological University
B.E., Biotechnology, 2011.
School: Dayananda Sagar College of Engineering

Research Interests

Research Interests: Food safety, Microbiology, Microbial risk assessment, Genome-based microbial risk assessment, Advanced microbial modeling

Methodology: Machine learning, Statistical and mathematical modeling, Microbial wet-lab and field experiments, Whole genome sequencing and analysis, Immunohistochemistry, Time lapse microscopy, Flow cytometry

Published papers

1) Shuyi Feng, Shraddha Karanth, Esam Almuhaideb,Salina Parveen and Abani K. Pradhan
Machine learning to predict the relationship between *Vibrio* spp. concentrations in seawater and oysters and prevalent environmental conditions
Food Research International, 2024

2) Edmund O. Benefo, Shraddha Karanth and Abani K. Pradhan
A machine learning approach to identifying *Salmonella* stress response genes in isolates from poultry processing
Food Research International, 2024

3) Shraddha Karanth, Shuyi Feng, Debasmita Patra and Abani K. Pradhan

Linking microbial contamination to food spoilage and food waste: the role of smart packaging, spoilage risk assessments, and date labeling
Frontiers in Microbiology, *2023*

4) Shraddha Karanth, Jitu Patel, Adel Shirmohammadi and Abani K. Pradhan.
Machine learning to predict foodborne salmonellosis outbreaks based on genome characteristics and meteorological trends
Current Research in Food Science, 2023

5) Shraddha Karanth, Edmund O. Benefo, Debasmita Patra and Abani K. Pradhan
Importance of artificial intelligence in evaluating climate change and food safety risk
Journal of Agriculture and Food Research, 2022

6) Collins K. Tanui, Edmund O. Benefo, Shraddha Karanth and Abani K. Pradhan
A machine learning model for food source attribution of *Listeria monocytogenes*
MDPI, 2022

7) Edmund O. Benefo, Shraddha Karanth and Abani K. Pradhan
Applications of advanced data analytic techniques in food safety and risk assessment
Current Opinion in Food Science, 2022

8) Shraddha Karanth and Abani K. Pradhan
Development of a novel machine learning-based weighted modeling approach to incorporate *Salmonella enterica* heterogeneity on a genetic scale in a dose-response modeling framework
Risk Analysis, 2022

9) Shraddha Karanth, Collins K. Tanui, Jianghong Meng and Abani K. Pradhan
Exploring the predictive capability of advanced machine learning in identifying severe disease phenotype in *Salmonella enterica*
Food Research International, 2021

10) Collins K. Tanui, Shraddha Karanth, Patrick M. K. Njage, Jianghong Meng and Abani K. Pradhan
Machine learning-based predictive modeling to identify genotypic traits associated with *Salmonella enterica* disease endpoints in isolates from ground chicken
LWT – Food Science and Technology, 2021

11) Hsin-Bai Yin, Chi-Hung Chen, Shraddha Karanth, Suyeun Byun, Christine Mayer, Dana Harriger, Abani Pradhan and Jitendra Patel
Effect of cultivars and irrigation waters on persistence of indicator bacteria on lettuce grown in high tunnel

Journal of Food Safety, 2020

12) Jinyao Chen, Shraddha Karanth and Abani K. Pradhan
Quantitative microbial risk assessment for Salmonella: inclusion of whole genome sequencing and genomic epidemiological studies, and advances in the bioinformatics pipeline
Journal of Agriculture and Food Research, 2020

13) Arpitha B. Mahajanakatti, Narasimha Sharma, Shraddha Karanth, Shruthi Rao, N. Rajeswari and Sinosh Skariyachan.
Structure based virtual screening of novel inhibitors against multidrug resistant superbugs
Bioinformation Journal, 2012

Book Chapters

14) Shraddha Karanth and Abani K. Pradhan
Chapter 8: Advanced data analytics and "*omics*" techniques to control enteric foodborne pathogens
In: *Advances in Food and Nutrition Research* (Sant'ana AS, ed), *2025*

15) Shraddha Karanth and Abani K. Pradhan
Chapter 29: Zoonoses – Animal meat and milk.
In: *Present Knowledge in Food Safety* (Anelich L, Boobis A, Knowles ME, Popping B, eds.), *2022*

Papers under Preparation

16) Shraddha Karanth
Artificial intelligence to predict changes in food microbial ecology in the face of rising global temperatures.

