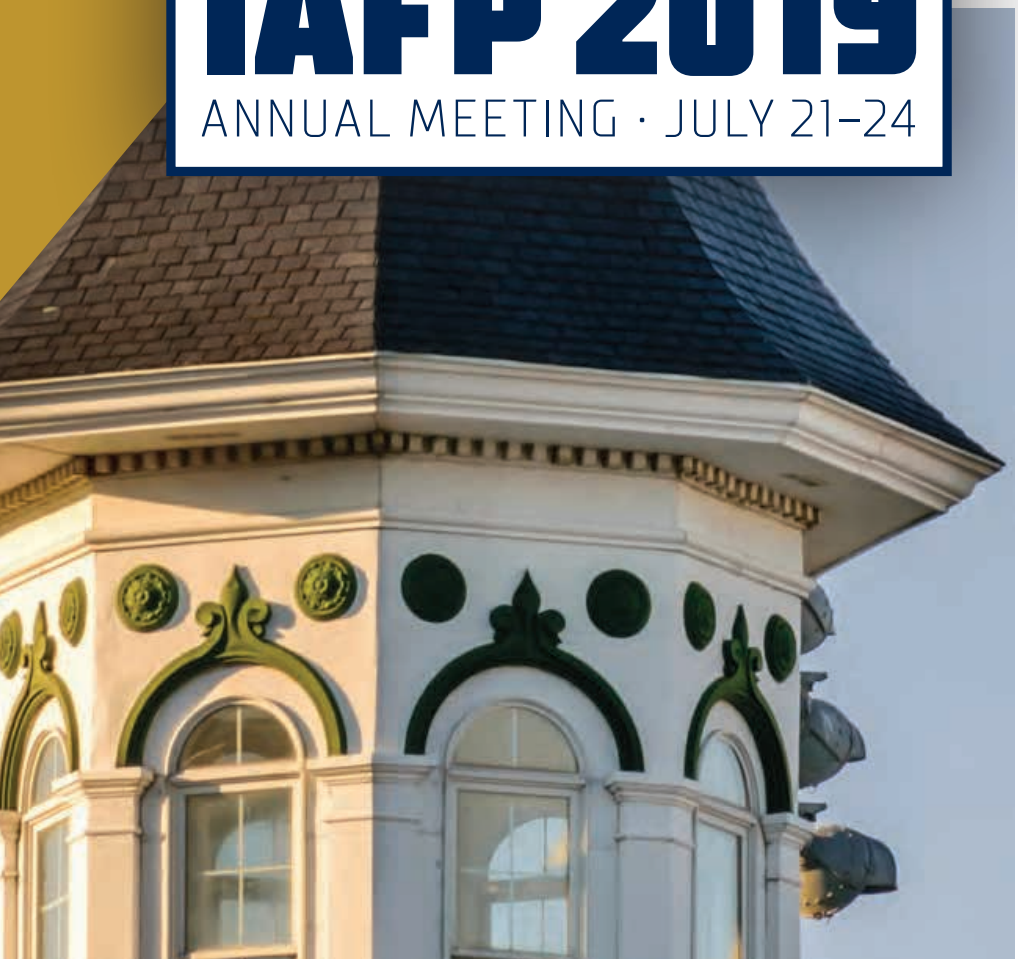
Louisville
KENTUCKY

IAFP 2019

ANNUAL MEETING · JULY 21–24



IAFP 2019

PROGRAM BOOK

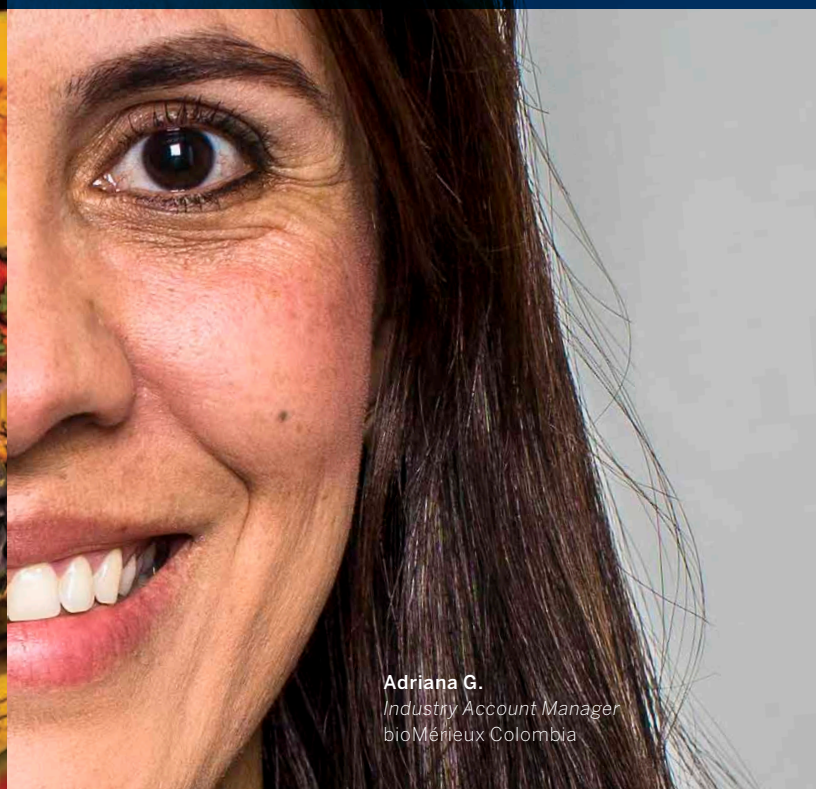
Advancing Food Safety Worldwide®

6200 Aurora Avenue, Suite 200W | Des Moines, Iowa 50322-2864, USA
+1 800.369.6337 | +1 515.276.3344 | Fax +1 515.276.8655

International Association for Food Protection®

BIOMÉRIEUX

BETTER BUSINESS THROUGH BETTER SCIENCE.



Adriana G.
Industry Account Manager
bioMérieux Colombia

Being a pioneer means being a problem solver. Sometimes, a problem can be solved with a product. Other times, a problem has to be solved by finding a new way of doing things. bioMérieux's long history of scientific advancements means we are constantly looking for new solutions. With a deep understanding of the challenges faced by industrial manufacturers, the people of bioMérieux Industry help unlock value with expert consultation and a complete line of diagnostic solutions that enable rapid, more confident results.

Let the microbiology experts at bioMérieux customize solutions to meet your unique needs. Learn more at **biomerieux-usa.com/food-safety**

PIONEERING DIAGNOSTICS

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TABLE OF CONTENTS

3M Science. Applied to Life.™

Your partner in prevention.

In partnership with Cornell University and other industry experts, 3M has developed the **Environmental Monitoring Handbook for the Food and Beverage Industries** — the first comprehensive guide to help you build and enhance your environmental monitoring program.

Learn how a holistic environmental monitoring program can help you ensure food quality and safety.

Request a digital copy at 3M.com/FoodSafety/IAFP.

WELCOME FROM THE EXECUTIVE BOARD

PRESIDENT
Timothy C. Jackson
Driscoll's of the Americas

On behalf of the Executive Board, it is my pleasure to welcome you to IAFP 2019 and to Louisville, Kentucky. Thousands of colleagues and friends from around the globe are here to experience the leading food safety conference and to help fulfill the Association's mission: To provide food safety professionals worldwide with a forum to exchange information on protecting the food supply.

Food safety remains a top priority in today's interconnected world. Our meeting will help you stay in touch with current and emerging issues, the latest science, and solutions to new and ongoing problems. Of equal or greater importance is the opportunity to network with colleagues and developing scientists...often the most valuable information one can gather is in an impromptu conversation in the hallway! Plus, we've extended our morning and afternoon breaks to allow for additional opportunities to connect with your fellow attendees. Thank you for joining us to be part of the solution for tomorrow's food safety challenges.

The Executive Board offers a special thank you to Mark Moorman, Program Committee Chair, and the entire Program Committee for organizing another exceptional lineup of symposia, roundtables, technical presentations, posters and interactive sessions. The only thing in short supply will be the time needed to attend all of the interesting presentations! Your greatest challenge will be to determine where best to spend your time, so review the program carefully and plan your time accordingly...preferably using the IAFP 2019 App!

We extend our sincere gratitude to our valued exhibitors, sponsors and long-time attendees for making each IAFP Annual Meeting highly successful every year. This meeting would not be the same without your continued and dedicated support.

Whether you are a new Member, long-time Member, student Member, or even a prospective Member, the Board eagerly welcomes you and encourages you to actively participate in this year's meeting. And if you see me, or any of our Board members, please come up and say hello. We would love to meet you.

Together, we are Advancing Food Safety Worldwide®!

Tim Jackson
IAFP President

PRESIDENT ELECT
Kalmia Kniel
University of Delaware

VICE PRESIDENT
Roger L. Cook
New Zealand Ministry
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Ruth L. Petran
Ecolab Inc.

AFFILIATE COUNCIL CHAIRPERSON
James J. O'Donnell

EXECUTIVE DIRECTOR
David W. Tharp
International Association
for Food Protection

PAST PRESIDENT
Mickey E. Parish
U.S. Food and Drug
Administration

IAFP 2019 SCHEDULE

All events held at Kentucky International Convention Center unless noted.

FRIDAY, JULY 19

IAFP Workshops

- Using Data and Statistical Analysis to Guide Food Safety Decision Making • 1 day – 8:00 a.m. – 5:00 p.m.
- Developing Environmental Monitoring Programs for Small and Midsize Processors • 2 days – 8:00 a.m. – 5:00 p.m., Friday and Saturday
- Validating Pasteurization Processes for Low-moisture Products • 1.5 days – 8:00 a.m. – 5:00 p.m., continues Saturday – 8:00 a.m. – 12:00 p.m.
- Whole Genome Sequencing: A Tutorial and Hands-on Workshop to Understand and Implement This Breakthrough Technology
  - 1.5 days – Friday, 1:00 p.m. – 5:00 p.m., continues Saturday – 8:00 a.m. – 5:00 p.m.

SATURDAY, JULY 20

IAFP Workshops

- Developing Environmental Monitoring Programs for Small and Midsize Processors • 8:00 a.m. – 5:00 p.m. (continued from Friday)
- Validating Pasteurization Processes for Low-moisture Products • 8:00 a.m. – 12:00 p.m. (continued from Friday)
- Whole Genome Sequencing: A Tutorial and Hands-on Workshop to Understand and Implement This Breakthrough Technology
  - 8:00 a.m. – 5:00 p.m. (continued from Friday)
- Introduction to FDA-iRISK® 4.0: A Comparative Risk Assessment Tool with New Features and Case Studies • 1 day – 8:00 a.m. – 5:00 p.m.
- Principles for Establishing and Extending Shelf Life • 1 day – 8:00 a.m. – 5:00 p.m.

PDG and Committee Meetings • 2:30 p.m. – 5:00 p.m.

Welcome Reception • 5:00 p.m. – 6:30 p.m. – *Sponsored by Eurofins*

SUNDAY, JULY 21

Affiliate Council Meeting • 7:00 a.m. – 10:00 a.m.
Committee and PDG Meetings • 8:00 a.m. – 5:15 p.m.
Student Luncheon (ticket required) • 12:00 p.m. – 1:30 p.m. – *Sponsored by Prometric*
Editorial Board Reception (by invitation) • 4:30 p.m. – 5:30 p.m.
Opening Session and Ivan Parkin Lecture • 6:00 p.m. – 7:30 p.m.
Cheese and Wine Reception • 7:30 p.m. – 9:30 p.m. – *Sponsored by Mars, Incorporated • Cheese donated by Land O'Lakes*
Exhibit Hours • 7:30 p.m. – 9:30 p.m.

MONDAY, JULY 22

Symposia & Technical Sessions • 8:30 a.m. – 5:15 p.m.
Poster Sessions • 8:30 a.m. – 6:15 p.m.
Exhibit Hours • 10:00 a.m. – 6:15 p.m.
Exhibit Hall Lunch • 11:45 a.m. – 1:45 p.m.
U.S. Regulatory Update • 12:30 p.m. – 1:30 p.m.
Exhibit Hall Reception • 5:15 p.m. – 6:15 p.m. – *Sponsored by Merck Animal Health*

TUESDAY, JULY 23

Committee and PDG Chairperson Breakfast (by invitation) • 7:30 a.m. – 9:00 a.m.
Symposia & Technical Sessions • 8:30 a.m. – 5:15 p.m.
Poster Sessions • 8:30 a.m. – 6:15 p.m.
Exhibit Hours • 10:00 a.m. – 6:15 p.m.
Exhibit Hall Lunch • 11:45 a.m. – 1:45 p.m.
Business Meeting • 12:30 p.m. – 1:15 p.m.
Exhibit Hall Reception • 5:15 p.m. – 6:15 p.m. – *Sponsored by Diversey*
President's Reception (by invitation) • 6:30 p.m. – 7:30 p.m. – *(Event to be held at the Omni Louisville Hotel)*
Past President's Dinner (by invitation) • 7:30 p.m. – 9:30 p.m. – *(Event to be held at the Omni Louisville Hotel)*
Student Mixer • 7:00 p.m. – 9:00 p.m. – *Sponsored by Smithfield Foods – (Event to be held at the Seelbach Hilton)*

WEDNESDAY, JULY 24

Symposia & Technical Sessions • 8:30 a.m. – 3:30 p.m.
Poster Sessions • 8:30 a.m. – 3:30 p.m.
Networking Lunch • 11:45 a.m. – 1:45 p.m.
Closing Session – John H. Silliker Lecture • 4:00 p.m. – 4:45 p.m.
Awards Reception and Banquet • 6:00 p.m. – 9:30 p.m.

GENERAL INFORMATION

Speaker-Ready Room

The Speaker-Ready Room is located in *Room M116* and is available for speakers Sunday through Wednesday, 7:00 a.m. to 5:00 p.m.

Press Release Postings

A Press Release poster board will be available in the Exhibit Hall for Press Releases. Post your Press Release for maximum exposure.

Cell Phone Policy

As a courtesy to our presenters, we request that you turn off cell phones while attending sessions. Thank you for your cooperation.

Recording Policy

Unauthorized video or audio recording will not be allowed without prior approval. By attending the IAFP Annual Meeting, you authorize IAFP to take your picture to be used in our publications.

All sessions, with speaker approval, will be audio recorded by IAFP and posted on the IAFP website for attendees' access.

Sessions sponsored by ILSI North America will be video recorded.

Meeting App

The IAFP 2019 app is available at the App Store, the Android market and through a web-based version.

Internet Café

The Internet Café is in the IAFP Registration area.

Sponsored by FSNS Food Safety Net Services

WiFi Internet

Complimentary WiFi Internet is available throughout the lobbies, Exhibit Hall, and meeting rooms. To access:

Use the IAFP2019 "WiFi" Network.
Password: iafp2019

Sponsored by hygiena

Program Committee

Chairperson

Mark Moorman, U.S. Food and Drug Administration

Vice Chairperson

Manpreet Singh, University of Georgia

Members

Laura Brown, CDC-EHSB
Doris D'Souza, University of Tennessee–Knoxville
Michelle Danyluk, University of Florida
Heidy Den Besten, Wageningen University
Martin Duplessis, Food Directorate, Health Canada
Janell Kause, USDA-FSIS
Laurie Post, Deibel Laboratories
Carrie Rigdon, Minnesota Department of Agriculture
Tori Stivers, University of Georgia
Jarret Stopforth, Kettle & Fire, Inc.
Benjamin Warren, Land O'Lakes
Pamela Wilger, Cargill, Inc.
Christina Wilson, Columbus Public Health

Board Liasons

Kali Kniel, University of Delaware
Tim Jackson, Driscoll's of the Americas

IAFP Registration Hours

Saturday, July 20 – 12:00 p.m. – 7:00 p.m.
Sunday, July 21 – 7:00 a.m. – 9:00 p.m.
Monday, July 22 – 7:30 a.m. – 5:30 p.m.
Tuesday, July 23 – 8:00 a.m. – 5:30 p.m.
Wednesday, July 24 – 8:00 a.m. – 12:00 p.m.

SCHEDULE-AT-A-GLANCE

All sessions will be held at the Kentucky International Convention Center

	Ballroom A	Ballroom C	Ballroom D	Ballroom E	Room L015	Room L017	Room M100
SUNDAY, JULY 21							
Sunday 6:00 p.m. – 7:30 p.m.	**Opening Session – Ivan Parkin Lecture** – *Ballroom C* *The Power of Play: Using Media to Educate Our Stakeholders* - Barbara Chamberlin, New Mexico State University						
MONDAY, JULY 22							
Monday 8:30 a.m. – 12:15 p.m.	S2 - Seek and You Shall Find: The Intricacies of a Robust *Listeria* Environmental Monitoring Plan	S3 - Tracing Produce: Where We are and What's Next?	S4- Water Management in Food Manufacturing: Be Prepared for Problems	S5 - Does Zero Risk Really Exist: How to Communicate Variability and Uncertainty to Government and Industry Managers			S1 - Tracking FSMA Quantitative and Qualitative Impacts on the Food Industry Under Full FDA Enforcement – Stats, Trends, Challenges and Lessons Learned
	S10 - *Listeria monocytogenes* and the Produce Industry: Best Practices for Sanitary Design, Control and Monitoring	S11 - Why are We Still Having Food Safety Failures If We All Have Food Safety Systems?	S12 - Water Re-use in the Food Processing Industry: Risk-based Approaches in Practice	RT1 - Is It Time for Food Safety Performance Standards Since Zero Risk is Not an Option?			
Monday 12:30 p.m. – 1:30 p.m.	**U.S. Regulatory Update on Food Safety** – *Ballroom C* Frank Yiannas, U.S. Food & Drug Administration (FDA) and **Mindy Brashears,** U.S. Department of Agriculture (USDA)						
Monday 1:30 p.m. – 5:15 p.m.	S18 - Is Cell Cultured Meat *Really* Meat?		S17 - Managing Large Multidisciplinary/Multi-Institutional Food Safety Projects – Effectively, Impactfully, and with Integrity	S19 - Beyond Slide Decks and Classrooms: Novel Approaches to Food Safety Learning			RT2 - Today's RTE Redefined – Managing Environmental Controls and the Risk of the "Reasonably Foreseeable"
	S24 - 2018 State and Local Foodborne Illness Investigations	RT4 - *Cyclospora* : It's Not Just an Imports' Issue		S25 - You Cannot Audit Food Safety Culture – Wrong, Here's How!			RT5 - #FoodSafety: Practical Advice for Digital Communication and Science Storytelling
TUESDAY, JULY 23							
Tuesday 8:30 a.m. – 12:15 p.m.	S30 - The Use of Rapid Microbial Methods by Government Agencies for "Official" Testing	S32 - A Precarious Balancing Act: Co-managing Preharvest Environments to Maximize Food Safety, Sustainability, and Economic Viability of Farm Operations	RT6 - Supply Chain Verification of a Sanitation Program	S33 - Emerging Hazards Associated with Seafood			S31 - New Research Findings – Control of Listeria in Dairy
		S38 - When the *Enterobacteriaceae* Hits the Fan: Wind and Particulate-associated Distribution of Foodborne Pathogens	RT7 - Home Food Delivery: The Last Mile is Not What It Used to be	S39 - What Do We Know about Microplastics in Food and Their Impact on Human Health?			
Tuesday 12:30 p.m. – 1:15 p.m.	**IAFP Business Meeting** – *M101*						
Tuesday 1:30 p.m. – 5:15 p.m.	S43 - Are There Instructions Included? The Role of Regionality and Experimental Choices on the Survival of Foodborne Pathogens in Manure-amended Soils	S44 - Updates on the Impact of Sampling Plans on Food Safety	RT9 - Challenges in Low-moisture Food Plant Sanitation – A Dairy Perspective	RT10 - Food Workers – Technology Approaches and Other Interventions for Keeping Sick People Out of the Operation	SF1 - Software Fair Presentations		S45 - Updates to the Conference for Food Protection and the Food Code
	S47 - Advancing the Science of Risk-based Criteria for Agricultural Water Quality	RT14 - The Use of Chemicals in Food Hygiene and Linkage to Microbial Resistance	RT15 - Cottage Foods: Harmonizing Food Safety Practices for a Growing Entrepreneurial Industry	S48 - Determining Preventive Controls for Viruses and Parasites	Dubai Food Watch Presentation	SF2 - Software Fair Demonstrations	RT16 - Has the Time Come for Complete Adoption of the Food Code?
WEDNESDAY, JULY 24							
Wednesday 8:30 a.m. – 12:15 p.m.	S52 - Foodborne Disease Outbreak Update		S54 - Agricultural Water and Emerging Pathogens in the Age of FSMA: Do We Need to Worry?	S55 - Environmental Monitoring – A Cost-effective Tool or Expensive Waste of Resource?	Technical Session 9 - Meat and Poultry and Seafood		S53 - The Impact of Packaging Materials on Food Safety: Testing, Modeling and Regulation
			RT21 - Food Safety and Trade: Colleagues or Competitors	S59 - Extraintestinal Pathogenic *Escherichia coli* (ExPEC): Urinary Tract Infections, Sepsis, and Avian Colibacillosis			
Wednesday 1:30 p.m. – 3:30 p.m.	S64 - Attributing Illnesses to Food Sources in the Face of Uncertainty		S65 - Safety of Animal Source Foods in Low - and Middle-income Countries	S66 - Let's Hear from Next Generation Food Safety Scientists on Pathogen Behavior in Ready-to-Eat Foods			S67 - Antibiotic Reduction, Alternatives, and the Relationship to Food Pathogen Outbreaks
Wednesday 4:00 p.m. - 4:45 p.m.	**John H. Silliker Lecture** – *Ballroom A* *From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape* – **Robert V. Tauxe**, Centers for Disease Control and Prevention						

