

Food Microbiology Platform Overview

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FDA/CFSAN

ILLINOIS TECH



New Roles / New Faces

- Megan Fay, M.S., Goldbelt Fellow with FDA
- Neha Singh, Ph.D., Senior Scientist (Microbiology) in the IFSH Center for Processing Innovation
- Catherine Wong, Ph.D., Postdoc with Dr. Zhang

Food Microbiology Platform – Scientists

- FDA

- Megan Fay, M.S. (Goldbelt Fellow)
- Tong-Jen Fu, Ph.D.
- Elizabeth Grasso-Kelley, Ph.D.
- Bashayer Khouja, M.S. (ORISE Fellow)
- Travis Morrissey, B.S.
- Catherine Rolfe, Ph.D.
- Joelle Salazar, Ph.D.
- Arlette Shazer, M.S.
- Diane Stewart, M.S.

- IIT / IFSH

- Viviana Aguilar, M.S.
- Behzad Imanian, Ph.D.
- Lindsay Halik, B.S.
- Yuqiao Jin, Ph.D.
- Alvin Lee, Ph.D.
- Xiyang Liu, M.S.
- Nicole Maks, M.S.
- Neha Singh, Ph.D.
- Brittany Swicegood, B.S.
- Renmao Tian, Ph.D.
- Catherine Wong, Ph.D.
- Yikai Yang, M.S.
- Wei Zhang, Ph.D.
- Xinyi Zhou, Ph.D.
- Illinois Tech students & interns

Research Areas

Evaluate **preventive controls** to limit the risk of survival and contamination of microbial pathogens in foods and processing environments.

- Pathogen characteristics
- Process effects
- Detection



Microbiology & Food Technology Projects

- **Pathogen survival in ready-to-eat products**
 - Factors Affecting Growth and Survival of *Salmonella* on Packaged Fresh Peaches; PI: Stewart
 - Assessment of Population Dynamics of *Cronobacter sakazakii* and *Salmonella enterica* in Powdered and Reconstituted Infant Formula during Storage; PIs: Salazar, Stewart, Reddy, Zhang
 - Examination of *Listeria monocytogenes* Survival in Refrigerated Hard-boiled Egg-based Deli Salads Depending on Egg Treatment and Ingredients (*completed*); PIs: Fay, Stewart
 - Evaluation of Foodborne Pathogen Survival on Dehydrated and Rehydrated Enoki and Wood Ear Mushrooms (*completed*); PI: Salazar
- **Pathogen inactivation on minimally processed ready-to-eat products**
 - Evaluation of the inactivation of pathogens on noodle soup garnishes based on broth formulation and temperature; PI: Salazar
 - Efficacy of Dry-heat Treatment in Reducing *Salmonella* and *E. coli* O157:H7 Populations on Sprout Seeds; PI: Fu
 - Examination of power ultrasound and organic acid-based hurdle technology to reduce foodborne pathogens on select produce matrices (*completed*); PIs: Salazar, Zhang

Microbiology & Food Technology Projects

- **Sequencing of foodborne pathogens associated with produce**
 - Evaluation of the Microbiome of Powdered Infant Formula and Assessment of the Response of *Cronobacter sakazakii* to Desiccation and Sanitizer Stress; PIs: Salazar, Stewart, Reddy, Zhang
 - Evaluation of Viral and Bacterial Microbiomes of Leafy Greens and Herbs (*completed*); PIs: Salazar, Zhang
 - Evaluation of Strain-Specific Phenotypic and Genomic Differences on the Survival of *Listeria monocytogenes* on Selected Vegetables during Frozen and Thawed Storage (*completed*); PI: Salazar
- ***Clostridium botulinum* survival and detection**
 - *Clostridium botulinum* Challenge Study in Cold Brew Coffee Part II; PI: Morrissey
 - Evaluation of the Risk for *Clostridium botulinum* and Toxin Production in Commercial Plant-Based Meat Alternative Products; PI: Rolfe
- **Collaborations beyond OFS**
 - Evaluation *Listeria monocytogenes* in Enoki Mushrooms to Determine Localization and Growth During Vacuum Storage; Collab. Salazar with OARSA
 - Evaluation of the Incorporation of Concentrating Device – Modified Moore Swab for the Detection of *Salmonella* in Spent Sprout Irrigation Water (*completed*); Collab. Fu with ORS