Invited talks

1) Shraddha Karanth and Abani K. Pradhan
Machine Learning and Advanced Data Analytics in Food Safety and Predictive Modeling.
Society for Risk Analysis Dose Response Specialty Group (SRA DRSG) Webinar series, 2023

2) Shraddha Karanth
Advanced Data Analytics and Machine Learning in Food Safety Risk Assessment.
Virtual course - ASM-IUSSTF: Microbial Assessment in Food Safety, 2022
NITTE University, Mangalore, India

3) Shraddha Karanth
Incorporating Molecular Data into a Risk Assessment Framework to Re-evaluate the Prevalence Estimates for *Salmonella* in Chicken.
Mini Summit on Food Safety and Sustainability, 2018
Shanghai, China

Conference / Workshop Presentations

4) Machine Learning to Identify and Predict *Salmonella* Genetic Patterns Associated with Stages of Chicken Production and Processing.
IAFP 2024, Long Beach, CA, USA

5) Shraddha Karanth and Abani K. Pradhan (2023). *Poster*
Machine Learning-based Prediction of *Salmonella* Genetic Patterns Associated with Different Stages of Chicken Production.
SRA 2023, Arlington, VA, USA

6) Shuyi Feng, Shraddha Karanth, Esam Elmuhaideb, Salina Parveen and Abani K. Pradhan (2023). *Poster*
Machine Learning to Predict Total and Pathogenic *Vibrio parahaemolyticus* Levels in Seawater and Oysters.
SRA 2023, Arlington, VA, USA

7) Shraddha Karanth, Edmund O. Benefo and Abani K. Pradhan (2023). *Oral*
Identifying Stress Response Signatures in *Salmonella enterica* Isolates Using Machine Learning and Transcriptomics Data.
IAFP 2023, Toronto, Canada

8) Shraddha Karanth, Shuyi Feng, Debasmita Patra and Abani K. Pradhan (2023). *Poster*
Spoilage and Food Waste: Assessing the Role of Predictive Modeling and Food Date Labeling.
IAFP 2023, Toronto, Canada

9) Edmund O. Benefo, Shraddha Karanth, and Abani K. Pradhan (2023). *Oral*
A Machine Learning Approach to Identifying *Salmonella* Stress Response Genes in Isolates from Poultry Processing.
IAFP 2023, Toronto, Canada (Finalist of Developing Scientist award)

10) Shuyi Feng, Shraddha Karanth, Esam Almuhaideb, Salina Parveen, and Abani K. Pradhan (2023). *Oral*
Predicting *Vibrio parahaemolyticus* prevalence in seawater and oysters using machine learning.
IAFP 2023, Toronto, Canada

11) Shraddha Karanth and Abani K. Pradhan (2022). *Poster*
Classification of *Salmonella enterica* serovar Typhimurium isolates based on stress response signatures using machine learning and transcriptomics data.
SRA 2022, Florida, USA

12) Shraddha Karanth, Jitu Patel, Adel Shirmohammadi, and Abani K. Pradhan (2022). *Oral*
Foodborne Salmonellosis Outbreak Severity Prediction Based on Genetic and Meteorological Trends Using Machine Learning.

IAFP 2022, Pittsburgh, PA, USA

13) Shraddha Karanth and Abani K. Pradhan (2022). *Poster*
Machine Learning-Based Classification of *Salmonella enterica* serovar Typhimurium Isolates Based on Transcriptomics Data Identifies Signatures of Stress Response
IAFP 2022, Pittsburgh, PA, USA

14) Shraddha Karanth and Abani K. Pradhan (2021). *Oral*
A novel machine learning-based weighted modeling approach to incorporating *Salmonella enterica* gene information in dose-response modeling
SRA 2021, Held online due to Covid-19 restrictions