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SPECIAL CONTRIBUTORS

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Food Safety Magazine
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University of Georgia, Center for Food Safety
University of Georgia, Marine Extension and Georgia Sea Grant
Walmart
Weber Scientific

SPECIAL PRESENTATIONS

Barbara Chamberlin, Ph.D.
Professor
New Mexico State University

SUNDAY, JULY 21

Opening Session
Ivan Parkin Lecture

The Power of Play: Using Media to Educate Our Stakeholders

6:00 p.m. – 7:30 p.m.

Join us for the IAFP 2019 Opening Session, where various awards will be presented, including the Fellow Awards, the Travel Awards, and the Student Travel Scholarship. Enjoy the Cheese and Wine Reception in the Exhibit Hall following the Opening Session.

MONDAY, JULY 22

U.S. Regulatory Update on Food Safety

12:30 p.m. – 1:30 p.m.

Don't miss the U.S. Regulatory Update on Food Safety. Experts from the U.S. Food and Drug Administration and the U.S. Department of Agriculture will provide the latest updates and changes within their respective agency, followed by a Q&A with attendees.

Frank Yiannas, MPH
Deputy Commissioner for Food Policy and Response
U.S. Food & Drug Administration (FDA)

Mindy Brashears, Ph.D.
Deputy Under Secretary for Food Safety
U.S. Department of Agriculture (USDA)

Robert V. Tauxe, MD, MPH
Director
Division of Foodborne, Waterborne and Environmental Diseases
Centers for Disease Control and Prevention

WEDNESDAY, JULY 24

Closing Session
John H. Silliker Lecture

From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape

4:00 p.m. – 4:45 p.m.

Take part in the John H. Silliker Lecture during the Closing Session. The John H. Silliker Lectureship was established in 2004 to honor Dr. Silliker's contributions to food safety through the Silliker Laboratories, now known as Mérieux NutriSciences.

EXHIBIT HALL EVENTS AND INFORMATION

CHEESE AND WINE RECEPTION

SUNDAY, JULY 21 7:30 p.m. – 9:30 p.m.

Sponsored by MARS incorporated

Cheese donated by LAND O'LAKES, INC.

EXHIBIT HALL BREAKS

MONDAY, JULY 22

10:00 a.m. Coffee Break

Sponsored by DEIBEL LABORATORIES

3:00 p.m. Coffee Break

TUESDAY, JULY 23

10:00 a.m. Coffee Break

3:00 p.m. Coffee Break

EXHIBIT HALL LUNCH

MONDAY, JULY 22 11:45 p.m. – 1:30 p.m.

TUESDAY, JULY 23 11:45 p.m. – 1:30 p.m.

EXHIBIT HALL RECEPTIONS

MONDAY, JULY 22 5:15 p.m. – 6:15 p.m.

Sponsored by MERCK Animal Health

TUESDAY, JULY 23 5:15 p.m. – 6:15 p.m.

Sponsored by Diversey

EXHIBIT HOURS

SUNDAY, JULY 21
7:30 p.m. – 9:30 p.m.

MONDAY, JULY 22
10:00 a.m. – 6:15 p.m.

TUESDAY, JULY 23
10:00 a.m. – 6:15 p.m.

30-YEAR EXHIBITORS

3-A Sanitary Standards, Inc.
3M Food Safety
Charm Sciences Inc.
Mérieux NutriSciences
Nelson-Jameson, Inc.
Weber Scientific
Whirl-Pak®

25-YEAR EXHIBITORS

bioMérieux, Inc.
Ecolab Inc.
IEH Laboratories & Consulting Group
METER Group, Inc. USA
Michelson Laboratories
Q Laboratories
Thermo Fisher Scientific

20-YEAR EXHIBITORS

API Group - LGC
FDA/CFSAN
Food Quality & Safety Magazine
Food Safety Magazine
Food Safety Summit
Hygiena
International Food & Meat Topics
Microbiologics
Microbiology International
Neogen
NSF International

15-YEAR EXHIBITORS

Bio-Rad Laboratories
Food Safety Net Services
Hardy Diagnostics
HiMedia Laboratories Pvt. Ltd.
Michigan State University Online Food Safety Program
Microbac Laboratories, Inc.
MilliporeSigma
Orkin
Procter & Gamble Professional
Quality Assurance & Food Safety Magazine
R & F Products
Springer Nature

10-YEAR EXHIBITORS

A2LA
AEMTEK, Inc.
Alpha Biosciences, Inc.
Bioscience International, Inc.
ClorDiSys Solutions, Inc.
Corning Incorporated
Eurofins Scientific
IFC
Interscience Laboratories Inc.
Matrix Sciences
National Registry of Food Safety Professionals
Neutec Group Inc.
Pall Corporation
Partnership for Food Safety Education
Romer Labs®
SAI Global
Seward Laboratory Systems, Inc.
SGS

COMMITTEE AND PDG MEETINGS

TIMES	MEETING	ROOM
SATURDAY, JULY 20, 2019		
2:30 PM – 5:00 PM	International Food Protection Issues	*Ballroom B*
3:00 PM – 5:00 PM	Committee/PDG Chairs & Vice Chairs	*M107*
3:30 PM – 4:30 PM	Past Presidents'	*M115*
SUNDAY, JULY 21, 2019		
7:00 AM –10:00 AM	Affiliate Council	L015
8:00 AM – 10:00 AM	Food Hygiene and Sanitation	*Ballroom E*
8:00 AM – 5:00 PM	Committee on Control of Foodborne Illness	*M115*
9:00 AM – 10:45 AM	Webinar	*M113*
9:00 AM – 11:00 AM	Advanced Molecular Analytics	*M100*
9:00 AM – 11:00 AM	Food Safety Assessment, Audit and Inspection	*Ballroom D*
9:00 AM – 11:00 AM	HACCP Utilization and Food Safety Systems	*M107*
9:00 AM – 11:00 AM	Pre Harvest Food Safety	*M104*
9:00 AM – 11:00 AM	Viral and Parasitic Foodborne Disease	*M108*
9:00 AM –12:00 PM	Meat and Poultry Safety and Quality	*M112*
10:00 AM –12:00 PM	3-A Committee on Sanitary Procedures	*M101*
10:00 AM –12:00 PM	*JFP* Management	*M111*
10:00 AM –12:00 PM	Student (PDG Meeting)	*Ballroom B*
10:15 AM – 12:15 PM	Food Defense	*Ballroom E*
11:00 AM – 12:00 PM	Constitution and Bylaws	*M113*
12:00 PM – 1:30 PM	Student Luncheon	*Ballroom A*
1:00 PM – 3:00 PM	Beverages and Acid/Acidifed Foods	*M108*
1:00 PM – 3:00 PM	Dairy Quality and Safety	*M100*
1:00 PM – 3:00 PM	Food Packaging	*M105*
1:00 PM – 3:00 PM	Food Safety Culture	*Ballroom E*
1:00 PM – 3:00 PM	Fruit and Vegetable Safety and Quality	*Ballroom D*
1:00 PM – 3:00 PM	Retail and Foodservice	*M107*
1:00 PM – 3:00 PM	Seafood Safety and Quality	*M101*
2:00 PM – 3:00 PM	Membership	*M109*
2:00 PM – 4:00 PM	*FPT* Management	*M111*
2:00 PM – 4:00 PM	Low Water Activity Foods	*M112*
3:15 PM – 5:15 PM	Applied Laboratory Methods	*Ballroom D*
3:15 PM – 5:15 PM	Developing Food Safety Professionals	*M100*
3:15 PM – 5:15 PM	Food Chemical Hazards and Food Allergy	*M108*
3:15 PM – 5:15 PM	Food Fraud	*M105*
3:15 PM – 5:15 PM	Food Law	*M101*
3:15 PM – 5:15 PM	Food Safety Education	*M107*
3:15 PM – 5:15 PM	Microbial Modelling and Risk Analysis	*Ballroom E*
3:15 PM – 5:15 PM	Sanitary Equipment and Facility Design	*M104*
3:15 PM – 5:15 PM	Water Safety and Quality	*M109*
4:00 PM – 5:00 PM	Nominating	*M113*

STUDENT ACTIVITIES

STUDENT PDG MEETING

SUNDAY, JULY 21

10:00 a.m. – 12:00 p.m.

Ballroom B

JOB FAIR

Attention Job Seekers and Employers!

Job announcements will be posted at the Student PDG booth.

STUDENT LUNCHEON

SUNDAY, JULY 21

12:00 p.m. – 1:30 p.m.

Ballroom A

Sponsored by Prometric

STUDENT MIXER

TUESDAY, JULY 23

7:00 p.m. – 9:00 p.m.

Seelbach Hilton, Rathskeller

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Purchase a t-shirt at the Student PDG Booth.

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Your participation in the IAFP Foundation Silent Auction is a fun way to support the IAFP Foundation.

The money raised helps to fund the programs of the IAFP Foundation including:

- Ivan Parkin Lecture
- John H. Silliker Lecture (Funded through a contribution from Mérieux NutriSciences, Inc.)
- Student Travel Scholarships for Annual Meeting
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- Travel Awards for Food Safety Professionals in Countries with Developing Economies
- Travel Support for Speakers at Global IAFP Conferences
- Developing Scientist Student Competition
- Undergraduate Student Competition
- IAFP Webinars

Silent Auction Hours

Sunday, July 21	7:30 p.m. – 9:30 p.m.
Monday, July 22	10:00 a.m. – 6:00 p.m.
Tuesday, July 23	10:00 a.m. – 3:30 p.m.

Final bids must be made by 3:30 p.m. on Tuesday.
Bid sheets will be pulled promptly at 3:30 p.m.
Successful bidders can claim items immediately following.

Located in the Exhibit Hall

IAFP FOUNDATION

All proceeds benefit the IAFP Foundation

OPENING SESSION

SUNDAY, JULY 21

Kentucky International Convention Center — 6:00 p.m.
Ballroom

WELCOME TO IAFP 2019

Tim Jackson, IAFP President

PEANUT PROUD STUDENT SCHOLARSHIP

Presented by: Darlene Cowart, Peanut Proud
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TRAVEL AWARDS

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FELLOWS AWARD

Presented by: Tim Jackson, IAFP President, and Mickey Parish, IAFP Past President

Francisco Diez-Gonzales
Linda Harris
Steve Ricke
Tori Stivers

THE IVAN PARKIN LECTURE

Introduction: Kali Kniel, IAFP President-Elect

The Power of Play: Using Media to Educate Our Stakeholders
Barbara Chamberlin, Ph.D.

CLOSING COMMENTS

Tim Jackson, IAFP President

CHEESE AND WINE RECEPTION

Sponsored by: MARS Global Food Safety Center
Cheese provided by: LAND O'LAKES, INC.

IAFP Exhibit Hall, Kentucky International Convention Center — 7:30 p.m.–9:30 p.m.

Louisville KENTUCKY
IAFP 2019
ANNUAL MEETING · JULY 21–24

IVAN PARKIN LECTURE

Sunday, July 21
Opening Session
6:00 p.m. – 7:30 p.m.

The Power of Play: Using Media to Educate Our Stakeholders

Barbara Chamberlin, Ph.D.
Professor
New Mexico State University
Las Cruces,
New Mexico, USA

Barbara Chamberlin, Ph.D., is an Extension Instructional Design and Education Media Specialist at New Mexico State University (NMSU) in Las Cruces, New Mexico. In her current position, Dr. Chamberlin directs NMSU's Learning Games Lab in the Innovative Media Research and Extension Department, leading research on game development and serving as an instructional designer on new educational projects.

NMSU's Innovative Media Research and Extension Department has an established history in creating educational games, animations, videos and other learning tools in food safety areas, including cooking games for kids; viral animations around hand washing; outreach animations for growers and producers; and virtual labs around key scientific concepts. The team has collaborated with partners at more than 40 universities in developing these research-based outreach tools, and produces research-based work on a variety of topics including math, science, health, financial literacy, and agriculture. Current projects include working on apps for pre-school learners and their parents on key movement and tasting behaviors; math games for elementary learners; a government game for middle school students based on food safety concepts; virtual labs on water safety for high school students; and virtual water testing labs and animations for growers, as well as additional animations and videos for various audiences.

A former stand-up comic, Dr. Chamberlin is a science enthusiast, technology evangelist, and passionate about Chile. She received a Ph.D. in Instructional Design from the University of Virginia, and has worked in Extension as an Educational Technology Specialist for nearly 20 years.

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IVAN PARKIN LECTURE ABSTRACT

The Power of Play: Using Media to Educate Our Stakeholders

Barbara Chamberlin, Ph.D.

New Mexico State University
Las Cruces, New Mexico, USA

Through our research, discoveries and sharing of knowledge, our ultimate goal is usually to change the behavior of consumers, growers, and other educators. The Learning Games Lab at New Mexico State University works with content experts at universities and organizations throughout the nation to develop educational games, animations, videos and interactive labs. Their tools, almost all of which are available free of charge, are developed through a specific development process which is designed to change our clientele.

Dr. Chamberlin will share highlights of the different projects they've created, including:

Ninja Kitchen (game), ninjakitchengame.org

Speed is important, but in this kitchen, safety comes first. Stop for lunch at a cafe staffed entirely by ninjas. Sophisticated gameplay reveals principles of food safety in this diner game created for kids.

Potluck Panic (game), potluckpanic.nmsu.edu

Correct unsafe food preparations before the food is consumed by your friends! Potluck Panic is an interactive game for college students that educates players on safe food-handling procedures, from the factory to the kitchen.

Virtual Labs, myfoodsciencelab.org

A collection of eight interactive web modules (Adobe Flash), and eight iPad apps. Students perform common food science lab procedures step by step in a virtual laboratory.

Don't Wash Your Chicken!, dontwashyourchicken.org

Videos, animation, recipes, and printable fotonovelas reinforce the importance of not washing raw poultry.

Don't Be Gross, dontbegross.org

These short, shareable animations convey the importance of hand washing and other health issues.

Produce Safety Matters, producesafetymatters.org

Designed for extension training and outreach, growers, packers, and retailers learn tips to prevent contamination from farmer's field to consumer's fork in these crisp animations.

The *Transformational Design Model* is an educational design model based on five key ways to change people: their knowledge (what they know), skill (what they can do), behavior (how they act), emotion, (how they feel) and physiology (how they are). When educational designers start the specific ways in which they want a learner to change, the next step is to design the activities that will lead to that change.

Activity design is more complex, as there are hundreds of ways to learn, experience, develop and grow; such as, receiving information, failing, observing, planning, communicating, thinking, and solving problems. This range of activities includes moving a learner from activities that provide simple exposition, through different types of activities to more inquiry-based learning. This range of activities is helpful in guiding designers through a learning experience. The range provided doesn't offer a continuum of good through bad; rather, it is designed to help developers think through the needs of the player. Sometimes simple exposure to knowledge is useful, when other kinds of learning and change demands reflection, creative activity and building, or learner-centered project development.

Additional resources developed by the Learning Games Lab are available at learninggameslab.org.

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MONDAY, JULY 22

MONDAY

ALL DAY

8:30 a.m. – 6:15 p.m.
Exhibit Hall

Poster Session 1

Communication Outreach and Education	Epidemiology	Food Defense
Food Law and Regulation	Food Processing Technologies	Food Safety Systems
General Microbiology	Low-water Activity Foods	Modeling and Risk Assessment
Molecular Analytics, Genomics and Microbiome	Retail and Food Service Safety	

P1-01 through P1-123 – Authors present 10:00 a.m. – 11:30 a.m. and 5:15 p.m. – 6:15 p.m.
P1-124 through P1-281 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m.

MORNING

8:30 a.m. – 12:15 p.m.

Room M100	S1	Tracking FSMA Quantitative and Qualitative Impacts on the Food Industry under Full FDA Enforcement – Stats, Trends, Challenges and Lessons Learned
Room M104	T1	Technical Session 1 – Pre-harvest Food Safety and Produce
Room M112	T2	Technical Session 2 – Antimicrobials

8:30 a.m. – 10:00 a.m.

Ballroom A	S2	Seek and You Shall Find: The Intricacies of a Robust *Listeria* Environmental Monitoring Plan
Ballroom C	S3	Tracing Produce: Where We are and What's Next?
Ballroom D	S4	Water Management in Food Manufacturing: Be Prepared for Problems
Ballroom E	S5	Does Zero Risk Really Exist: How to Communicate Variability and Uncertainty to Government and Industry Managers
Room M105	S6	Impact of Robotics and Artificial Intelligence on Food Safety
Room M107	S7	New Methods in Analytical and Bioanalytical Sensing for Food Safety and Quality
Room M108	S8	Ensuring Safety by Design: Connecting the Dots of Food Protection throughout the Farm-to-Fork Continuum – A Poultry Case Study
Room M109	S9	Making Sense of Food Allergen Analysis

10:00 a.m. – 10:45 a.m. **Break – Refreshments Available in the Exhibit Hall**

10:45 a.m. – 12:15 p.m.

