Food Processing Platform Overview

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Food Processing Platform - Scientists

- Jason Wan – IIT/IFSH Platform Coordinator
- Glenn Black – FDA Platform Coordinator
- Nate Anderson – FDA
- Elizabeth Grasso-Kelley – FDA
- Lauren Jackson - FDA
- Greg Fleischman – FDA PI
- Catherine Rolfe – FDA PI
- TJ Fu – FDA PI
- Diane Stewart – FDA PI
- Joelle Salazar – FDA PI
- Megan Fay – FDA ORISE
- Arlette Shazer – FDA Scientist
- Travis Morrissey – FDA PI
- Bash Khouja – FDA ORISE
- Alvin Lee – IIT/IFSH Lead & PI
- Xiyang (Sunny) Liu – IIT/IFSH PI
- Ed Steiner – IIT/IFSH Facilities
- Josh Warren – IIT/IFSH Staff
- Bairu (Alicia) Chen – IIT FDSN PhD Student
- IIT MS Students

Food Processing Platform

Objectives:

- Investigate physical/microbial effects of processing on prevention of food safety related hazards
- Identify and study parameters affecting the application of processing technologies

Food Processing Platform

Objectives:

- Validate new processing technologies
- Compare critical parameters for effectiveness of novel processing technologies versus traditional systems

IFSH Facilities Utilized
Food Processing Platform

BSL2/3 - Laboratories:

- BSL3 Capable Lab for Select Agent
  - With adjacent PP
- Multiple BSL2 Labs containing small scale processing equipment

Pilot Plants:

- Extensive GMP Pilot Plant (registered)
- Large bay Pilot Plant
  - Avure HPP
  - Allpax retort
  - Expansion bays

Food Processing Platform Samples Projects 2023-24

- The effect of geometry on heat transfer to broccoli and cauliflower florets in blanching (Fleischman)
- Effect of Temperature and Airflow on Inactivation of *Enterococcus faecium* NRRL B-2354 in Apple Cubes During Hot Air Drying (Liu)* #
- Enhancing legacy technologies (Anderson, Grasso-Kelley, Liu)*
- Factors Affecting *Salmonella* Inactivation on Apples During Hot Air Drying (Liu)*
- Isothermal Inactivation Kinetics of *Salmonella* Montevideo on Partially Dried Apple Cubes (Liu)*
- Legacy Project - Enhancing the safety of High Pressure processed juices (Lee, Black, Rolfe)* #

*Supported by USDA funding

Recently completed

Projects with Processing Milestones
Microbiology Platform

- Efficacy of Dry-heat Treatment in Reducing *Salmonella* and *E. coli* O157:H7 Populations on Sprout Seeds (Fu)
- Evaluation of Foodborne Pathogen Survival on Dehydrated and Rehydrated Enoki and Wood Ear Mushrooms (Salazar)
- Examination of *Listeria monocytogenes* Survival in Refrigerated Hard-boiled Egg-based Deli Salads Depending on Egg Treatment and Ingredients (Fay)

Recent Publications & Book Chapters

- Rolfe, C.A., N.M. Anderson, D.G. Black, and A. Lee. 2023. Barotolerance of acid-adapted and cold-adapted bacterial isolates of *E. coli* O157:H7, *Salmonella* spp., and *L. monocytogenes* in an acidic buffer model. *Journal of Food Protection*, *86*(8), 100116. https://doi.org/10.1016/j.jfp.2023.100116.

- Rolfe, C., T. Morrissey, V. Aguilar, B. Redan, G. Skinner, and N.R. Reddy. 2023. Dipicolinic Acid (DPA) Release and Heat Resistance of Nonproteolytic *C. botulinum* Type B and Type F Spores During Thermal Processing. IFT First Annual Meeting. Chicago, IL. July 16-19, 2023. Poster

- Rolfe, C., T. Morrissey, V. Aguilar, B. Redan, G. Skinner, and N.R. Reddy. 2023. Correlation between dipicolinic acid (DPA) release and heat resistance of *C. botulinum* type A and *C. sporogenes* spores during thermal processing. 2023 FDA Science Forum. Virtual. June 13-14, 2023. Poster

- Recent book chapters by Greg Fleischman:
  - Food Sterilization, in *Encyclopedia of Food Safety*, 2nd ed (Elsevier)
  - Microwave Heating: General Concerns, Myths and Realities, in *Microwave Processing of Foods* (Springer)
  - Regulatory Aspects of Microwave Heating, in *Microwave Processing of Foods* (Springer)

- Wan, J., H. Jaeger, N. Meneses, and D. Knorr. 2023. Food Technologies: Pulsed Electric Field Technology. *In: Encyclopedia of Food Safety* (Elsevier)

- Liu, X., Grasso-Kelley, E.M., Lee, A., Anderson, N.M. 2024. Isothermal Inactivation Kinetics of *Salmonella* Montevideo on Partially Dried Apple Cubes. Poster session at IAFP Annual Meeting, July 14-17, 2024, Long Beach, CA.

- Liu, X., Grasso-Kelley, E.M., Lee, A., Anderson, N.M. 2024. Factors Affecting *Salmonella* Inactivation on Apples During Hot Air Drying. Poster session at IAFP Annual Meeting, July 14-17, 2024, Long Beach, CA.