15) Shraddha Karanth and Abani K. Pradhan (2021). *Poster*
Advanced data analytics to identify extrinsic and intrinsic factors influencing trends in foodborne *Salmonella* outbreaks.
SRA 2021, Held online due to Covid-19 restrictions

16) Shraddha Karanth and Abani K. Pradhan (2021). *Oral*
Development of a Novel Dose-Response Modeling Approach for *Salmonella* based on Gene Expression Data
IAFP 2021, Online presentation

17) Shraddha Karanth, Jitu Patel, Adel Shirmohammadi, and Abani K. Pradhan (2021). *Poster*
Application of Advanced Data Analytics to Analyze Effects of *Salmonella* Gene Expression on Changes in Stress Response.
IAFP 2021, Online presentation

18) Shraddha Karanth, Collins K. Tanui, Jianghong Meng and Abani K. Pradhan (2020). *Poster*
Exploring the predictive capability of advanced machine learning in identifying severe disease phenotype in *Salmonella* for application in microbial risk assessment
SRA 2020, Held online due to Covid-19 restrictions

19) Shraddha Karanth, Collins K. Tanui and Abani K. Pradhan (2020). *Poster*
Meta-analytic approach to identifying pathogenic phenotypes of *Salmonella* pathogenicity in chicken - applicability to a microbial risk assessment.
IAFP 2020, Held online due to Covid-19 restrictions

20) Shraddha Karanth, Weixin Jia and Abani K. Pradhan (2020). *Poster*
Development of a Quantitative Microbial Risk Assessment model to evaluate the public health risk of Avian Influenza H7N9 in chicken from live poultry markets.
IAFP 2020, Held online due to Covid-19 restrictions

21) Shraddha Karanth and Abani K. Pradhan (2019). *Oral*

Incorporation of whole genome sequencing data into the exposure assessment module of risk assessment: a case study for *Salmonella* in chicken.
SRA 2019; Arlington, VA, USA

22) Collins K. Tanui, Shraddha Karanth and Abani K. Pradhan (2019). *Oral*
Integrating Whole Genome Sequences into a microbial risk assessment model for *Salmonella* spp. in ground chicken.
SRA 2019; Arlington, VA, USA

23) Shraddha Karanth and Abani K. Pradhan (2019). *Poster*
Identification of phenotypic proxies for *Salmonella* pathogenicity in chicken – applicability into a risk assessment framework.
SRA 2019; Arlington, VA, USA

24) Collins K. Tanui, Shraddha Karanth and Abani K. Pradhan (2019). *Poster*
Identification of potential biomarkers and characterization of *Salmonella* strains in ground chicken using whole genome sequences (WGS).
SRA 2019; Arlington, VA, USA

25) Shraddha Karanth and Abani K. Pradhan (2019). *Oral*
Evaluating the Prevalence of *Salmonella* Virulence Gene Expression in Chicken to Incorporate into a Risk Assessment Framework.
IAFP 2019, Louisville, KY, USA

26) Shraddha Karanth and Abani K. Pradhan (2018). *Oral*
Modulating prevalence estimates for *Salmonella* in chicken using whole genome sequencing data for incorporation into a risk assessment framework.
SRA 2018; New Orleans, LA, USA

27) Shraddha Karanth and Abani K. Pradhan (2018). *Poster*
Incorporation of molecular data into a risk assessment framework to re-evaluate the prevalence estimates for *Salmonella* in chicken.
SRA 2018; New Orleans, LA, USA

28) Shraddha Karanth and Abani K. Pradhan (2018). *Poster*
Integrating Molecular Data into a Risk Assessment Framework for *Salmonella* Spp. in Poultry.
IAFP 2018; Salt Lake City, UT, USA

Awards, Fellowships and Grants

1) Society for Risk Analysis **Best Poster Award –** awarded to the top 5 posters presented at the 2023 SRA Annual Meeting (2023)
2) University of Maryland **Outstanding Graduate Student Award** – Highest award by the College of Agriculture and Natural Resources for most impactful student research (2022)