Ballroom A	S10	*Listeria monocytogenes* and the Produce Industry: Best Practices for Sanitary Design, Control and Monitoring
Ballroom C	S11	Why are We Still Having Food Safety Failures If We All Have Food Safety Systems?
Ballroom D	S12	Water Re-use in the Food Processing Industry: Risk-based Approaches in Practice
Ballroom E	RT1	Is It Time for Food Safety Performance Standards Since Zero Risk is Not an Option?
Room M105	S13	Artificial Intelligence and Machine Learning: What They are and Their Potential Applications for Food Safety
Room M107	S14	Food Microbiome Transfer Dynamics from Farm to Processing – What Can Metagenomics Add to the Picture?
Room M108	S15	Science and Regulatory Guidance Update: Lethality and Stabilization of Meat and Poultry Products
Room M109	S16	May Contain Allergens – A Risk-based Approach for Determining the Use of Precautionary Allergen Labelling (PAL)

12:00 p.m. – 1:30 p.m. **Lunch Available in the Exhibit Hall**

AFTERNOON

12:30 p.m. – 1:30 p.m.
Ballroom C — **U.S. REGULATORY UPDATE ON FOOD SAFETY**

1:30 p.m. – 5:15 p.m.

Ballroom D	S17	Managing Large Multidisciplinary/Multi-Institutional Food Safety Projects – Effectively, Impactfully, and with Integrity
Room M104	T3	Technical Session 3 – Produce
Room M107	T4	Technical Session 4 – Antimicrobials

1:30 p.m. – 3:00 p.m.

Room M100	RT2	Today's RTE Redefined – Managing Environmental Controls and the Risk of the "Reasonably Foreseeable"
Room M101	RT3	Emerging Foods: Seaweed; Superfood, Health and Safety, Challenges and Opportunities
Ballroom A	S18	Is Cell Cultured Meat Really Meat?
Ballroom E	S19	Beyond Slide Decks and Classrooms: Novel Approaches to Food Safety Learning
Room M105	S20	International Food Defense Preparation for FSMA and Beyond
Room M108	S21	Applying Lessons Learned: Keeping STEC Off Our Lettuce
Room M109	S22	Breaking the Mold: Using Foods to Protect Against Food Allergy
Room M112	S23	Microbiological Method Verification in Food Manufacturing: Are Your Methods "Fit Enough" for Purpose?

3:00 p.m. – 3:45 p.m. **Break – Refreshments Available in the Exhibit Hall**

3:45 p.m. – 5:15 p.m.

Ballroom A	S24	2018 State and Local Foodborne Illness Investigations
Ballroom C	RT4	*Cyclospora*: It's Not Just an Imports' Issue
Ballroom E	S25	You Cannot Audit Food Safety Culture – Wrong, Here's How!
Room M100	RT5	#FoodSafety: Practical Advice for Digital Communication and Science Storytelling
Room M105	S26	A South/Latin American Perspective on Microbiological Safety and Regulatory Guidelines for Fruit Juices: Issues and Opportunities
Room M108	S27	Utilization of Metagenomics Technologies to Enhance Produce Safety and Quality
Room M109	S28	Looking to the Future: What Do Decision Makers Want to Know or Need to Know about Managing Chemical Contaminants in Food?
Room M112	S29	Statistical Methods for Microbial Data and Process Validation: The *P*-value is What?

EVENING OPTIONS

5:15 p.m. – 6:15 p.m.	**Exhibit Hall Reception**
5:30 p.m. – 7:00 p.m.	Update on the Produce Safety Alliance – Outreach and Education, *Room M109*

AFFILIATE MEETINGS

5:30 p.m. – 6:30 p.m.	China Association for Food Protection and Chinese Association for Food Protection in North America Meeting, *Room M104*
5:30 p.m. – 6:30 p.m.	African Continental Association for Food Protection Meeting, *Room M105*
6:00 p.m. – 7:00 p.m.	Indian Association for Food Protection in North America, *Room M107*

IAFP PROGRAM

MONDAY MORNING
JULY 22
Posters will be on display 8:30 a.m. – 6:15 p.m.
(See details beginning on page 61)

S1 **Tracking FSMA Quantitative and Qualitative Impacts on the Food Industry Under Full FDA Enforcement – Stats, Trends, Challenges and Lessons Learned**
Room M100
Organizers and Convenors: Allen Sayler, Purnendu Vasavada
Sponsored by EAS Consulting Group, LLC

Developing Food Safety Professionals
FSMA
Food Safety Assessment, Audit and Inspection

8:30 FDA's Perspective and Experience on FSMA Enforcement and Inspections
GLENN BASS, U.S. Food & Drug Administration, White Oak, MD, USA

9:00 FDA FSMA's Enforcement Impact on U.S. Food Manufacturers: Experiences, Case Studies and Lessons Learned
KARLEIGH BACON, The Kraft Heinz Company, Chicago, IL, USA

9:30 FSMA Enforcement Impact on Foreign Food Manufacturer – International Experiences, Examples and Feedback
GREGORY PRITCHARD, Nestlé USA, Glendale, CA, USA

10:00 Break – Refreshments Available in the Exhibit Hall

10:45 FDA's FSMA Enforcement Impact on Non-U.S. Food Manufacturers – Examples: Food Retailer: Examples, Case Studies and Recommendations
ALLEN SAYLER, EAS Consulting Group, Alexandria, VA, USA

11:15 FSPCA Education and Outreach for Facilitating FSMA Implementation in the U.S. and Internationally
PURNENDU VASAVADA, University of Wisconsin-River Falls, River Falls, WI, USA

11:45 Legal and Food Industry Liability Challenges Created by FSMA
ELIZABETH FAWELL, Hogan Lovells, Washington, D.C., USA

12:15 Lunch Available in the Exhibit Hall

S2 **Seek and You Shall Find: The Intricacies of a Robust *Listeria* Environmental Monitoring Plan**
Ballroom A
Organizers and Convenors: Joelle K. Salazar, Diana Stewart

Dairy Quality and Safety
Meat and Poultry Safety and Quality
Sanitary Equipment and Facility Design

8:30 The Role of Environmental Monitoring in a Preventive Controls System
JENNY SCOTT, U.S. Food and Drug Administration – CFSAN, College Park, MD, USA

9:00 The Food Safety and Inspection Service: Experiences with *Listeria* to Inform Risk Assessments and Other Guidance Documents
LINDSAY WARD-GOKHALE, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

9:30 Seeking, Finding, and Eliminating: Challenges of a *Listeria* Environmental Monitoring Program in a Global Manufacturing Context
JOHN DONAGHY, Nestec Ltd., Vevey, Switzerland

10:00 Break – Refreshments Available in the Exhibit Hall

S3 **Tracing Produce: Where We are and What's Next?**
Ballroom C
Organizers: Kari Irvin, Sherri McGarry
Convenor: Sherri McGarry

Epidemiology
Fruit and Vegetable Safety and Quality

8:30 Overview of the Produce Traceability Initiative
ED TREACY, PMA, Newark, DE, USA

9:00 It's Not Just about FSMA; Regulatory Options and Interconnectivity
KATHERINE VIERK, U.S. Food and Drug Administration, College Park, MD, USA

9:30 Enabling Technology to Improve Produce Traceability: The Walmart Experiment
TEJAS BHATT, Walmart, Bentonville, AR, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S4 **Water Management in Food Manufacturing: Be Prepared for Problems**
Ballroom D
Organizer: Anett Winkler
Convenor: Roy Betts

Food Safety Assessment, Audit and Inspection
HACCP Utilization and Food Safety Systems
Water Safety and Quality

8:30 Spread of Pathogens by Water: What Went Wrong and What Could Go Wrong?
MIEKE UYTTENDAELE, Ghent University, Ghent, Belgium

9:00 Water Treatment Technologies for "Fit for Purpose" Water
PHYLLIS POSY, Strategic Services & Regulatory Affairs Atlantium Technologies, Har Tuv Industrial Park, Israel

9:30 Water Management within the Manufacturing Premises (water lines, treatment, testing)
ANETT WINKLER, Cargill, Inc., Munich, Germany

10:00 Break – Refreshments Available in the Exhibit Hall

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

S5 **Does Zero Risk Really Exist: How to Communicate Variability and Uncertainty to Government and Industry Managers**
Ballroom E
Organizers: Mariem Ellouze, Fernando Perez Rodriguez,
Convenor: Mariem Ellouze
Sponsored by International Committee on Predictive Modelling in Food (ICPMF) and International Committee on Food Microbiology and Hygiene (ICFMH) and the IAFP Foundation

Communication, Outreach and Education
International Food Protection Issues
Microbial Modelling and Risk Analysis

8:30 Variability and Uncertainty in a World of Zero Tolerance
LAURENT GUILLIER, ANSES, University of Paris-Est, Maisons-Alfort, France

9:00 The Devil is in the Tail: Communicating Variability and Uncertainty to Industry Managers
LEON GORRIS, Food Safety Expert, Nijmegen, The Netherlands

9:30 Variability and Uncertainty: Some Reflections from EU Risk Management Perspective
KRIS DE SMET, European Commission, Ghent, Belgium

10:00 Break – Refreshments Available in the Exhibit Hall

S6 **Impact of Robotics and Artificial Intelligence on Food Safety**
Room M105
Organizers and Convenors: Peter Ben Embarek, Ian Jenson

Artificial Intelligence
Food Defense
International Food Protection Issues

8:30 Use of Artificial Intelligence in Managing Food Safety Aspects of Online Merchants Platforms
TBD

9:00 Impact of Robotics on Food Manufacturing Operations
MIKE HARPER, Soft Robotics, Bedford, MA, USA

9:30 Potential for Robotic Processing of Red Meat: Food Safety Implications
IAN JENSON, Meat & Livestock Australia, North Sydney, Australia

10:00 Break – Refreshments Available in the Exhibit Hall

S7 **New Methods in Analytical and Bioanalytical Sensing for Food Safety and Quality**
Room M107
Organizers: Antje Baeumner, Sam Nugen
Convenor: Sam Nugen
Sponsored by International Association of Environmental Analytical Chemistry (IAEAC)

Advanced Molecular Analytics
Applied Laboratory Methods
Water Safety and Quality

8:30 Surface Enhanced Raman Microscopy for Studying the Behaviors of Pesticides and Nanoparticles on/in Plants *in Situ*
LILI HE, University of Massachusetts, Amherst, MA, USA

9:00 Advances in Bacteriophage Engineering for Rapid Pathogen Detection
EMMA FARQUHARSON, Cornell University, Ithaca, NY, USA

9:30 Engineered Reporter Enzymes for Ultrasensitive Biosensing
JOEY TALBERT, Iowa State University, Ames, IA, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S8 **Ensuring Safety by Design: Connecting the Dots of Food Protection throughout the Farm-to-Fork Continuum – A Poultry Case Study**
Room M108
Organizers: Patrice Arbault, William Chaney, Stephanie Pollard
Convenors: Patrice Arbault, Jose Emilio Esteban, J. David Legan

Advanced Molecular Analytics
Applied Laboratory Methods
Meat and Poultry Safety and Quality

8:30 Pathogen Reduction Strategies in the Pre-harvest Environment
WILLIAM CHANEY, Diamond V, Cedar Rapids, IA, USA

9:00 Food Safety by Design in Poultry Processing
JERRI LYNN PICKETT, WBA Analytical Laboratories, Springdale, AR, USA

9:30 Challenges and Considerations for Rapid Pathogen Detection in Complex Matrices
STEPHANIE POLLARD, Clear Labs Inc., Menlo Park, CA, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S9 **Making Sense of Food Allergen Analysis**
Room M109
Organizers: Melanie Downs, Tong-Jen Fu, Marianne Solomotis
Convenors: Melanie Downs, Tong-Jen Fu

Applied Laboratory Methods
Food Chemical Hazards and Food Allergy
Food Safety Assessment, Audit and Inspection

8:30 Selecting an Appropriate Food Allergen Detection Method
RAKHI PANDA, U.S. Food and Drug Administration, College Park, MD, USA

9:00 Food Allergen Method Performance in the Food Industry
JUPITER YEUNG, Nestlé, Fremont, MI, USA

9:30 What to Do with a Positive Food Allergen Test Result
JOSEPH BAUMERT, University of Nebraska-Lincoln, Lincoln, NE, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S10 ***Listeria monocytogenes* and the Produce Industry: Best Practices for Sanitary Design, Control and Monitoring**
Ballroom A
Organizer: Robert Donofrio
Convenors: Robert Donofrio, Jennifer McEntire, Robert Whitaker

Food Hygiene and Sanitation
Fruit and Vegetable Safety and Quality
Sanitary Equipmet and Facility Design

10:45 Produce Associations Collaboration Efforts for Industry Education
JENNIFER MCENTIRE, United Fresh, Washington, D.C., USA

11:15 Sanitization Efficacy and Impact of Sanitary Design for Control of *L. monocytogenes* in the Processing Plant
TREVOR SUSLOW, University of California-Davis, Davis, CA, USA

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

11:45 Validation and Verification Approaches for *Listeria* Detection Methods
ROBERT DONOFRIO, Neogen Corporation, Lansing, MI, USA

12:15 Lunch Available in the Exhibit Hall

S11 Why are We Still Having Food Safety Failures If We All Have Food Safety Systems?
Ballroom C
Organizers: Sally Crowley, Loralyn Ledenbach, Mark Moorman
Convenors: Sally Crowley, Mark Moorman

Food Safety Assessment, Audit and Inspection
Foodborne Illness
HACCP Utilization and Food Safety Systems

10:45 Food Recalls and Outbreaks – What are the Root Causes of Unsafe Foods in the Marketplace?
GALE PRINCE, Sage Food Consulting, Cincinnati, OH, USA

11:15 Food Safety Systems - What Does History Tell Us are the Weakest Links?
SALLY CROWLEY, Cargill, Inc., Hopkins, MN, USA

11:45 Foods without Definitive Preventive Controls – What's Next?
NATHAN ANDERSON, U.S. Food and Drug Administration, Bedford Park, IL, USA

12:15 Lunch Available in the Exhibit Hall

S12 Water Re-use in the Food Processing Industry: Risk-based Approaches in Practice
Ballroom D
Organizers: Leon Gorris, Elisabetta Lambertini
Convenors: Elisabetta Lambertini, Kang Zhou
Sponsored by the IAFP Foundation

Dairy Quality and Safety
Fruit and Vegetable Safety and Quality
International Food Protection Issues

10:45 The JEMRA Risk-based Framework for Water Re-use Under Development
LEON GORRIS, Food Safety Expert, Nijmegen, The Netherlands and KANG ZHOU, FAO, Rome, Italy

11:15 Experience with Water Re-use in Dairy Operations
PHYLLIS POSY, Strategic Services & Regulatory Affairs Atlantium Technologies, Har Tuv Industrial Park, Israel

11:45 Water Reuse in the Fresh Produce Production Chain: What are the Alternatives for the Industry?
ANA ALLENDE, CEBAS-CSIC, Murcia, Spain

12:15 Lunch Available in the Exhibit Hall

S13 Artificial Intelligence and Machine Learning: What They are and Their Potential Applications for Food Safety
Room M105
Organizers: Matthew Moore, Amit Morey, Sarah Murphy
Convenors: Matthew Moore, Sarah Murphy
Sponsored by the IAFP Foundation

Advanced Molecular Analytics
Developing Food Safety Professionals
International Food Protection Issues

10:45 Making Sense of Big Data; Using AI and Machine Learning to Advance Our Knowledge of the Biology of Foodborne Pathogens
HENK DEN BAKKER, Center for Food Safety, University of Georgia, Griffin, GA, USA

11:15 Implementing Automation and Blockchain: An Industry Perspective
WENDY WHITE, Georgia Tech, Greensboro, GA, USA

11:45 Opportunities for Data Science in Preventing and Mitigating Foodborne Disease Outbreaks
ABIGAIL HORN, Center for Applied Network Analysis, University of Southern California, Los Angeles, CA, USA

12:15 Lunch Available in the Exhibit Hall

S14 Food Microbiome Transfer Dynamics from Farm to Processing – What Can Metagenomics Add to the Picture?
Room M107
Organizers: Karen Jarvis, Pushpinder Kaur Litt, Sarita Raengpradub
Convenors: Vikrant Dutta, Karen Jarvis, Sarita Raengpradub

Advanced Molecular Analytics
Fruit and Vegetable Safety and Quality
Meat and Poultry Safety and Quality

10:45 Microbiome Shifts on the Farm to Identify Routes of Transmission
CHRISTOPHER GRIM, U.S. Food and Drug Administration, CFSAN, Laurel, MD, USA

11:15 Poultry Microbiome Profiles from Farm to Fork
STEVEN RICKE, University of Arkansas, Fayetteville, AR, USA

11:45 Meat Microbiome and Antimicrobial Resistance
KEITH BELK, Colorado State University, Fort Collins, CO, USA

12:15 Lunch Available in the Exhibit Hall

S15 Science and Regulatory Guidance Update: Lethality and Stabilization of Meat and Poultry Products
Room M108
Organizers and Convenors: Susan Hammons, KatieRose McCullough, Meryl Silverman
Sponsored by Foundation for Meat and Poultry Research and Education

HACCP Utilization and Food Safety Systems
Meat and Poultry Safety and Quality
Microbial Modelling and Risk Analysis

10:45 FSIS' Guidance Update and Ongoing Lethality and Stabilization Efforts
SUSAN HAMMONS, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

11:15 Effects of Product Moisture and Process Humidity on Pathogen Lethality during Continuous Cooking of Meat and Poultry Products
BRADLEY MARKS, Michigan State University, East Lansing, MI, USA

11:45 Validating Growth Models for *Clostridium perfringens*, *Clostridium botulinum*, and *Bacillus cereus* during Cooling of Uncured Meat and Poultry Products
KATHLEEN GLASS, University of Wisconsin-Madison, Madison, WI, USA

12:15 Lunch Available in the Exhibit Hall

S16 **May Contain Allergens – A Risk-based Approach for Determining the Use of Precautionary Allergen Labelling (PAL)**
Room M109
Organizer and Convenor: Sally Klinect

Food Chemical Hazards and Food Allergy

10:45 Use of VITAL Reference Doses to Determine PAL
JOSEPH BAUMERT, University of Nebraska-Lincoln, Lincoln, NE, USA

11:15 Supply Chain Approach to PAL
BRENT KOBIELUSH, Cargill, Inc., Wayzata, MN, USA

11:45 CPG Approach to PAL
DAVID CLIFFORD, Nestlé USA, Inc., Dublin, OH, USA

12:15 Lunch Available in the Exhibit Hall

RT1 **Is It Time for Food Safety Performance Standards Since Zero Risk is Not an Option?**
Ballroom E
Organizer and Convenor: Alison Kretser
Sponsored by ILSI North America Food Microbiology Committee

Fruit and Vegetable Safety and Quality
Meat and Poultry Safety and Quality
Performance Standards for Non-Microbiological Hazards

10:45 Panelists:

CANDACE DOEPKER, ToxStrategies, Newport, KY, USA

DONNA GARREN, American Frozen Food Institute, McLean, VA, USA

CRAIG HEDBERG, University of Minnesota, School of Public Health, Minneapolis, MN, USA