Publications

1. Fay, M.L., J.K. Salazar, D.S. Stewart, B.A. Khouja, X. Zhou, and A.R. Datta. 2024. Survival of *Listeria monocytogenes* on Frozen Vegetables during Long-term Storage at -18 and -10°C. *J Food Prot.* 87(3):100224. <https://doi.org/10.1016/j.jfp.2024.100224>
2. Gurtler, J.B., C.M. Garner, E.M. Grasso-Kelley, X. Fan, and T.Z. Jin. 2024. Inactivation of Desiccation-Resistant *Salmonella* on Apple Slices following Treatment with ε-Polylysine, Sodium Bisulfate or Peracetic Acid and Subsequent Dehydration. *J Food Prot.* 87:100297. <https://doi.org/10.1016/j.jfp.2024.100297>
3. Kaushik, A., N. Kumra Taneja, V.K. Juneja, J.K. Salazar, A. Joshi, and H. Sing Oberoi. 2024. Enhancing Microbial Safety and Quality of Milk with Ultrasonication: Kinetics Modeling of Pathogenic Bacteria and Milk Characteristics. *LWT – Food Science and Technology.* <https://doi.org/10.1016/j.lwt.2024.116287>
4. Khouja, B.A., J.K. Salazar, H. Barbaria, M.L. Fay, and D.S. Stewart. 2024. Method of Inoculation Influences the Survival of *Salmonella enterica* on Fresh Retail and Orchard Peaches. *J Food Prot.* <https://doi.org/10.1016/j.jfp.2024.100289>
5. Lee, A., N. Maks-Warren, V. Aguilar, K. Piszczor, B. Swicegood, M. Ye, J. Warren, E. J. O'Neill, M. Fleck, and S. Tejayadi. 2023. Inactivation of *Salmonella*, Shiga toxin-producing *E. coli* and *Listeria monocytogenes* in Raw Diet Pet Foods using High Pressure Processing. *J Food Prot.* 86:100124. <https://doi.org/10.1016/j.jfp.2023.100124>
6. Lu, Y., S. Yang, and T.-J. Fu. 2024. Quantification of Milk Proteins in Thermally Treated Milk Samples and Commercial Food Products by ELISA Test Kits. *Food Chem.* <https://doi.org/10.1016/j.foodchem.2024.139736>
7. Lu, Yi., and T.-J. Fu. 2024. Evaluation of ELISA Test Kits for Detection of Milk Protein in Frying Oil Treated at Different Temperatures. *J Food Prot.* 87:100211. <https://doi.org/10.1016/j.jfp.2023.100211>
8. Salazar, J.K., M.L. Fay, M. Mate, X. Zhou, P. Lingareddygar, and G. Liggins. 2024. Dynamics of *Listeria monocytogenes* and *Salmonella enterica* on Cooked Vegetables during Storage. *J Food Prot.* <https://doi.org/10.1016/j.jfp.2024.100259>
9. Salazar, J.K., M.L. Fay, B.A. Khouja, N.J. Chavda, G.R. Patil, and D.T. Ingram. 2023. Effect of dehydration on the inactivation of *Listeria monocytogenes* and *Salmonella enterica* on Enoki and Wood Ear mushrooms. *Front. Microbiol.* 14:1257053. <https://doi.org/10.3389/fmicb.2023.1257053>
10. Salazar J.K., J. George, M.D., Fay, D.S. Stewart, and D.T. Ingram, 2024. Comparative Growth Kinetics of *Listeria monocytogenes* and *Salmonella enterica* on Dehydrated Enoki and Wood Ear Mushrooms during Rehydration and Storage. *Front. Microbiol.* 15:1406971. <https://doi.org/10.3389/fmicb.2024.1406971>

2023-2024 Accomplishments

Publications: 10 peer-reviewed publications

- *Journal of Food Protection, LWT – Food Science and Technology, Frontiers in Microbiology, Food Chemistry*

Presentations: >25 oral and poster presentations

- IAFP, FRI, BPCS, IFT, International Government Meetings, North Central Region FSMA Conference, Conference for Food Protection's Rehydration Committee Meeting, Illinois Tech, CARTS Close Out Reports
- Co-organize IAFP Workshop and Symposia

Committee participation:

- ISO TC 34 SC 9
- IAFP AMA PDG Chair