3) Society for Risk Analysis **Student Merit Award** – awarded by the Microbial Risk Analysis Specialty Group for most impactful student research (2021)
4) University of Maryland **Faculty-Student Research Award** (2020)
5) University of Maryland **Outstanding Graduate Student Award** – awarded for outstanding graduate student achievement in teaching (2020)
6) Society for Risk Analysis **Student Travel Award** (2019)
7) University of Maryland **Dean's Fellowship –** awarded by the College of Agricultural and Natural Resources (2019)
8) University of Maryland **Graduate School Summer Research Fellowship** (2019)
9) International Association for Food Protection **Student Merit Award** – awarded by the Mathematical Modeling and Risk Analysis group for most impactful student research (2019)
10) Society for Risk Analysis **Student Merit Award** – awarded by the Microbial Risk Analysis Specialty Group for most impactful student research (2018)
11) Society for Risk Analysis **Student Travel Award** (2018)
12) University of Maryland **Dean's Fellowship Award** awarded by the College of Agricultural and Natural Resources (2018)
13) University of Maryland **Graduate School Summer Research Fellowship** (2018)
14) University of Maryland **Outstanding Graduate Student Award** awarded for outstanding graduate student achievement in teaching (2018)
15) University of Maryland **Jacob K. Goldhaber Travel Grant** (2018)
16) University of Maryland **New Graduate Student Poster Award –** awarded by the Department of Nutrition and Food Science to the most impactful new student research (2017)

Teaching / Instructional Experience

Food Quality Control (NFSC431) Teaching Assistant– Spring 2020, 2019, 2018 (~20 students per year)
Food Science and Technology (NFSC112) Teaching Assistant – Fall 2020, 2019, 2018, 2017 (~150–200 students per year)
Food Microbiology (NFSC430/434) Teaching Assistant – Spring 2017 (42 students)
Elements of Nutrition (NFSC100) Teaching Assistant – Fall 2016 (~200 students)

Positions of Responsibility

President, University of Maryland Nutrition and Food Science Graduate Student Organization (2019–2020)
Graduate Student representative, Indian Association for Food Protection in North America (2018–2019)
Graduate Student mentor, UMD AGNR Summer Research Opportunity Program (2018, 2019)

Professional Experience

University of Maryland USA – Post-doctoral Research Associate (Jan. 2022–Jun. 2024)

University of Maryland USA – Graduate Assistant (Teaching / Research) (Aug. 2016–Dec. 2021)
Cactus Global India – Academic Research Editor (Freelance) (Apr. 2014–Jul. 2016)
Lund University Sweden – Graduate Research Associate (Aug. 2013–Dec. 2013)

Languages and Skills

Statistical/Machine learning: R, Python (intermediate), SAS (intermediate)
Microbiological: Microbial culture, Sampling, Biochemical analyses, Microscopy
Molecular biology: Sequencing, Cell culture, ELISA, Western blot, Flow cytometry, Immunofluorescence, Time lapse microscopy
Spoken languages: English (native/bilingual), Kannada (native/bilingual), Hindi (proficient), French (B1 level)

Certifications

FSPCA Preventive Controls for Human Food – Food Safety Preventive Controls Alliance
Whole Genome Sequencing – JIFSAN:IFTSL (Joint Institutes for Food Safety and Nutrition)
Programming for Everybody – University of Michigan (Coursera course)

Reviewer for Journals

Food Microbiology, Journal of Food Protection, Current Opinion in Food Science, Journal of Agriculture and Food Research, Preventive Veterinary Research, Heliyon

References

Prof. Abani K. Pradhan
Professor of Food Science and Director, Graduate Program in Nutrition and Food Science
Department of Nutrition and Food Science (NFSC) and Center for Food Safety and Security Systems (CFS3), University of Maryland
akp@umd.edu, +1 301 405 4502

Dr. Jitu Patel
Research Food Technologist
Environmental Microbial & Food Safety Lab
USDA, ARS, NEA, BARC, EMFSL
Jitu.patel@usda.gov, +1 301 504 7003

Prof. Adel Shirmohammadi
Professor of Water Resources and Environmental Engineering
Department of Environmental Science and Technology (ENST)
Former Associate Dean for Research and Associate Director of MAES
College of Agriculture and Natural Resources (AGNR), University of Maryland
ashirmo@umd.edu, +1 301 405 1185