SCOTT HOOD, General Mills, Golden Valley, MN, USA

ANGELA SIEMENS, Cargill, Inc., Towanda, KS, USA

12:15 Lunch Available in the Exhibit Hall

T1 **Technical Session 1 – Pre-harvest Food Safety and Produce**
Room M104
Convenors: Achyut Adhikari, Jiin Jung

T1-01 8:30 Lactic Acid Culture to Suppress *Listeria* Growth and the Decay of Minimally Processed Vegetables
Besnik Hidri, Michael Sciberras, Gustavo Ramirez, VERONIQUE ZULIANI, Chr. Hansen, Arpajon, France

T1-02 8:45 Prevalence of *Salmonella enterica* and *Listeria monocytogenes* in Irrigation Waters as determined by Culture-based and Rapid Molecular Methods
ERIC HANDY, Cheryl East, Rhodel Bradshaw, Mary Theresa Callahan, Sarah Allard, Shirley A. Micallef, Shani Craighead, Brienna Anderson-Coughlin, Samantha Gartley, Kali Kniel, Joseph Haymaker, Chanelle White, Fawzy Hashem, Salina Parveen, Eric May, Hillary Craddock, Rianna Murray, U.S. Department of Agriculture – ARS, Environmental Microbial and Food Safety Laboratory, Beltsville, MD, USA

T1-03 9:00 Ballpark Figures: Use of a Mathematical Model to Estimate Relative Risk from Agricultural Water to Produce in Pursuit of "Same Level of Public Health Protection" Evaluations
DON STOECKEL, Cornell University, Geneva, NY, USA

T1-04 9:15 Evaluation of Zero Valent Iron Filtration to Reduce *Escherichia coli* in Agricultural Irrigation Water in Laboratory and Field Trials
SEONGYUN KIM, Rhodel Bradshaw, Prachi Kulkarni, Pei Chiu, Sarah Allard, Amy Sapkota, Eric Handy, Cheryl East, Kali Kniel, Manan Sharma, Maryland Institute for Applied Environmental Health, University of Maryland, School of Public Health, College Park, MD, USA

T1-05 9:30 Environmental Inactivation and Irrigation-mediated Regrowth of *Escherichia coli* O157:H7 on Romaine Lettuce When Inoculated in a Fecal Slurry Matrix
JENNIFER A. CHASE, Melissa L Partyka, Ronald F. Bond, Edward R. Atwill, University of California-Davis, Davis, CA, USA

T1-06 9:45 Pathogen Persistence and Transfer Dynamics as Influenced by Biological Soil Amendments in a Preharvest Environment
PUSHPINDER KAUR LITT, Alyssa Kelly, Quinn Riley, Alexis Omar, Gordon Johnson, Manan Sharma, Kali Kniel, University of Delaware, Newark, DE, USA

10:00 Break – Refreshments Available in the Exhibit Hall

T1-07 10:45 Establishment of Vegetation Buffer Zone Areas to Reduce Transfer of Enteric Pathogens from Animal Operations to Fresh Produce
MORGAN YOUNG, Ayanna Glaize, Christopher Gunter, Siddhartha Thakur, Eduardo Gutierrez, North Carolina State University, Raleigh, NC, USA

T1-08 11:00 The Use of Riparian Buffer Zones to Reduce the Risk of *Salmonella* Transmission from Animal Operations to Fresh Produce
AYANNA GLAIZE, Morgan Young, Christopher Gunter, Eduardo Gutierrez-Rodriguez, Siddhartha Thakur, North Carolina State University, Raleigh, NC, USA

T1-09 11:15 Investigating the Influence of Streptomycin Sprays on Bacterial Populations in the Apple Carposphere and Orchard Soil
MARY THERESA CALLAHAN, Christopher S. Walsh, Shirley A. Micallef, University of Maryland, College Park, MD, USA

T1-10 11:30 *Salmonella* and Indicator Bacteria Profiles of Produce and Meat Products Sold in Northern California Farmers' Markets: Implications for Microbial Food Safety
James Stover, Michele Jay-Russell, Viktoria Hagahani, Peiman Aminabadi, Thais Ramos, ALDA PIRES, University of California, Davis, CA, USA

T1-11 11:45 The Whole is Greater Than the Sum of Its Parts: Building Cooperative Monitoring Programs among Farms
RONALD F. BOND, Melissa L Partyka, Jennifer A. Chase, Ines Hanrahan, Justin Harter, Edward R. Atwill, University of California-Davis, Davis, CA, USA

T1-12 12:00 Development of the On-Farm Readiness Review to Prepare Farms for Produce Safety Rule Implementation
Elizabeth Bihn, Travis Chapin, Michelle Danyluk, Christopher Gunter, Wesley Kline, MEREDITH MELENDEZ, Phillip Tocco, Rutgers NJAES Cooperative Extension, Trenton, NJ, USA

12:15 Lunch Available in the Exhibit Hall

T2 **Technical Session 2 – Antimicrobials**
Room M112
Convenors: Govindaraj Dev Kumar, Andrea Moreno Switt

T2-01 8:30 Phage-like Plasmids Transfer Antibiotic and Heavy Metal Resistance Genes by Transduction, Transformation and Conjugation
Anna Colavecchio, Jeffrey Chandler, Bledar Bisha, Shannon Coleman, Jean-Guillaume Emond-Rheault, Jeremie Hamel, Irena Kukavica-Ibrulj, Roger Levesque, Séamus Fanning, LAWRENCE GOODRIDGE, University of Guelph, Guelph, ON, Canada

T2-02 8:45 Bio-based Sanitizer Delivery Systems for Improved Sanitation of Bacterial and Fungal Biofilms
NITIN NITIN, Kang Huang, University of California-Davis, Davis, CA, USA

T2-03 9:00 A Novel Antimicrobial Film for Preventing Cross-Contamination of Fresh Produce
JIYOON YI, Kang Huang, Yue Ma, Gang Sun, Nitin Nitin, University of California-Davis, Davis, CA, USA

T2-04 9:15 Developing High Performance, Low Cost and Rechargeable Antimicrobial Coatings for Food Safety Applications
MINGYU QIAO, Randy Worobo, Minglin Ma, Cornell University, Ithaca, NY, USA

T2-05 9:30 Antioxidant-Antibacterial Properties and Nutrition Value of Some Varieties of Libyan Date Palm Fruits (*Phoenix dactylifera*)
Anwar Swedan, Abdurazzqe Auzi, RABYA LAHMER, University of Tripoli, Tripoli, Libya

T2-06 9:45 Activity of Lavender (*Lavandula officinalis*) Essential Oil Against *Listeria monocytogenes* and Sensory Acceptance of the Effective Concentrations in Fresh-cut Mango
Winnie A. Luciano, Danieli C. Schabo, Vasilis P. Valdramidis, MARCIANE MAGNANI, Federal University of Paraiba, João Pessoa, Brazil

10:00 Break – Refreshments Available in the Exhibit Hall

T2-07 10:45 Application of Bacteriophages on Beef and Leafy Greens as a Natural Intervention against *E. coli* O157
Joël van Mierlo, Sander Witte, Linda Huijboom, Leoni van de Straat, Steven Hagens, BERT DE VEGT, Micreos Food Safety B.V., Wageningen, The Netherlands

T2-08 11:00 Nutrient Stress as a Means to Enhance Robustness in *Lactobacillus plantarum* B21 for Improved Food Protection
ELVINA PARLINDUNGAN, Oliver Jones, Bee May, RMIT University, Melbourne, Australia

T2-09 11:15 Impact of Static and Turned Pile Composting of Dairy Manure on the Persistence of Pathogenic *E. coli* and Transfer to Spinach Leaves
Morgan Young, Idalys Hernandez, Sarah Montoya, Gabriela Arteaga-Arredondo, EDUARDO GUTIERREZ, North Carolina State University, Raleigh, NC, USA

T2-10 11:30 Effects of *Origanun vulgare* on Physiological Functions of *Salmonella* Enteritidis Sessile Cells in Mature Biofilms
Myrella Cariri Lira, Adma Nadja Ferreira de Melo, Erika Tayse da Cruz Almeida, Evandro L. de Souza, Donald W. Schaffner, MARCIANE MAGNANI, Federal University |of Paraiba, João Pessoa, Brazil

T2-11 11:45 Disrupting Irreversible Bacterial Adhesion and Biofilm Formation with an Engineered Enzyme
HOLLY MAYTON, Sharon Walker, Bryan Berger, University of Virginia, Charlottesville, VA, USA

T2-12 12:00 Surfactant Type Plays an Important Role in Antimicrobial Efficiency
GOVINDARAJ DEV KUMAR, Abhinav Mishra, Kevin Mis Solval, Dumitru Macarisin, University of Georgia Center for Food Safety, Griffin, GA, USA

12:15 Lunch Available in the Exhibit Hall

Check the Program Addendum for changes to the Program.

– Symposia – Roundtables – Technicals – Developing Scientist Competitor – Topic Areas

Louisville KENTUCKY
IAFP 2019
ANNUAL MEETING · JULY 21–24

U.S. REGULATORY UPDATE ON FOOD SAFETY

Frank Yiannas, MPH
Deputy Commissioner
for Food Policy and Response
U.S. Food & Drug
Administration (FDA)

Frank Yiannas, MPH, is the Deputy Commissioner for Food Policy and Response, a position he assumed in December 2018. Mr. Yiannas is the principal advisor to the U.S. FDA Commissioner in the development and execution of policies related to food safety, including implementation of the landmark FDA Food Safety Modernization Act (FSMA), helping reduce food safety risks and achieve high rates of compliance with FDA food safety standards. He previously served in leadership roles with Walmart and the Walt Disney Company.

Mindy Brashears, Ph.D.
Deputy Under Secretary for
Food Safety
U.S. Department of Agriculture
(USDA)

Mindy Brashears, Ph.D., serves as Deputy Under Secretary for the USDA's Office for Food Safety. In this position since January 2019, Dr. Brashears oversees development, implementation, and enforcement of all of the Food Safety and Inspection Service's (FSIS') regulations, policies, and programs. Prior to this position, Dr. Brashears was Professor of Food Safety and Public Health and the Director of the International Center for Food Industry Excellence at Texas Tech University.

MONDAY, JULY 22
12:30 p.m. – 1:30 p.m.

MONDAY AFTERNOON
JULY 22

Posters will be on display 8:30 a.m. – 6:15 p.m.
(See details beginning on page 61)

12:30 p.m. – 1:30 p.m.

U.S. REGULATORY UPDATE ON FOOD SAFETY
FRANK YIANNAS *Deputy Commissioner for Food Policy and Response,* U.S. Food & Drug Administration (FDA) Silver Springs, MD, USA
MINDY BRASHEARS, *Deputy Under Secretary for Food Safety*, U.S. Department of Agriculture (USDA) Washington, D.C., USA
Ballroom C

S17 **Managing Large Multidisciplinary/Multi-Institutional Food Safety Projects – Effectively, Impactfully, and with Integrity**
Ballroom D
Organizer: Alison Kretser
Convenors: Bradley Marks, Kendra Nightingale, Isabel Walls
Sponsored by ILSI North America Food Microbiology Committee

Developing Food Safety Professionals
Management of Multi-Center Research Projects and Scientific Integrity

1:30 Scholarly Assessment of Large Scholarly Collaboration: Measures of Effectiveness and Impact
DENIS GRAY, North Carolina State University, Raleigh, NC, USA

2:00 Managing Government-Academic-Industry Collaborations
KIMBERLY COOK, U.S. Department of Agriculture – ARS, Beltsville, MD, USA

2:30 Lessons Learned from Managing Norocore, a Large USDA-CAP Project
LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA

3:00 Break – Refreshments Available in the Exhibit Hall

3:45 Managing Food Safety Projects across Multiple Boundaries – Internally and Externally
EDITH WILKIN, Leprino Foods, Denver, CO, USA

4:15 Report from the Scientific Integrity Consortium: Principles and Best Practices for Scientific Integrity
LINDA J. HARRIS, University of California-Davis, Davis, CA, USA

4:45 Panel Discussion

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S18 **Is Cell Cultured Meat *Really* Meat?**
Ballroom A
Organizers and Convenors: Gloria Swick-Brown, Christina Wilson
Sponsored by the IAFP Foundation

Food Law
GMOs and Bioengineering
Meat and Poultry Safety and Quality

1:30 What is It? Where is It From?
PAUL MOZDZIAK, North Carolina State University, Raleigh, NC, USA

2:00 Is There a Strategy for Regulating These Novel Food Products? What Role Will USDA-FSIS Play?
ROBERTA WAGNER, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

2:30 Is There a Strategy for Regulating These Novel Food Products? What Role Will FDA Play?
JEREMIAH FASANO, U.S. Food and Drug Administration – CFSAN, College Park, MD, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S19 **Beyond Slide Decks and Classrooms: Novel Approaches to Food Safety Learning**
Ballroom E
Organizers: Brita Ball, Bertrand Emond
Convenors: Brita Ball, Bertrand Emond, Nicola Sharman

Communication, Outreach and Education
Food Safety Culture
Food Safety Education

1:30 Everything Old is New Again: Designing Board Games for Food Safety Training and Reinforcement
ANDY YEOMAN, Focus Games, Glasgow, United Kingdom

2:00 Size Matters: Why Learning Less Means Learning More with Micro-Learning and Gamification
CAROL LEAMAN, Axonify Inc., Waterloo, ON, Canada

2:30 Increasing Management Commitment: How a 360-rich Environment and Discovery Approaches Change Senior Leader Behavior before Training Ends
MEGAN KENJORA, The Hershey Company, Hershey, PA, USA and AUSTIN WELCH, Sage Media, Thornton, CO, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S20 **International Food Defense Preparation for FSMA and Beyond**
Room M105
Organizer and Convenor: Neal Fredrickson

Food Defense
International Food Protection Issues

1:30 The Food Defense International Collaborative Exchange
AMY KIRCHER, Food Protection and Defense Institute, University of Minnesota, St. Paul, MN, USA

2:00 FDA Food Defense Activities in the U.S. and Abroad
RYAN NEWKIRK, U.S. Food and Drug Administration, College Park, MD, USA

2:30 Preparing Domestic and Foreign Facilities for FSMA Compliance in Food Defense
KARLEIGH BACON, Kraft Heinz Company, Glenview, IL, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S21 **Applying Lessons Learned: Keeping STEC Off Our Lettuce**
Room M108
Organizers and Convenors: Kari Irvin, Sherri McGarry

Communication, Outreach and Education
Fruit and Vegetable Safety and Quality
Water Safety and Quality

1:30 Environmental Assessment: Lessons for Prevention
MICHELLE SMITH, U.S. Food and Drug Administration, College Park, MD, USA

2:00 The Outbreak, and CDC Role in Enhancing Water Sampling and Testing
MIA MATTIOLI, Centers for Disease Control and Prevention, Division of Foodborne, Waterborne and Environmental Diseases, Atlanta, GA, USA

2:30 Moving Forward: Changes in Practices or Standards?
TERESSA LOPEZ, Arizona LGMA (Leafy Greens Marketing Agreement), Phoenix, AZ, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S22 Breaking the Mold: Using Foods to Protect Against Food Allergy
Room M109
Organizer: Martin Chapman
Convenor: Paul Hanlon
Sponsored by the IAFP Foundation

Food Chemical Hazards and Food Allergy
International Food Protection Issues

1:30 Leaping Forward with Food Products to Prevent Food Allergies
WESLEY SUBLETT, University of Louisville School of Medicine, Louisville, KY, USA

2:00 Food Allergen Assays for the Future: It's All about Multiplexing
MARTIN CHAPMAN, Indoor Biotechnologies, Inc., Charlottesville, VA, USA

2:30 Clinical Guidelines in a New Era of Food Allergy Prevention
SCOTT COMMINS, University of North Carolina, Chapel Hill, NC, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S23 Microbiological Method Verification in Food Manufacturing: Are Your Methods "Fit Enough" for Purpose?
Room M112
Organizers: William Chaney, J. David Legan
Convenors: William Chaney, Larry Cohen, Stephanie Pollard

Applied Laboratory Methods

1:30 Performance Verification and Application of Rapid Pathogen Test Methods: A Food Company Perspective
BRADLEY ZIEBELL, Conagra Brands, Chicago, IL, USA

2:00 The Testing Lab Dilemma
J. DAVID LEGAN, Eurofins Microbiology Laboratories, Madison, WI, USA

2:30 Comparison of "Fitness for Purpose" in Established Validations Schemes: Is There a Best Approach?
MORGAN WALLACE, Rheonix, Ithaca, NY, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT2 Today's RTE Redefined – Managing Environmental Controls and the Risk of the "Reasonably Foreseeable"
Room M100
Organizer and Convenor: Lisa Lupo

Food Safety Assessment, Audit and Inspection
Fruit and Vegetable Safety and Quality
Low Water Activity Foods

1:30 Panelists:
DAVID ACHESON, The Acheson Group, Big Fork, MT, USA
ERIC BROWN, U.S. Food and Drug Administration, Center for Food Safety & Applied Nutrition, College Park, MD, USA
PEYMAN FATEMI, The Acheson Group, Pleasanton, CA, USA
SCOTT HOOD, General Mills, St. Paul, MN, USA
SEAN LEIGHTON, Cargill, Inc., Wayzata, MN, USA
MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT3 Emerging Foods: Seaweed; Superfood, Health & Safety, Challenges & Opportunities
Room M101
Organizers: Kevin Edwards, Evelyn (Gutierrez) Watts
Convenor: Kevin Edwards

HACCP Utilization and Food Safety Systems
Seafood Safety and Quality
Water Safety and Quality

1:30 Panelists:
ANDREA (TREY) ANGERA, Springtide Seaweed, LLC, Gouldsboro, ME, USA
PATRICIA BIANCHI, Aquaculture Stewardship Council, Utrecht, The Netherlands
WILLIAM BURKHARDT, U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, Mobile, AL, USA
ANOUSHKA CONCEPCION, Connecticut Sea Grant and Department of Extension, University of Connecticut, Groton, CT, USA
BALUNKESWAR (BALU) NAYAK, University of Maine, Orono, ME, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S24 2018 State and Local Foodborne Illness Investigations
Ballroom A
Organizer and Convenor: Steven Mandernach
Sponsored by Association of Food and Drug Officials

Epidemiology
Retail and Foodservice
Viral and Parasitic Foodborne Disease

3:45 10-year Outbreak of *Salmonella enterica* Serovar Mbandaka in Michigan
LISA HAINSTOCK, Michigan Department of Agriculture, Lansing, MI, USA

4:15 Tennessee Raw Milk *E. coli* Outbreak Resulting in Multiple Cases of Hemolytic Uremic Syndrome
D.J. IRVING, Tennessee Department of Health, Nashville, TN, USA

4:45 Florida *Vibrio paraphemolyticus* Outbreak Associated with Grocery Lump Crab
JAMIE DEMENT, Florida Department of Health, Tallahassee, FL, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

MONDAY PM

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

S25 **You Cannot Audit Food Safety Culture – Wrong, Here's How!**
Ballroom E
Organizers: Andrew Clarke, Lone Jespersen, Helen Taylor, Wendy White
Convenor: Wendy White

Food Safety Assessment, Audit and Inspection
Food Safety Culture

3:45 The Challenges of Incorporating Cultural Assessment into a Food Safety Audit
ANDREW CLARKE, Loblaw, Brampton, ON, Canada

4:15 A Practical Approach to Supporting Small Businesses to Create and Sustain Food Safety Culture
HELEN TAYLOR, ZERO2FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

4:45 The Challenge of Assessing and Strengthening Food Safety Culture
LONE JESPERSEN, Cultivate Food Safety, Hauterive, Switzerland

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S26 **A South/Latin American Perspective on Microbiological Safety and Regulatory Guidelines for Fruit Juices: Issues and Opportunities**
Room M105
Organizers and Convenors: Vijay Juneja, Félix Ramos Guerrero
Sponsored by the IAFP Foundation

Beverages and Acid/Acidified Foods
HACCP Utilization and Food Safety Systems
Retail and Foodservice

3:45 Trends in Milder Processing of Fruit Juices: Problems and Foodborne Illness Outbreaks
JOSHUA GURTLER, U.S. Department of Agriculture-ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

4:15 Microbiological Spoilage Issues in Fruit Juices: Prevalence, Problems and Challenges
FÉLIX RAMOS GUERRERO, ICCCIA-Ricardo Palma University, Lima, Peru

4:45 Hurdles, Challenges and Opportunities for Fruit Juices in International Trade: The Case of Camu-Camu and Other Fruits Considered as Novel Foods
MARÍA DÍAZ ZÚÑIGA, ICCCIA-Ricardo Palma University, Lima, Peru

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S27 **Utilization of Metagenomics Technologies to Enhance Produce Safety and Quality**
Room M108
Organizers: Joelle K. Salazar, Kristin M. Schill, Siyun Wang
Convenors: Yingshu He, Joelle K. Salazar, Siyun Wang
Sponsored by the IAFP Foundation

Advanced Molecular Analytics
Applied Laboratory Methods
Fruit and Vegetable Safety and Quality

3:45 The Lettuce Microbiome from Farm through Storage
MARIA BRANDL, U.S. Department of Agriculture – FSIS, Albany, CA, USA

4:15 Using Microbial Community Profiling to Inform Public Health Decisions
KAREN JARVIS, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

4:45 What We Can (Not) Expect from Microbiome Studies to Control Human Pathogens in Fresh Produce
MIEKE UYTTENDAELE, Ghent University, Ghent, Belgium

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S28 **Looking to the Future: What Do Decision Makers Want to Know or Need to Know about Managing Chemical Contaminants in Food?**
Room M109
Organizers: Yuhuan Chen, Sherri Dennis, Paul Hanlon
Convenors: Yuhuan Chen, Rhoma Johnson

Food Chemical Hazards and Food Allergy
HACCP Utilization and Food Safety Systems
Microbial Modelling and Risk Analysis

3:45 FDA's Ongoing Initiative to Protect Consumers from Toxic Metals in Foods
CONRAD CHOINIERE, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

4:15 Analysis of Hazards of Heavy Metals in Infant and Toddler Foods and Communication of Potential Health Risks to Stakeholders
TUNDE AKINLEYE, Consumer Reports, Yonkers, NY, USA

4:45 Industry Perspective on Managing Perceptions of Chemical Hazards and How the Industry Responds to Regulatory Requirements in the World of Social Media and Chemophobia
STEVEN HERMANSKY, Conagra Brands, Omaha, NE, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S29 **Statistical Methods for Microbial Data and Process Validation: The *P*-value is What?**
Room M112
Organizers: Nathan Anderson, Susanne Keller, Bradley Marks
Convenors: Nathan Anderson, Lisa Lucore

Beverages and Acid/Acidified Foods
Low Water Activity Foods
Microbial Modelling and Risk Analysis

3:45 P-hacking: Forcing Statistically Significant Results
JOHN IHRIE, U.S. Food and Drug Administration–CFSAN, College Park, MD, USA

4:15 Design of a Process Validation Based on Statistical Power and Reliability
IAN HILDEBRANDT, Michigan State University, East Lansing, MI, USA

4:45 Practical Restraints to Validation Testing: Industry Perspective
ANTHONY GUALTIERI, Kellogg's, Battle Creek, MI, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT4 ***Cyclospora*: It's Not Just an Imports' Issue**
Ballroom C
Organizer and Convenor: Kari Irvin

Epidemiology
Fruit and Vegetable Safety and Quality
Viral and Parasitic Foodborne Disease

3:45 Panelists:

SAMIR ASSAR, U.S. Food and Drug Administration, College Park, MD, USA

MONDAY PM

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

JENNIFER MCENTIRE, United Fresh, Washington, D.C., USA

MICHAEL OSTERHOLM, University of Minnesota, Minneapolis, MN, USA

WALTER RAM, Giumarra Companies, Tuscon, AZ, USA

TRISHA ROBINSON, Minnesota Department of Health, Minneapolis, MN, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT5 **#FoodSafety: Practical Advice for Digital Communication and Science Storytelling**
Room M100
Organizers: Minh Duong, Katie Overbey, Mary Yavelak
Convenor: Katie Overbey

Communication, Outreach and Education
Food Safety Culture
Food Safety Education

3:45 Panelists:
MICHAEL BATZ, U.S. Food and Drug Administration, Silver Spring, MD, USA

BENJAMIN CHAPMAN, North Carolina State University, Raleigh, NC, USA

AUBREY PARIS, Institute on Science for Global Policy, Princeton, NJ, USA

TRACIE SEWARD, Association of Schools and Programs of Public Health, Washington, D.C., USA

ADAM YEE, My Food Job Rocks, Sacramento, CA, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

T3 **Technical Session 3 – Produce**
Room M104
Convenors: Norma Heredia, Kristin Woods

T3-01 1:30 Prevalence and Fitness of Produce-Outbreak Associated *Salmonella enterica* in Tomato Plants
KELLIE P. BURRIS, Otto Simmons, Robin Grant Moore, Hannah M. Webb, Lee-Ann Jaykus, Jie Zheng, Elizabeth Reed, Christina M. Ferreira, Eric Brown, Rebecca L. Bell, North Carolina State University, Raleigh, NC, USA

T3-02 1:45 Logistical Challenges and Lessons Learned in an International Supply Chain Study to Evaluate the Influence of Packaging Type on Broccoli Quality and Food Safety Attributes
Nicholas Berus, Maria Corridini, Joellen Feirtag, LYNNE MCLANDSBOROUGH, University of Massachusetts, Amherst, MA, USA

T3-03 2:00 Detection and Prevalence of *Listeria* in Produce Packing and Fresh-cut Operations.
GENEVIEVE SULLIVAN, Martin Wiedmann, Cornell University, Ithaca, NY, USA

T3-04 2:15 Prevalence and Antimicrobial Resistance of *Listeria* spp. from Pacific Northwest Produce Processing and Handling Environments
JOHN JORGENSEN, Joy Waite-Cusic, Jovana Kovacevic, Oregon State University, Portland, OR, USA

T3-05 2:30 Impact of Various Post-harvest Wash Water Conditions on the Performance of Peracetic Acid over Time
AMANDA KINCHLA, Tiah Ghostlaw, Maria Corradini, Wes Autio, University of Massachusetts, Amherst, MA, USA

T3-06 2:45 Evaluation of Abiotic Bacterial Surrogates for Validation and Verification of One-pass Produce Wash Systems
Laurie Clotilde, Xiangwu Nou, Yaguang Luo, Eric Wilhelmsen, ADAM IDOINE, Bin Zhou, Samantha Bolten, Ganyu Gu, Antonios Zografos, SafeTraces, Pleasanton, CA, USA

3:00 Break – Refreshments Available in the Exhibit Hall

T3-07 3:45 Disinfection of Minimally Processed Pineapple Using *Enterococcus faecium* as a Surrogate for *Salmonella enterica*
CAMILA NAVARRO, Montserrat Hernández-Iturriaga, Universidad Autónoma de Querétaro, Querétaro, QA, Mexico

T3-08 4:00 Application of Ultraviolet Light in Combination of Peracetic Acid Washing to Inactivate *Salmonella* on Shredded Iceberg Lettuce
SHIYUN YAO, Beth Lipperman, Haiqiang Chen, University of Delaware, Newark, DE, USA

T3-09 4:15 A Mathematical Model for Chlorine Kinetics and Pathogen Cross-Contamination in Fresh Produce Was Processes
Parthasarathy Srinivasan, Daniel Munther, MOHAMMADREZA ABNAVI, Chandrasekhar Kothapalli, Cleveland State University, Cleveland, OH, USA

T3-10 4:30 Fate of Injured *Salmonella* and *Escherichia coli* O157:H7 on Granny Smith Apples after Cold Plasma and Organic Acid Treatment
DIKE UKUKU, Brendan A. Niemira, Sudarsan Mukhopadhyay, U.S. Department of Agriculture-ARS-ERRC-FSIT, Wyndmoor, PA, USA

T3-11 4:45 Influence of Bacteriophage in the Control of Stress-adapted *Listeria monocytogenes* Inoculated on Fresh-cut Produce
ADEBOLA OLADUNJOYE, Oluwatosin Ademola Ijabadeniyi, University of Ibadan, Ibadan, Nigeria

T3-12 5:00 Some Steps Toward Validating a Fresh-cut Process to Meet the Food Safety Modernization Act Requirements
ERIC WILHELMSEN, Christopher McGinnis, Steven Huang, Florence Wu, FREMONTA, Fremont, CA, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

T4 **Technical Session 4 – Antimicrobials**
Room M107
Convenors: Deann Akins-Lewenthal, Yifan Zhang

T4-01 1:30 Antimicrobial Resistance in Retail Ground Beef with and without a "Raised without Antibiotics" Claim
JOHN SCHMIDT, Amit Vikram, Kevin Thomas, Terrance Arthur, Margaret Weinroth, Jennifer Parker, Ayanna Hanes, Ifigenia Geornaras, Paul Morley, Tommy Wheeler, Keith Belk, U.S. Department of Agriculture – ARS, Clay Center, NE, USA

T4-02 1:45 Antimicrobial Effect of Major Components of Berry Phenolic Extract against *Campylobacter*
ZAJEBA TABASHSUM, Ashley Houser, Joselyn Padilla, Debabrata Biswas, University of Maryland, College Park, MD, USA

T4-03 2:00 Isolation and Assessment of Poultry-derived Lactic Acid Bacteria for Their Use as Host-specific Probiotics
ALYXANDRA REED, Amy Mann, Henk den Bakker, Center for Food Safety, University of Georgia, Griffin, GA, USA

T4-04 2:15 Investigation of the In-feed Reduction of the Antimicrobial Tylosin on Antimicrobial Resistance (AMR) in Enterococci in Feedlot Cattle
TAYLOR DAVEDOW, Claudia Narvaez-Bravo, Rahat Zaheer, Haley Sanderson, Argenis Rodas-Gonzalez, Cassidy Klima, Calvin Booker, Sherry Hannon, Ana Bras, Sheryl Gow, Kim Stanford, Tim A McAllister, University of Manitoba, Winnipeg, MB, Canada

T4-05 2:30 Efficacy of Chlorhexidine Digluconate and Alkyltrimethylammonium Bromide for Carcass Decontamination to Ensure Food Safety
MAJHER SARKER, Wilbert Long III, Bassam A. Annous, George Paoli, U.S. Department of Agriculture – ARS, Wyndmoor, PA, USA

T4-06 2:45 Synergistic Effect of Bacteriophages and Buffered Vinegar on *Listeria*-contaminated Ready-to-Eat Products
Sonali Sirdesai, Giovanni Eraclio, Alessandra Moncho, ROBIN PETERSON, Joël van Mierlo, Steven Hagens, Bert de Vegt, Micreos Food Safety B.V., Atlanta, GA, USA

3:00 Break – Refreshments Available in the Exhibit Hall

T4-07 3:45 Use of Medium Chain Fatty Acids to Mitigate *Salmonella* Typhimurium (ATCC 14028) in Dry Pet Food Kibbles
JANAK DHAKAL, Charles Aldrich, Kansas State University, Manhattan, KS, USA

T4-08 4:00 Cultural and Genetic Characterization of *Escherichia* Phage OSYSP and Assessing Its Suitability for Food Safety Applications
MUSTAFA YESIL, En Huang, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

T4-09 4:15 Synergistic Antimicrobial Activity between Physical Treatments and Lauric Arginate: Mechanisms Beyond Membrane Damage
XU YANG, Rewa Rai, Nitin Nitin, University of California-Davis, Davis, CA, USA

T4-10 4:30 Effect of D-Tryptophan on Psychrotrophic Growth of *Listeria monocytogenes* and Its Application in Milk
JIAN CHEN, Zhejiang GongShang University, Hangzhou, China

T4-11 4:45 Development of Antimicrobial Hydrogel Patches to Control *Vibrio parahaemolyticus* in Raw Fish
HYEMIN OH, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

T4-12 5:00 Effects of Interventions on Indicator Organism Levels in Beef Slaughter
J MARK CARTER, Naser Abdelmajid, Christian Gonzalez-Rivera, Rachel Whitaker, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

EVENING OPTIONS

5:15 p.m. – 6:15 p.m.
Exhibit Hall Reception

5:30 p.m. – 7:00 p.m.
Produce Safety Alliance, *Room M109*

AFFILIATE MEETINGS

5:30 p.m. – 6:30 p.m.
African Continental Association for Food Protection Meeting, *Room M105*

5:30 p.m. – 6:30 p.m.
China Association for Food Protection and Chinese Association for Food Protection in North America Meeting, *Room M104*

6:00 p.m. – 7:00 p.m.
Indian Association for Food Protection in North America Meeting, *Room M107*

MONDAY PM

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

NOTES

TUESDAY, JULY 23

ALL DAY

8:30 a.m. – 6:15 p.m. — *Exhibit Hall*

Poster Session 2

Antimicrobials	Dairy	Pre-harvest Food Safety
Produce	Sanitation and Hygiene	Viruses and Parasites

P2-01 through P2-141 – Authors present 10:00 a.m.– 11:30 a.m. and 5:15 p.m. – 6:15 p.m.
P2-142 through P2-262 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m.

MORNING

8:30 a.m. – 12:15 p.m.

Ballroom A	S30	The Use of Rapid Microbial Methods by Government Agencies for "Official" Testing
Room M100	S31	New Research Findings – Control of *Listeria* in Dairy
Room M105	T5	Technical Session 5 – Laboratory and Detection Methods
Room M109	T6	Technical Session 6 – General Microbiology and Viruses and Parasites

8:30 a.m. – 10:00 a.m.

Ballroom C	S32	A Precarious Balancing Act: Co-managing Preharvest Environments to Maximize Food Safety, Sustainability, and Economic Viability of Farm Operations
Ballroom D	RT6	Supply Chain Verification of a Sanitation Program
Ballroom E	S33	Emerging Hazards Associated with Seafood
Room M104	S34	Fact or Fiction: Combatting Consumer Perceptions of Food Safety Myths with Data
Room M107	S35	Future Pains: Assessing the Long-term Consequences of Foodborne Exposure to Microbial and Chemical Hazards
Room M108	S36	Challenges of Sanitation in Dry Processing Environments: What are the Evolving Methods?
Room M112	S37	*Campylobacter*, Health Impact, Performance Objectives and Effectiveness of Sampling Plans

10:00 a.m. – 10:45 a.m. — **Break – Refreshments Available in the Exhibit Hall**

10:45 a.m. – 12:15 p.m.

Ballroom C	S38	When the *Enterobacteriaceae* Hits the Fan: Wind and Particulate-associated Distribution of Foodborne Pathogens
Ballroom E	S39	What Do We Know about Microplastics in Food and Their Impact on Human Health?
Room M107	S40	The Mitigation and Regulation of Heat-formed Substances Produced in Foods during Cooking: What are the Unintended Consequences on Microbial Safety and Public Health?
Room M108	S41	Strategies to Prevent Pathogen Contamination in Post-lethality Dry and Wet Environments
Room M112	S42	Challenges in *Campylobacter* Detection and Control
Ballroom D	RT7	Home Food Delivery: The Last Mile is Not What It Used to be
Room M104	RT8	Cultural Influences on Food Safety Research and Education Programs in a Global Society

12:00 p.m. – 1:30 p.m. — **Lunch Available in the Exhibit Hall**

AFTERNOON

12:30 p.m. – 1:15 p.m.

Room M101 — IAFP Business Meeting

1:30 p.m. – 5:15 p.m.

Room M105	T7	Technical Session 7 – Microbial Food Spoilage, Dairy, and Sanitation and Hygiene
Room M109	T8	Technical Session 8 – Communication, Education and Outreach and Retail and Food Service Safety

1:30 p.m. – 3:00 p.m.

Ballroom A	S43	Are There Instructions Included? The Role of Regionality and Experimental Choices on the Survival of Foodborne Pathogens in Manure-amended Soils
Ballroom C	S44	Updates on the Impact of Sampling Plans on Food Safety
Ballroom D	RT9	Challenges in Low-moisture Food Plant Sanitation – A Dairy Perspective
Ballroom E	RT10	Food Workers – Technology Approaches and Other Interventions for Keeping Sick People Out of the Operation
Room L015	SF1	Predictive Microbiology and Risk Assessment Software Fair: Spotlight on Case Studies
Room M100	S45	Updates to the Conference for Food Protection and the Food Code
Room M104	RT11	Revitalizing the Future of Food Safety Extension
Room M107	S46	Is *Bacillus cereus* the Next Big Thing to Worry about in the Food Industry?
Room M108	RT12	Examining the Mutual Benefits of a Defined Supplier Monitoring Program: What is the Value of a Supplier Monitoring Program to the Retailer or Food Service Company and Suppliers?
Room M112	RT13	Scientific Modernization of Meat Inspection – The International High Speed Train – Catch It or Get De-Railed

3:00 p.m. – 3:45 p.m. — **Break – Refreshments Available in the Exhibit Hall**

3:45 p.m. – 5:15 p.m.

Ballroom A	S47	Advancing the Science of Risk-based Criteria for Agricultural Water Quality
Ballroom C	RT14	The Use of Chemicals in Food Hygiene and Linkage to Microbial Resistance
Ballroom D	RT15	Cottage Foods: Harmonizing Food Safety Practices for a Growing Entrepreneurial Industry
Ballroom E	S48	Determining Preventive Controls for Viruses and Parasites
Room L015		Dubai Food Watch Presentation
Room L017	SF2	Predictive Microbiology and Risk Assessment Software Fair: Demonstrations
Room M100	RT16	Has the Time Come for Complete Adoption of the Food Code?
Room M104	S49	Communicating Benefit/Risk Analysis of Food Processing
Room M107	S50	*Clostridium difficile*: A Food Safety Risk?
Room M108	RT17	Finding the Needle in the Cheese Block: How Do We Create Robust Sampling Plans for Dairy Products?
Room M112	S51	Challenges and Promises of Using Quantitative Data for Controlling *Salmonella* in Poultry

EVENING OPTIONS

5:15 p.m. – 6:15 p.m. **Exhibit Hall Reception**

6:30 p.m. – 7:30 p.m. President's Reception (by Invitation), *Omni Hotel*
7:00 p.m. – 9:00 p.m. Student Mixer, *Seelbach Hilton, Rathskeller*

AFFILIATE MEETINGS

5:30 p.m. – 6:30 p.m. Korea Association for Food Protection, *Room M104*
5:30 p.m. – 6:30 p.m. Southeast Asia Association for Food Protection, *Room M105*
6:00 p.m. – 7:00 p.m. Latin America Group Meeting, *Room M107*

TUESDAY MORNING JULY 23

Posters will be on display 8:30 a.m. – 6:15 p.m.
(See details beginning on page 71)

S30 The Use of Rapid Microbial Methods by Government Agencies for "Official" Testing

Ballroom A
Organizer: DeAnn Benesh
Convenors: DeAnn Benesh, Deon Mahoney

Applied Laboratory Methods
Food Law
International Food Protection Issues

8:30 European Process to Accept the Use of Rapid Microbial Methods
PAUL IN'T VELD, Netherland Food and Product Safety Authority, Utrecht, The Netherlands

9:00 Dubai Food Safety Process to Accept the Use of Rapid Microbial Methods
BOBBY KRISHNA and FATIMA FIKREE, Food Safey Dubai, Dubai, Dubai Municipality

9:30 U.S. FDA Process to Accept the Use of Rapid Microbial Methods
THOMAS HAMMACK, U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, College Park, MD, USA

10:00 Break – Refreshments Available in the Exhibit Hall

10:45 New Zealand Ministry of Primary Industries Process to Accept Rapid Microbial Methods
MARION CASTLE, New Zealand Ministry for Primary Industries, Wellington, New Zealand

11:15 Chilean Ministry of Agriculture Process to Accept the Use of Rapid Microbial Methods
CONSTANZA VERGARA ESCOBAR, Chilean Food Safety And Quality Agency, Achipia, Ministry of Agriculture, Santiago, Chile

11:45 USDA FSIS Process to Accept the Use of Rapid Microbial Methods
JOSE EMILIO ESTEBAN, USDA FSIS Office of Public Health, Washington, D.C., USA

12:15 Lunch Available in the Exhibit Hall

S31 New Research Findings – Control of *Listeria* in Dairy

Room M100
Organizers: Sarah Engstrom, Chad Galer, Christina Stam
Convenors: Chad Galer, Timothy Stubbs
Sponsored by Dairy Management Inc.

Dairy Quality and Safety
Developing Food Safety Professionals
Food Hygiene and Sanitation

8:30 Combinations of Acid Type, pH, and Commercial Clean Label Antimicrobial Ingredients on the Growth of *Listeria monocytogenes* in High-moisture Cheese
KATHLEEN GLASS, University of Wisconsin-Madison, Madison, WI, USA

9:00 Antimicrobial Strategies for the Control of *Listeria monocytogenes* on High-moisture Cheese
DENNIS D'AMICO, University of Connecticut, Department of Animal Science, Storrs, CT, USA

9:30 Controlling *Listeria monocytogenes* in High Risk Cheeses by Treatment with High Voltage Atmospheric Cold Plasma (HVACP)
KEVIN KEENER, Iowa State University, Ames, IA, USA

10:00 Break – Refreshments Available in the Exhibit Hall

10:45 Inhibition of *Listeria monocytogenes* on Cheese Using Lactic Acid Bacteria as a Biocontrol System Intervention
KENDRA NIGHTINGALE, Texas Tech University, Lubbock, TX, USA

11:15 Functionalized Mesh Materials for *Listeria* Mitigation in Milk and Milk-derived Products Processed in Dairy Plants
STEPHAN RITCHIE, University of Alabama, Tuscaloosa, AL, USA

11:45 Understanding Regulation of *Listeria monocytogenes* Cell Envelope Composition to Facilitate Development and Discovery of Improved Control Strategies
MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA

12:15 Lunch Available in the Exhibit Hall

S32 A Precarious Balancing Act: Co-managing Preharvest Environments to Maximize Food Safety, Sustainability, and Economic Viability of Farm Operations

Ballroom C
Organizers and Convenors: Angela Marie C. Ferelli, Matthew Moore, Daniel Weller
Sponsored by the IAFP Foundation

Food Sustainability
Pre Harvest Food Safety
Water Safety and Quality

8:30 The Ecological Impacts of Food Safety: A Review of the Existing Literature
MICHELE JAY-RUSSELL, Western Center for Food Safety, University of California-Davis, Davis, CA, USA

9:00 Co-managing Farms for Food Safety and Conservation: A Review of Farm Practices and Needs
PATRICK BAUR, University of California, Berkeley, Berkeley, CA, USA

9:30 Co-managing Farm Environments to Promote Biotic Resistance to Foodborne Pathogens
MATTHEW JONES, Washington State University, Pullman, WA, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S33 Emerging Hazards Associated with Seafood

Ballroom E
Organizer and Convenor: Jessica Jones
Sponsored by the IAFP Foundation

Epidemiology
Seafood Safety and Quality
Viral and Parasitic Foodborne Disease

8:30 Parasites in Finfish. What's the Risk?
MELANIE GAY, ANSES, Boulogne-sur-Mer, France

9:00 Raw Seafood as a Vector for Hepatitis A Virus: Not the Usual Suspects
JACQUELINA WOODS, U.S. Food and Drug Administration, Dauphin Island, AL, USA

9:30 Diarrhetic Shellfish Poisoning: A Global Spread
STACEY MCLEROY, U.S. Food and Drug Administration, College Park, MD, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S34 **Fact or Fiction: Combatting Consumer Perceptions of Food Safety Myths with Data**
Room M104
Organizers: Benjamin Chapman, Rebecca Goulter, Margaret Kirchner
Convenors: Margaret Kirchner, Ellen Thomas

Communication, Outreach and Education
Food Safety Culture
Food Safety Education

8:30 The 5-second Rule/Handwashing Times: What are the Facts?
DONALD W. SCHAFFNER, Rutgers University, New Brunswick, NJ, USA

9:00 Home Food Preservation Myths
ELIZABETH L. ANDRESS, University of Georgia, Athens, GA, USA

9:30 Utilizing Consumer Handling Data on Poultry Washing and Thermometer Use to Develop Methods Address Myths
AARON LAVALLEE, U.S. Department of Agriculture Food Safety and Inspection Service, Washington, D.C., USA

10:00 Break – Refreshments Available in the Exhibit Hall

S35 **Future Pains: Assessing the Long-term Consequences of Foodborne Exposure to Microbial and Chemical Hazards**
Room M107
Organizers: Michael Batz, Yuhuan Chen, Barbara Kowalcyk
Convenors: Michael Batz, Peter Ben Embarek
Sponsored by the IAFP Foundation

Epidemiology
Food Chemical Hazards and Food Allergy
Microbial Modelling and Risk Analysis

8:30 Scoping Review of Literature for Long-term Sequelae of Foodborne Infections
KRISTEN POGREBA-BROWN, University of Arizona, Tucson, AZ, USA

9:00 Utilizing Alternative Data Sources to Assess the Long-term Health Outcomes of Foodborne Disease
BARBARA KOWALCYK, The Ohio State University, Columbus, OH, USA

9:30 Advancing the Understanding of Chronic Effects from Chemical Agents Using Novel Predictive Toxicology Tools
SUZANNE FITZPATRICK, U.S. Food and Drug Administration, College Park, MD, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S36 **Challenges of Sanitation in Dry Processing Environments: What are the Evolving Methods?**
Room M108
Organizers: Elizabeth Grasso-Kelley, Susanne Keller, Aparna Tatavarthy
Convenors: Pablo Alvarez, Aparna Tatavarthy

Food Hygiene and Sanitation
Low Water Activity Foods.
Sanitary Equipment and Facility Design

8:30 Use of Purge Materials and Mechanical Cleaning Methods for Allergen Control in Chocolate and Other Difficult-to-Clean Production Environments
LAUREN JACKSON, U.S. Food and Drug Administration, Bedford Park, IL, USA

9:00 Evaluation of Material Purging as a Microbial Risk Reduction Strategy for Low-moisture Equipment
QUINCY SUEHR, U.S. Food and Drug Administration, Bedford Park, IL, USA and ELIZABETH GRASSO-KELLEY, Illinois Institute of Technology, Bedford Park, IL, USA

9:30 Advantages and Practicality of Dry Sanitation Methods to Prevent Cross-contamination on Floors and Entry-ways, and Dry Gas Methods to Complement Sanitation
ALEX JOSOWITZ, Sterilex Corporation, Hunt Valley, MD, USA and KEVIN LORCHEIM, ClorDiSys Solutions, Lebanon, NJ, USA

10:00 Break – Refreshments Available in the Exhibit Hall

S37 ***Campylobacter*, Health Impact, Performance Objectives and Effectiveness of Sampling Plans**
Room M112
Organizers: Jeffrey Farber, Leon Gorris, Marcel Zwietering,
Convenor: Leon Gorris
Sponsored by the IAFP Foundation

International Food Protection Issues
Meat and Poultry Safety and Quality
Microbial Modelling and Risk Analysis

8:30 Health Impact of *Campylobacter*: The Main Zoonotic Pathogen in Many Countries
JEFFREY FARBER, University of Guelph, CRIFS, Guelph, ON, Canada

9:00 Establishing Performance Objectives throughout the Chicken Production Chain to Account for Control Measures
LEON GORRIS, Food Safety Expert, Nijmegen, The Netherlands

9:30 Effectiveness of a (More and More Stringent) Sampling Plan for *Campylobacter*
MARCEL ZWIETERING, Wageningen University, Wageningen, The Netherlands

10:00 Break – Refreshments Available in the Exhibit Hall

RT6 **Supply Chain Verification of a Sanitation Program**
Ballroom D
Organizers: Angela Anandappa, Vanessa Cranford, Elise Forward
Convenor: Angela Anandappa, Vanessa Cranford

Food Hygiene and Sanitation
HACCP Utilization and Food Safety Systems
Retail and Foodservice

8:30 Panelists:
RICHARD BROUILLETTE, Commercial Food Sanitation, South Burlington, VT, USA
NADIA NARINE, Lumar Food Safety Ltd., Richmond Hill, ON, Canada
GORDON HAYBURN, Trophy Foods Inc., Mississauga, ON, Canada
JESSICA JONES, Chick-fil-A, Inc., Atlanta, GA, USA
EVAN ROSEN, Tate & Lyle, Hoffman Estates, IL, USA
RICK STOKES, Ecolab Inc., Eagan, MN, USA

10:00 Break – Refreshments Available in the Exhibit Hall

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

S38 **When the *Enterobacteriaceae* Hits the Fan: Wind and Particulate-associated Distribution of Foodborne Pathogens**
Ballroom C
Organizers: Govindaraj Dev Kumar, Divya Jaroni
Convenors: Govindaraj Dev Kumar, Joyjit Saha

Epidemiology
Pre Harvest Food Safety

10:45 Airborne Dispersal of Foodborne Pathogens in Tree Fruit Production Environments
DUMITRU MACARISIN, U.S. Food and Drug Administration, College Park, MD, USA

11:15 Dust, Wind and Produce Safety
DE ANN DAVIS, Church Brothers Farms, Salinas, CA, USA

11:45 Surviving the Storm with FSMA Compliance
DAVID INGRAM, U.S. Food and Drug Administration – CFSAN, College Park, MD, USA

12:15 Lunch Available in the Exhibit Hall

S39 **What Do We Know about Microplastics in Food and Their Impact on Human Health?**
Ballroom E
Organizer: Tori Stivers
Convenors: Angela Anandappa, Tori Stivers
Sponsored by University of Georgia-Marine Extension and Georgia Sea Grant and the IAFP Foundation

Food Chemical Hazards and Food Allergy
International Food Protection Issues
Seafood Safety and Quality

10:45 Microplastics in the Environment and Food: Sources, Contamination, and the Current State of Research
GARTH COVERNTON, University of Victoria, Victoria, BC, Canada

11:15 Interactions between Microplastics and Shellfish Species
J. EVAN WARD, University of Connecticut, Groton, CT, USA

11:45 Dietary Exposure of Humans to Microplastics and Plastic-associated Chemicals
BART KOELMANS, Wageningen University and Research, Wageningen, The Netherlands

12:15 Lunch Available in the Exhibit Hall

S40 **The Mitigation and Regulation of Heat-formed Substances Produced in Foods during Cooking: What are the Unintended Consequences on Microbial Safety and Public Health?**
Room M107
Organizer: Imad Saab
Convenor: Steven Hermansky
Sponsored by ILSI North America Food Chemical Safety Committee

Food Chemical Hazards and Food Allergy
Heat Formed Substances in Foods

10:45 Genetic Evidence of Human Adaptation to a Cooked Diet and Its Role in Human Health and Food Safety
STEVEN HERMANSKY, Conagra Brands, Chicago, IL, USA

11:15 Balancing Microbial Food Safety Risks with Mitigating Heat-formed Substances in Foods
SCOTT HOOD, General Mills, St. Paul, MN, USA

11:45 The Need for a Holistic Toxicological Assessment of Heat-formed Substances within a Food Matrix
MICHAEL DOURSON, TERA, Cincinnati, OH, USA

12:15 Lunch Available in the Exhibit Hall

S41 **Strategies to Prevent Pathogen Contamination in Post-lethality Dry and Wet Environments**
Room M108
Organizer and Convenor: Rocelle Clavero

Food Safety Assessment, Audit and Inspection
HACCP Utilization and Food Safety Systems
Sanitary Equipment and Facility Design

10:45 Areas of Concern in Wet Processes after a Validated Kill Step
LORALYN LEDENBACH, Kraft Heinz Company, Glenview, IL, USA

11:15 Areas of Concern in Dry Processes and Environments
LILIA SANTIAGO, Kellogg's, Battle Creek, MI, USA

11:45 Ancillary Systems and Equipment Design That Can Pose a Risk of Recontamination
JOHN HOLAH, UK:IE EHEDG & Holchem Laboratories Ltd., Bury, United Kingdom

12:15 Lunch Available in the Exhibit Hall

S42 **Challenges in *Campylobacter* Detection and Control**
Room M112
Organizer and Convenor: Nabila Haddad
Sponsored by the IAFP Foundation

Meat and Poultry Safety and Quality
Microbial Modelling and Risk Analysis

10:45 Challenges of *Campylobacter* Detection; Effect of Strain Variability and Competitive Flora on Enrichment-based Detection Procedures
HEIDY DEN BESTEN, Wageningen University, Wageningen, The Netherlands

11:15 Survival of *Campylobacter* in the Food Chain; Robustness of Model Prediction Using Molecular Markers
BENJAMIN DUQUÉ, UMR1014 Secalim, INRA, Oniris, Nantes, France

11:45 Efficacy of Control Measures – Lessons Learned and Regulatory Aspects
MICHAEL WILLIAMS, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

12:15 Lunch Available in the Exhibit Hall

RT7 **Home Food Delivery: The Last Mile is Not What It Used to be**
Ballroom D
Organizer and Convenor: Dale Grinstead

Communication, Outreach and Education
Food Law
Retail and Foodservice

10:45 Panelists:
MELANIE ABLEY, U.S. Department of Agriculture–FSIS, Springfield, VA, USA
ALLISON JENNINGS, Amazon, Seattle, WA, USA
JOSEPH NAVIN, Uber, San Francisco, CA, USA
HOWARD POPOOLA, The Kroger Company, Cincinatti, OH, USA
DONALD W. SCHAFFNER, Rutgers University, New Brunswick, NJ, USA

12:15 Lunch Available in the Exhibit Hall

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

RT8 **Cultural Influences on Food Safety Research and Education Programs in a Global Society**
Room M104
Organizers: Jennifer Acuff, Minh Duong, Harry Schonberger
Convenor: Jennifer Acuff

Communication, Outreach and Education
Food Safety Culture
International Food Protection Issues

10:45 Panelists:

MARIA TERESA DESTRO, bioMérieux Inc., São Paulo, Brazil

BOBBY KRISHNA, Dubai Municipality, Dubai, United Arab Emirates

ROSE OMARI, Science and Technology Policy Research Institute Council for Scientific and Industrial Research and EATSAFE Ghana, Accra, Ghana

CHANNAH ROCK, University of Arizona, Maricopa, AZ, USA

YOHAN YOON, Sookmyung Women's University, Seoul, South Korea

12:15 Lunch Available in the Exhibit Hall

T5 **Technical Session 5 – Laboratory and Detection Methods**
Room M105
Convenors: Preetha Biswas, Xiangyu Deng

T5-01 8:30 Evaluation of Commercial Molecular Screening Platforms for the Detection of Foodborne Bacterial Pathogens by Food Safety and Inspection Service Field Service Laboratories
WILLIAM SHAW, Jose Emilio Esteban, U.S. Department of Agriculture-FSIS-OPPD, Washington, D.C., USA

T5-02 8:45 Untargeted Screening of the United States Food Supply to Detect Novel and Emerging Contaminants
ERICA BAKOTA, Robert Levine, U.S. Food and Drug Administration, Lenexa, KS, USA

T5-03 9:00 Non-Targeted Identification of Food Adulterants Using Handheld Near Infrared Spectrometers
RONALD SARVER, Douglas MacRae, Brent Steiner, Robert Donofrio, Greg McNeil, Neogen Corporation, Lansing, MI, USA

T5-04 9:15 Deep Learning Methods for Classifying Shiga Toxin-producing *E. coli* with Hyperspectral Microscope Images
BOSOON PARK, Rui Kang, Matthew Eady, U.S. Department of Agriculture, ARS, Athens, GA, USA

T5-05 9:30 A Label-free QCM Biosensor for Sensitive and Rapid Detection of *E. coli* O157:H7 Based on a Multivalent Aptamer System
Ronghui Wang, Xiaofan Yu, Tieshan Jiang, Young Min Kwon, Jiangchao Zhao, Mack Ivey, YANBIN LI, Department of Biological and Agricultural Engineering, University of Arkansas, Fayetteville, AR, USA

T5-06 9:45 Reporter Bacteriophage NRGp4 Utilizes a Novel Nanoluc: CBM Fusion for the Ultrasensitive Detection of *Escherichia coli* in Water
Troy Hinkley, Spencer Garing, Sangita Singh, Anne-Laure Le Ny, Kevin Nichols, Joseph Peters, Joey Talbert, SAM NUGEN, Cornell University, Ithaca, NY, USA

10:00 Break – Refreshments Available in the Exhibit Hall

T5-07 10:45 Validation of the Liquid Crystal-based Immunoassay for Rapid Detection of *Salmonella*
Sawsan Abed, Sarah Potter, SOOHYOUN AHN, University of Florida, Gainesville, FL, USA

T5-08 11:00 ISO 16140-2 Validation of the GeneDisc STEC Method for Analysis of Raw Beef Meat
Justine Baguet, Christophe Quere, Cécile Bernez, Maryse Rannou, SYLVIE HALLIER-SOULIER, Pall Corporation, Bruz, France

T5-09 11:15 Rapid Detection of Enrofloxacin in Poultry Using a Localized Surface Plasmon Resonance Sensor Based on Polydopamine Surface Imprinted Recognition Polymer
WENQIAN WANG, Ronghui Wang, Ming Liao, Yanbin Li, Deparment of Poultry Science, University of Arkansas, Fayetteville, AR, USA

T5-10 11:30 AquaSpark, a Novel Chemiluminescent Technology Platform for Dynamic Monitoring of Environmental Bacteria
MARIO HUPFELD, Nadine Heinrich, Lukas Reinau, Lars Fieseler, Julian Ihssen, Nemis Technologies, Zürich, Switzerland

T5-11 11:45 Modifying the Double Layer Plaque Assay for Accurate Phage Titer Determinations: Effect of Solidifying Agent Type and Concentration
MUSTAFA YESIL, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

T5-12 12:00 Deciphering the Antibiotic Resistance Mechanism of *Campylobacter* Using Confocal Micro-Raman Spectroscopy
LUYAO MA, Xiaonan Lu, Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, BC, Canada

12:15 Lunch Available in the Exhibit Hall

T6 **Technical Session 6 – General Microbiology and Viruses and Parasites**
Room M109
Convenor: Bassam A. Annous

T6-01 8:30 Photodynamic Inactivation of Human Norovirus Surrogates in Water
HAMADA ABOUBAKR, Yan Feng, Sagar Goyal, University of Minnesota, St. Paul, MN, USA

T6-02 8:45 Evaluation of Viral Food Safety Risks of Reusing Tailwater for Leafy Green Production
XI WU, Erin DiCaprio, University of California-Davis, Davis, CA, USA

T6-03 9:00 The Potential of Pulsed UV Light to Inactivate *Cryptosporidium parvum* Oocysts on High-risk Commodities (Mesclun Lettuce, Spinach, Cilantro, and Tomatoes)
SHANI CRAIGHEAD, Haiqiang Chen, Kali Kniel, University of Delaware, Newark, DE, USA

T6-04 9:15 Validation of Industrial Equipment Designed to Apply Peracetic Acid-based Sanitizing Solution on Chia Seeds Using a *Salmonella* Surrogate, *Enterococcus faecium* NRRL B-2354
REBECCA KAREN HYLTON, Alma Fernanda Sanchez-Maldonado, Pooneh Peyvandi, Fatemeh Rahmany, Fadi Dagher, Amir Hamidi, Agri-Neo Inc., Toronto, ON, Canada

T6-05 9:30 Characterization of Bacteriophage T4-Insensitive *Escherichia coli* via Comparative Correlation of Genomic and Phenotypic Microarray Data
ZEYAN ZHONG, Jean-Guillaume Emond-Rheault, Jeremie Hamel, Irena Kukavica-Ibrulj, Roger Levesque, Yujie Hu, Séamus Fanning, Lawrence Goodridge, McGill University, Ste-Anne-de-Bellevue, QC, Canada

T6-06 9:45 *Ybgc* Regulates Cell Membrane Integrity and Fatty Acid Composition of *Salmonella* Enteritidis in Response to Lysozyme
XIAOJIE QIN, Zengfeng Zhang, Jingxian Yang, Yan Cui, XiuJuan Zhou, Xianming Shi, Shanghai Jiao Tong University, Shanghai, China

10:00 Break – Refreshments Available in the Exhibit Hall

T6-07 10:45 Prevalent Terpenes and Their Inhibitory Effects on *Escherichia coli* O157:H7 in Fresh Cheese Made with Oregano and Rosemary Essential Oils during Storage
Helena Tainá Diniz-Silva, Larissa Ramalho Brandão, Josean Santos, Evandro L. de Souza, MARCIANE MAGNANI, Federal University of Paraiba, João Pessoa, Brazil

T6-08 11:00 Directed Evolution of *Bacillus cereus* Endospores with UV-C Stress Resulted in an Increased UV-C Resistance of Spores But Limited Effect on Their Vegetative Cells
KATRIEN BEGYN, Tom Dongmin Kim, Fatima Taghlaoui, Marc Heyndrickx, Abram Aertsen, Chris Michiels, Andreja Rajkovic, Frank Devlieghere, Ghent University, Ghent, Belgium

T6-09 11:15 Investigation of a Lytic *Bacillus cereus* Phage with High Specificity and High Stability Under Various Stressed Conditions
IN YOUNG CHOI, Leesun Kim, Mi-Kyung Park, Kyungpook National University, Daegu, South Korea

T6-10 11:30 *Salmonella* Serotype Fitness in Various Water Types and Habitat Transition from Water to Tomato Fruit
ANGELA MARIE C. FERELLI, Shirley A. Micallef, University of Maryland, College Park, MD, USA

T6-11 11:45 Evaluation of a Typing Scheme Based on Deep Amplicon Sequencing to Aid Epidemiological Linkage of Cyclosporiasis Cases
Joel Barratt, Fernanda Nascimento, Katelyn Houghton, Mateusz Plucinski, Eldin Talundzic, Richard Bradbury, Michael Arrowood and YVONNE QVARNSTROM, Centers for Disease Control and Prevention (CDC), Atlanta, GA

T6-12 12:00 Safety Status of Some Traditionally Fermented Foods in Nigeria
ADEWALE OLUSEGUN OBADINA, Federal University of Agriculture Abeokuta, Abeokuta, Nigeria

12:15 Lunch Available in the Exhibit Hall

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

TUESDAY AFTERNOON JULY 23

Posters will be on display 8:30 a.m. – 6:15 p.m.
(See details beginning on page 71)

12:30 p.m. – 1:15 p.m.
IAFP Business Meeting
Room M101

S43 Are There Instructions Included? The Role of Regionality and Experimental Choices on the Survival of Foodborne Pathogens in Manure-amended Soils

Ballroom A
Organizers: Michele Jay-Russell, Keith Schneider, Manan Sharma
Convenors: Pushpinder Kaur Litt, Manoj Shah

Fruit and Vegetable Safety and Quality
Pre Harvest Food Safety

1:30 Inside and Outside: Survival of Enteric Bacterial Pathogens in Manure-amended Soils in Field Studies and Greenhouses in the Mid-Atlantic U.S.
MANAN SHARMA, U.S. Department of Agriculture – ARS, Environmental Microbial and Food Safety Laboratory, Beltsville, MD, USA

2:00 What We Know so Far: Risk Factors for Pathogen Survival in Manure-amended Soils in California and Arizona
MICHELE JAY-RUSSELL, Western Center for Food Safety, University of California-Davis, Davis, CA, USA

2:30 Pieces of the Same Puzzle: *E. coli* Survival in Manure-amended Soils and Laboratory Microcosms
KEITH SCHNEIDER, University of Florida, Gainesville, FL, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S44 Updates on the Impact of Sampling Plans on Food Safety

Ballroom C
Organizers and Convenors: Vijay Juneja, Aixia Xu
Sponsored by the IAFP Foundation

Advanced Molecular Analytics
Microbial Modelling and Risk Analysis

1:30 The Comparison of Different Types of Sampling Plans: Why to Have so Many Different Types?
MARCEL ZWIETERING, Wageningen University, Wageningen, The Netherlands

2:00 Recent Developments of Novel Sampling Methods
AIXIA XU, U.S. Department of Agriculture – ARS, ERRC, Wyndmoor, PA, USA

2:30 Designing Efficient Sampling Plans for Enhanced Microbial Risk Management
URSULA A. GONZALES-BARRON, Polytechnic Institute of Braganza, Braganza, Portugal

3:00 Break – Refreshments Available in the Exhibit Hall

S45 Updates to the Conference for Food Protection and the Food Code

Room M100
Organizers: Judy Greig, Ewen Todd
Convenor: Ewen Todd

Food Hygiene and Sanitation
Food Law
Sanitary Equipment and Facility Design

1:30 Update for the Upcoming 2020 Conference for Food Protection
DAVID MCSWANE, Conference for Food Protection, Martinsville, IN, USA

2:00 Review of Recent Changes to the Food Code and the FDA Process of Evaluating Recommendations for Change
GIRVIN LIGGANS, U.S. Food and Drug Administration, College Park, MD, USA

2:30 An Industry Perspective on the Food Code
BRENDA BACON, Harris Teeter, Matthew, NC, USA

3:00 Break – Refreshments Available in the Exhibit Hall

S46 Is *Bacillus cereus* the Next Big Thing to Worry about in the Food Industry?

Room M107
Organizers: Florence Postollec, Sandra Tallent
Convenor: Pamela Wilger
Sponsored by UMT ACTIA 19.03 ALTER'iX and the IAFP Foundation

Advanced Molecular Analytics
Applied Laboratory Methods
Low Water Activity Foods

1:30 Available Tools to Distinguish *Bacillus cereus* Hazard
FLORENCE POSTOLLEC, ADRIA - UMT ACTIA19.03 ALTER'iX, Quimper, France

2:00 Rethinking the *Bacillus cereus* Group in the Age of Whole-Genome Sequencing
JASNA KOVAC, The Pennsylvania State University, University Park, PA, USA

2:30 Toxinogenicity of *Bacillus cereus*
SANDRA TALLENT, U.S. Food and Drug Administration, College Park, MD, USA

3:00 Break – Refreshments Available in the Exhibit Hall

SF1 Predictive Microbiology and Risk Assessment Software Fair: Spotlight on Case Studies

Room L015
Organizer and Convenor: Mariem Ellouze
Sponsored by International Committee on Food Microbiology and Hygiene (ICFMH)

Developing Food Safety Professionals
HACCP Utilization and Food Safety Systems
Microbial Modelling and Risk Analysis

1:30 Use of FDA-iRisk to Perform Microbial Risk Assessment
YUHUAN CHEN, U.S. Food and Drug Administration–CFSAN, College Park, MD, USA

1:45 Use of Combase for Formulation, HACCP and Shelf-life Studies
MARK TAMPLIN, Centre for Food Safety & Innovation, Tasmanian Institute of Agriculture, University of Tasmania, Hobart, TAS, Australia

2:00 Use of Microhibro for Risk Assessment
FERNANDO PEREZ-RODRIGUEZ, University of Cordoba, Cordoba, Spain

2:15 Use of Gropin for Shelf-life Assessment and Formulation
PANAGIOTIS SKANDAMIS, Agricultural University of Athens, Athens, Greece

2:30 Use of CB Premium for Formulation, HACCP and Shelf-life Studies
MARK TAMPLIN, Centre for Food Safety & Innovation, Tasmanian Institute of Agriculture, University of Tasmania, Hobart, TAS, Australia

2:45 Use of Sym'previus for HACCP and Shelf-life Studies
FLORENCE POSTOLLEC, ADRIA - UMT ACTIA19.03 ALTER'iX, Quimper, France

3:00 Break – Refreshments Available in the Exhibit Hall

RT9 Challenges in Low-moisture Food Plant Sanitation – A Dairy Perspective
Ballroom D
Organizers: Chad Galer, Nancy Huls, Annie Piepenhagen
Convenor: Chad Galer
Sponsored by Dairy Management Inc.

Dairy Quality and Safety
Food Hygiene and Sanitation
Low Water Activity Foods

1:30 Panelists:
SHANTANU AGARWAL, MarsWrigley, Chicago, IL, USA
NATHAN ANDERSON, U.S. Food and Drug Administration, Bedford Park, IL, USA
RICHARD BROUILLETTE, Commercial Food Sanitation, South Burlington, VT, USA
RHONDA FRASER, FONTERRA, Palmerston North, New Zealand
DEAN TJORNEHOJ, CDI, Visalia, CA, USA
STEPHEN WALKER, U.S. Food and Drug Administration, Bedford Park, IL, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT10 Food Workers – Technology Approaches and Other Interventions for Keeping Sick People Out of the Operation
Ballroom E
Organizer and Convenor: Julian Graham

Food Safety Culture
International Food Protection Issues
Retail and Foodservice

1:30 Panelists:
VERONICA BRYANT, NC Dept. of Health & Human Services, Raleigh, NC, USA
BENJAMIN CHAPMAN, North Carolina State University, Raleigh, NC, USA
ARON HALL, Centers for Disease Control and Prevention, Atlanta, GA, USA
JASON HORN, In-N-Out Burger, Baldwin Park, CA, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT11 Revitalizing the Future of Food Safety Extension
Room M104
Organizers: Nicole Arnold, Angela Marie C. Ferelli, Sarah Murphy, Lily Yang
Convenor: Angela Marie C. Ferelli

Communication, Outreach and Education
Food Safety Education
Fruit and Vegetable Safety and Quality

1:30 Panelists:
MELISSA CHASE, Virginia Tech/Virginia Cooperative Extension, Blacksburg, VA, USA
COURTNEY CRIST, Mississippi State University, Starkville, MS, USA
CATHERINE CUTTER, Penn State University, University Park, PA, USA
CONNIE FISK, Produce Safety Alliance, Plattsmouth, NE, USA
CHANNAH ROCK, University of Arizona, Maricopa, AZ, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT12 Examining the Mutual Benefits of a Defined Supplier Monitoring Program: What is the Value of a Supplier Monitoring Program to the Retailer or Food Service Company and Suppliers?
Room M108
Organizer and Convenor: Kurt Westmoreland
Sponsored by Mérieux NutriSciences

Dairy Quality and Safety
Food Safety Culture
Retail and Foodservice

1:30 Panelists:
SHARON BEALS, CTI Foods, Fort Worth, TX, USA
AUSTIN BERNARD, Chick-fil-A, Inc., Atlanta, GA, USA
PAUL HALL, Flying Food Group, Lakeland, FL, USA
WHITNEY LANGSDON, Wendy's, Columbus, OH, USA
PAM MEIJER, Mérieux NutriSciences, Chicago, IL, USA

3:00 Break – Refreshments Available in the Exhibit Hall

RT13 Scientific Modernization of Meat Inspection – The International High Speed Train – Catch It or Get De-Railed
Room M112
Organizer and Convenor: Barbara Masters

Food Safety Assessment, Audit and Inspection
Meat and Poultry Safety and Quality

1:30 Panelists:
MARTIN APPELT, Canadian Food Inspection Agency, Ottawa, ON, Canada
ROGER COOK, New Zealand Ministry for Primary Industries, Wellington, New Zealand
CARMEN ROTTENBERG, U.S. Department of Agriculture, Washington, D.C., USA

3:00 Break – Refreshments Available in the Exhibit Hall

S47 Advancing the Science of Risk-based Criteria for Agricultural Water Quality
Ballroom A
Organizers: Donna Pahl Clements, Don Stoeckel
Convenors: Channah Rock, Michelle Smith, Don Stoeckel

Fruit and Vegetable Safety and Quality
Microbial Modelling and Risk Analysis
Water Safety and Quality

3:45 Industry Perspectives on Use of Risk-based Approaches
EMILY GRIEP, United Fresh Produce Association, Washington, D.C., USA

4:15 Application of Risk-based Approaches to Managing Agricultural Water Quality
DONALD W. SCHAFFNER, Don Stoeckel, Rutgers University, New Brunswick, NJ, USA

4:45 Knowledge Gained the Hard Way: Observations from Past Outbreaks to Support Risk-based Approaches
CHARLES GERBA and CHANNAH ROCK, University of Arizona, Tucson, AZ, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S48 Determining Preventive Controls for Viruses and Parasites
Ballroom E
Organizers and Convenors: Stephen Grove, Jessica Hofstetter

Fruit and Vegetable Safety and Quality
HACCP Utilization and Food Safety Systems
Viral and Parasitic Foodborne Disease

3:45 Mitigation Strategies at Primary Production and Primary Processing to Minimize the Risk Linked to Foodborne Viruses in Mildly Processed Raw Materials
SOPHIE ZUBER, Nestlé Research Center, Lausanne, Switzerland

4:15 Considerations on the Environmental Resistance and Biological Characteristics of Foodborne Parasites in Foods
KALI KNIEL, University of Delaware, Newark, DE, USA

4:45 Preventive Controls for Viruses and Parasites in the Industry
TIMOTHY JACKSON, Driscoll's, Watsonville, CA, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S49 Communicating Benefit/Risk Analysis of Food Processing
Room M104
Organizers: Alex Eapen, Pamela Wilger
Convenor: Pamela Wilger

Communication, Outreach and Education
Food Chemical Hazards and Food Allergy
Food Processing

3:45 Toxicological Relevance of Process-formed Contaminants Versus Microbiological Risks
CHRISTINE CRINCOLI, Cargill, Inc., Minneapolis, MN, USA

4:15 BRAFO – Benefit Risk Analysis of Food Processing
CANDACE DOEPKER, ToxStrategies, Newport, KY, USA

4:45 Everyone Talks to Someone: Best Practices for Food and Chemical Risk Communication
ANTHONY FLOOD, IFIC, Washington, D.C., USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S50 *Clostridium difficile*: A Food Safety Risk?
Room M107
Organizers and Convenors: Genevieve Flock, Vijay Juneja
Sponsored by the IAFP Foundation

Meat and Poultry Safety and Quality

3:45 *Clostridium difficile* in Food and the Environment: Significant Sources of *C. difficile* Community-acquired Infection?
KEITH WARRINER, University of Guelph, Guelph, ON, Canada

4:15 Survival of *Clostridium difficile* in Low-moisture Foods
J. ANTONIO TORRES, Tecnologico de Monterrey, Monterrey, NL, Mexico

4:45 Survival of *Clostridium difficile* in Beef and Sausage: Effect of Cooking, Chilling and Freezing and Acidity
GENEVIEVE FLOCK, U.S. Army Combat Capabilities Development Command Soldier Center, Natick, MA, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

S51 Challenges and Promises of Using Quantitative Data for Controlling *Salmonella* in Poultry
Room M112
Organizers: Vikrant Dutta, Manpreet Singh
Convenors: Mark Carter, Peter Evans, Manpreet Singh
Sponsored by bioMérieux Inc. and the IAFP Foundation

Meat and Poultry Safety and Quality
Microbial Modelling and Risk Analysis
Pre Harvest Food Safety

3:45 Current and Next Generation Quantitative Methods for Raw Poultry
STEVEN RICKE, University of Arkansas, Fayetteville, AR, USA

4:15 Role of Quantitative Data in QMRA to Measure and Improve Process Control during Raw Poultry Production
ERIC EBEL, U.S. Department of Agriculture-FSIS-OPHS, Fort Collins, CO, USA

4:45 Use of Quantitative *Salmonella* Results to Mitigate Public Health Risks Associated with Ground Products
ANGELA SIEMENS, Cargill Meat Solutions, Wichita, KS, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

SF2 Predictive Microbiology and Risk Assessment Software Fair: Spotlight on Case Studies
Room L017
Organizer and Convenor: Mariem Ellouze
Sponsored by International Committee on Predictive Modelling in Food

Developing Food Safety Professionals
HACCP Utilization and Food Safety Systems
Microbial Modelling and Risk Analysis

3:45 p.m. – 5:15 p.m.

Demonstration of FDA-iRisk
YUHUAN CHEN, U.S. Food and Drug Administration–CFSAN, College Park, MD, USA

Demonstration of Combase
MARK TAMPLIN, Centre for Food Safety & Innovation, Tasmanian Institute of Agriculture, University of Tasmania, Hobart, TAS, Australia

Demonstration of MicroHibro
FERNANDO PEREZ-RODRIGUEZ, University of Cordoba, Cordoba, Spain

Demonstration of Gropin
PANAGIOTIS SKANDAMIS, Agricultural University of Athens, Athens, Greece

Demonstration of CB Premium
MARK TAMPLIN, Centre for Food Safety & Innovation, Tasmanian Institute of Agriculture, University of Tasmania, Hobart, TAS, Australia

Demonstration of Sym'previus
FLORENCE POSTOLLEC, ADRIA - UMT ACTIA19.03 ALTER'iX, Quimper, France

Dubai Food Watch Presentation
Room L015

3:45 BOBBY KRISHNA and JEHAINA AL ALI, Dubai Municipality, Dubai, United Arab Emirates

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT14 The Use of Chemicals in Food Hygiene and Linkage to Microbial Resistance
Ballroom C
Organizer and Convenor: Marie-Claude Quentin

Food Hygiene and Sanitation
International Food Protection Issues
Microbial Resistance

3:45 Panelists:

JOHN DONAGHY, Nestec Ltd., Vevey, Switzerland

DONNA GARREN, American Frozen Food Institute, McLean, VA, USA

LARRY KOHL, Retail Business Services LLC, an Ahold Delhaize USA Company, Salisbury, NC, USA

NICOLE RICKER, University of Guelph, Guelph, ON, Canada

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT15 Cottage Foods: Harmonizing Food Safety Practices for a Growing Entrepreneurial Industry
Ballroom D
Organizers: Nicole Arnold, Stephanie Brown, Courtney Crist
Convenor: Courtney Crist

Food Law
Food Safety Education
Low Water Activity Foods.

3:45 Panelists:

ELIZABETH L. ANDRESS, University of Georgia, Athens, GA, USA

ERDOGAN CEYLAN, Mérieux NutriSciences, Crete, IL, USA

ERIC EDMUNDS, The Acheson Group, Boise, ID, USA

JOELL EIFERT, Virginia Tech, Blacksburg, VA, USA

SERENA GIOVINAZZI, Florida Department of Agriculture and Consumer Services, Tallahassee, FL, USA

ABIGAIL SNYDER, The Ohio State University, Columbus, OH, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT16 Has the Time Come for Complete Adoption of the Food Code?
Room M100
Organizers: Ann Marie McNamara, Ben Wagner
Convenor: Ben Wagner

Food Law
Food Safety Assessment, Audit and Inspection
Retail and Foodservice

3:45 Panelists:

VERONICA BRYANT, NC Dept. of Health & Human Services, Raleigh, NC, USA

DARIN DETWILER, Northeastern University, Boston, MA, USA

JASON HORN, In-N-Out Burger, Baldwin Park, CA, USA

GLENDA LEWIS, U.S. Food and Drug Administration, Washington, D.C., USA

ANN MARIE MCNAMARA, Hazel Analytics, Seattle, WA, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

RT17 Finding the Needle in the Cheese Block: How Do We Create Robust Sampling Plans for Dairy Products?
Room M108
Organizer and Convenor: Erin Headley

Applied Laboratory Methods
Dairy Quality and Safety
Low Water Activity Foods

3:45 Panelists:

MARION CASTLE, New Zealand Ministry of Primary Industries, Wellington, New Zealand

TIMOTHY FREIER, Mérieux NutriSciences, Crete, IL, USA

MELINDA HAYMAN, U.S. Food and Drug Association, Washington, D.C., USA

LORALYN LEDENBACH, Kraft Heinz Company, Glenview, IL, USA

MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA

MARCEL ZWIETERING, Wageningen University, Wageningen, The Netherlands

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

T7 Technical Session 7 – Microbial Food Spoilage, Dairy, and Sanitation and Hygiene
Room M105
Convenors: Scott Burnett, Jovana Kovacevic

T7-01 1:30 Validation of Abiotic Bacterial Surrogates for Surface Sanitation in Food Processing Facilities
NICOLE HERBOLD, Adam Idoine, Peter Mattei, Julie Atchley, Sky Johnson, Laurie Clotilde, Quin Chou, Lucia Cerillo, Molly Trump, Antonios Zografos, SafeTraces, Pleasanton, CA, USA

T7-02 1:45 Synergistic Effects of Ultrasound and Natural Antimicrobials Against *Listeria innocua* and *Escherichia coli* K12
HONGCHAO ZHANG, Rohan Tikekar, University of Maryland, College Park, MD, USA

T7-03 2:00 Inactivation of *Listeria* and *E. coli* Using UV-C LED: Effect of Substrate on Inactivation Kinetics
YIFAN CHENG, Hanyu Chen, Luis Sánchez Basurto, Moududul Islam, Vladimir Protasenko, Carmen Moraru, Cornell University, Ithaka, NY, USA

T7-04 2:15 Impact of Co-Culturing with *Pseudomonas aeruginosa* on *Listeria monocytogenes* Biofilm Physiochemical Properties and Sanitizer Tolerance
ERIC MOORMAN, Lee-Ann Jaykus, Department of Food, Bioprocessing, and Nutritional Sciences, North Carolina State University, Raleigh, NC, USA

T7-05 2:30 Impact of Residential Bacteria on Product Quality: The Cold-smoked Salmon Case Study
AURELIEN MAILLET, Agnès Bouju-Albert, Steven Roblin, Pauline Vaissié, Sebastien Leuillet, Xavier Dousset, Emmanuel Jaffrès, Jerome Combrisson, Hervé Prévost, UMR 1014 Secalim, UBL, INRA, Oniris, Nantes, France

T7-06 2:45 Isolation and Serotyping of *Vibrio vulnificus* and *Vibrio cholerae* in Seafood in Korea
YEWON LEE, Sun-Young Park, Heeyoung Lee, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

3:00 Break – Refreshments Available in the Exhibit Hall

TUESDAY PM

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

T7-07 3:45 Evaluation of Commercially Available Protective Cultures to Control *Listeria monocytogenes* and Shiga Toxin-producing *Escherichia coli* in Soft, Surface Mold-ripened Raw Milk Cheese
CATHERINE GENSLER, Dennis D'Amico, University of Connecticut, Department of Animal Science, Storrs, CT, USA

T7-08 4:00 Effect of Commercial Bacterial Fermentates and Protective Cultures on *Listeria monocytogenes* Growth in a Refrigerated Model High-moisture Cheese
SARAH ENGSTROM, Kathleen Glass, Food Research Institute, University of Wisconsin-Madison, Madison, WI, USA

T7-09 4:15 Identification of Key Environmental Sites to Help Small-scale Raw Milk Cheesemakers Improve Sanitation
LISA CAPRERA, Kerry Kaylegian, The Pennsylvania State University, University Park, PA, USA

T7-10 4:30 The Microbial Ecology and Resistome of Raw and Pasteurized Retail Milk
JINXIN LIU, Michele Jay-Russell, Peiman Aminabadi, Yuanting Zhu, Danielle Lemay, David Mills, University of California Davis, Davis, CA, USA

T7-11 4:45 Transcriptome Sequencing of *Listeria monocytogenes* during Co-Cultivation with Cheese Rind Bacteria
JUSTIN ANAST, Stephan Schmitz-Esser, Iowa State University, Ames, IA, USA

T7-12 5:00 Using Machine Learning to Predict Pasteurized Fluid Milk Spoilage Based on Quality Management Practices
SARAH MURPHY, Michael Phillips, Martin Wiedmann, Cornell University, Ithaca, NY, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

T8 Technical Session 8 – Communication, Education and Outreach and Retail and Food Service Safety
Room M109
Convenors: Kristina Barlow, Jennifer Morecraft

T8-01 1:30 Observational Assessment of Food Safety Behaviors at Farmers' Markets in Ontario, Canada
IAN YOUNG, Aeri Chung, Jennifer McWhirter, Andrew Papadopoulos, Ryerson University, Toronto, ON, Canada

T8-02 1:45 A Sequential Mixed Methods Approach in Assessing Consumers' Self-Identified At-home Beef Storage, Handling, and Preparation Knowledge and Behaviors
LILY YANG, Mirah Khalid, Minh Duong, Daniel Gallagher, Tiffany Drape, Robert Williams, Thomas Archibald, Benjamin Chapman, Renee Boyer, Virginia Tech, Blacksburg, VA, USA

T8-03 2:00 Online Professional Training, Consumer Training and Student Training: Symbiosis for Learning Material for Different Target Groups
HEIDY DEN BESTEN, Martine Reij, Leon Gorris, Marcel Zwietering, Wageningen University, Wageningen, The Netherlands

T8-04 2:15 Designing Food Safety Training Using the Integrated Behavior Model
STEPHANIE MAGGIO, North Carolina State University, Raleigh, NC, USA

T8-05 2:30 Food Safety Modernization Act Foreign Supplier Verification Rule: Three Years of Data about the Impact on the United States Food Import Chain Under FDA Jurisdiction
CLAUDIO GALLOTTINI, Franco Rapetti, Andrea Gentili, Ferruccio Marello, Enrica Alberti, Giovanni La Rosa, ITA Corporation, Miami, FL, USA

T8-06 2:45 Building a Competitive Advantage through the Safe Quality Food Certification in Food Manufacturing: Leveraging a Global Food Safety Initiative Scheme
ADENIYI ADEDAYO ODUGBEMI, Wayne Farms LLC, Oakwood, GA, USA

3:00 Break – Refreshments Available in the Exhibit Hall

T8-07 3:45 The Use of Matrix-adapted Bacterial Isolates of *E. coli* O157:H7, *L. monocytogenes*, and *Salmonella* spp. in Validation of High-pressure Treated Juices
CATHERINE ROLFE, Alvin Lee, Nathan Anderson, Glenn Black, Institute for Food Safety and Health, Illinois Institute of Technology, Bedford Park, IL, USA

T8-08 4:00 Effect of Sublethal Food Processing and Associated Environmental Conditions on *Salmonella* Mutation
LEEN BAERT, Johan Gimonet, Coralie Fournier, Caroline Barretto, Bala Jagadeesan, Nestlé Research, Lausanne, Switzerland

T8-09 4:15 Effect of Location and Design of Refrigerated Display Cases on Temperature Control in Retail Stores
ANA MONGE, Angela Shaw, Jeffrey Brecht, Yurui Xie, Scott Steinmaus, Ellen Bornhorst, Yaguang Luo, Bin Zhou, Keith Vorst, Iowa State University, Ames, IA, USA

T8-10 4:30 Evaluation of Cantaloupe Contact Surfaces in Retail Stores
LAURA K. STRAWN, Christopher Rupert, Loretta Friedrich, Benjamin Chapman, Michelle Danyluk, Virginia Tech - Eastern Shore AREC, Painter, VA, USA

T8-11 4:45 Rapid and Synergistic Antimicrobial Processing for Fresh-cut Vegetables in Fast Food Restaurants
XU YANG, Nitin Nitin, University of California-Davis, Davis, CA, USA

T8-12 5:00 Restaurant Food Consumption and Diarrheal Illness: What is the Relationship?
ROBERT SCHARFF, The Ohio State University, Columbus, OH, USA

5:15 p.m. – 6:15 p.m. – Exhibit Hall Reception

EVENING OPTIONS

5:15 p.m. – 6:15 p.m.
Exhibit Hall Reception

6:30 p.m. – 7:30 p.m.
President's Reception (by invitation), *Omni Hotel*

7:00 p.m. – 9:00 p.m.
Student Mixer, *Seelbach Hilton, Rathskeller*

AFFILIATE MEETINGS

5:30 p.m. – 6:30 p.m.
Korea Association for Food Protection Meeting
Room M104

5:30 p.m. – 6:30 p.m.
Southeast Asia Association for Food Protection Meeting, *Room M105*

6:00 p.m. – 7:00 p.m.
Latin America Group Meeting, *Room M107*

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WEDNESDAY

WEDNESDAY, JULY 24

ALL DAY

8:30 a.m. – 3:30 p.m.
Exhibit Hall

Poster Session 3

Beverages and Acid/Acidified Foods	Food Chemical Hazards and Food Allergens
Food Toxicology	Laboratory and Detection Methods
Meat, Poultry and Eggs	Microbial Food Spoilage
Packaging	Seafood
	Water

P3-01 through P3-145 – Authors present 9:00 a.m. – 11:00 a.m.
P3-146 through P3-255 – Authors present 1:00 p.m. – 3:00 p.m.

MORNING

8:30 a.m. – 12:15 p.m.

Ballroom A	S52	Foodborne Disease Outbreak Update
Room M100	S53	The Impact of Packaging Materials on Food Safety: Testing, Modeling and Regulation
Room L015	T9	Technical Session 9 – Meat and Poultry and Seafood
Room M104	T10	Technical Session 10 – Modeling and Risk Assessment

8:30 a.m. – 10:00 a.m.

Ballroom D	S54	Agricultural Water and Emerging Pathogens in the Age of FSMA: Do We Need to Worry?
Ballroom E	S55	Environmental Monitoring – A Cost-effective Tool or Expensive Waste of Resource?
Room M101	S56	Poultry Vaccines: What is Working, What are the Gaps, and What is on the Horizon?
Room M107	S57	Biofilm Removal as a Critical Part of Spoilage and Pathogen Contamination Prevention
Room M105	RT18	Building a National Integrated Food Safety System (IFSS)
Room M108	RT19	Improving Post-mortem Inspection of Beef for Human Health Protection
Room M109	RT20	Application of High-throughput Sequencing by Industry: Potential, Barriers and Opportunities
Room M112	S58	Protecting Probiotics: Detecting Hazards and Confirming Formulation Accuracy

10:00 a.m. – 10:45 a.m. **Break – Refreshments Available in the Poster Session Area**

10:45 a.m. – 12:15 p.m.

Ballroom D	RT21	Food Safety and Trade: Colleagues or Competitors
Ballroom E	S59	Extraintestinal Pathogenic *Escherichia coli* (ExPEC): Urinary Tract Infections, Sepsis, and Avian Colibacillosis
Room M101	S60	A New Paradigm: Cutting Pathogens Off at the Pass by Understanding Their Evolution Dynamics
Room M105	S61	Resurgence of Less Recognized and Presumptive Pathogens: Food Safety Implications
Room M107	S62	Novel and Emerging Technologies for Improving Sanitation
Room M108	RT22	Fresh-cut Processing and FSMA
Room M112	S63	Application of Principles of Failure Mode Effects Analysis (FMEA) for Effective Verification and Implementation of Food Safety Plans

12:00 p.m. – 1:30 p.m. **Lunch Available in the Poster Session Area**

AFTERNOON

1:30 p.m. – 3:30 p.m.

Ballroom A	S64	Attributing Illnesses to Food Sources in the Face of Uncertainty
Ballroom D	S65	Safety of Animal Source Foods in Low- and Middle-income Countries
Ballroom E	S66	Let's Hear from Next Generation Food Safety Scientists on Pathogen Behavior in Ready-to-Eat Foods
Room M100	S67	Antibiotic Reduction, Alternatives, and the Relationship to Food Pathogen Outbreaks
Room M101	S68	Using Food Microbiomes
Room M104	S69	Biofilm and Low-water Activity Foods
Room M107	S70	Polypropylene Permaculture? Microplastics in Terrestrial Agricultural Systems
Room M108	S71	Revolutionary Diagnostic Changes are Shifting the Epidemiological Landscape and Posing Challenges for Outbreak Identification
Room M112	S72	Distribution of Foodborne Pathogens – Geographical Insight from the Use of WGS
Room M105	T11	Technical Session 11 – Low-water Activity Foods, Food Toxicology and Food Defense
Room M109	T12	Technical Session 12 – Molecular Analytics, Genomics and Microbiome and Epidemiology

3:30 p.m. – 4:00 p.m. **Break – Refreshments Available Outside Ballroom A**

4:00 p.m. – 4:45 p.m. **JOHN H. SILLIKER LECTURE**

Ballroom A

From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape

ROBERT V. TAUXE, MD, MPH, Director, Division of Foodborne, Waterborne and Environmental Disease Centers for Disease Control and Prevention Atlanta, Georgia

EVENING OPTIONS

6:00 p.m. – 7:00 p.m. Reception, *Ballroom Foyer*
7:00 p.m. – 10:00 p.m. IAFP Awards Banquet, *Ballroom C*

WEDNESDAY MORNING JULY 24

Posters will be on display 8:30 a.m. – 3:30 p.m.
(See details beginning on page 81)

S52 Foodborne Disease Outbreak Update
Ballroom A
Organizers and Convenors: Kari Irvin, Ewen Todd

Food Hygiene and Sanitation
Fruit and Vegetable Safety and Quality
Seafood Safety and Quality

8:30 *Salmonella* Adelaide in Cut Melon Outbreak
BROOKE WHITNEY, U.S. Food and Drug Administration - Coordinated Outbreak Response and Evaluation Network, College Park, MD, USA

9:00 Multistate Outbreak of *Vibrio parahaemolyticus* Infections Linked to Imported Fresh Crab Meat
JESSICA JONES, U.S. Food and Drug Administration, Gulf Coast Seafood Laboratory, Dauphin Island, AL, USA and PONGPAN LAKSANALAMAI, Maryland Department of Health & Mental Hygiene, Baltimore, MD, USA

9:30 Frozen Corn Source of a *Listeria monocytogenes* Outbreak in Europe
ZSUZSANNA SRÉTERNÉ LANCZ, Food Microbiological National Reference Laboratory, Budapest, Hungary

10:00 Break – Refreshments Available in the Poster Session Area

10:45 Outbreak of *E. coli* O157:H7 and *E. coli* O26 Infections at a Marine Corps Recruit Depot Undercooking by a Contract Supplier
LAURA GIERALTOWSKI, Centers for Disease Control and Prevention, Atlanta, GA, USA

11:15 Multi-State *Salmonella* Outbreak Associated with Frozen Shredded Coconut
EMILY HARVEY, Massachusetts Department of Public Health, Jamaica Plain, MA, USA

11:45 Multistate Outbreak of Shiga Toxin-producing *E. coli* O103 Infections Linked to Ground Beef
LAURA GIERALTOWSKI, Centers for Disease Control and Prevention, Atlanta, GA and DOUG NOVEROSKE, U.S. Department of Agriculture-FSIS, Washington, D.C., USA

12:15 Lunch Available in the Poster Session Area

S53 The Impact of Packaging Materials on Food Safety: Testing, Modeling and Regulation
Room M100
Organizer and Convenor: David Riggs
Sponsored by the IAFP Foundation

Food Chemical Hazards and Food Allergy
Food Packaging

8:30 Analytical Challenges for the Analysis of Contaminants in Food Arising from Packaging Materials
LUKE ACKERMAN, U.S. Food and Drug Administration, College Park, MD, USA

9:00 The Migration of Chemical Additives from Polymeric Food Packaging Materials
MELVIN PASCALL, The Ohio State University, Columbus, OH, USA

9:30 End User Regulatory Considerations for Packaging Changes and New Packaging Compliance
TIMOTHY RASMUSSEN, Abbott, Columbus, OH, USA

10:00 Break – Refreshments Available in the Poster Session Area

10:45 Global Food Contact Analytical Protocols for New Substance Notifications and Final Articles Compliance
NAEEM MADY, Intertek, Boca Raton, FL, USA

11:15 Trends in Food Contact Materials and Chemical Residues Analysis
CHARLES NESLUND, Eurofins, Lancaster, PA, USA

11:45 Risk Assessment of Contaminants from Food Packaging
MAEVE CUSHEN, CremeGlobal, Dublin, Ireland

12:15 Lunch Available in the Poster Session Area

S54 Agricultural Water and Emerging Pathogens in the Age of FSMA: Do We Need to Worry?
Ballroom D
Organizers: Mauricio Durigan, Efstathia Papafragkou, Alexandre da Silva
Convenors: Alexandre da Silva, Efstathia Papafragkou

Applied Laboratory Methods
Viral and Parasitic Foodborne Disease
Water Safety and Quality

8:30 Prevalence of Foodborne Viruses in Irrigation Water
KALI KNIEL, University of Delaware, Newark, DE, USA

9:00 Current Standards for Agricultural Water Quality: Can That Rule Out the Presence of Viruses and/or Parasites?
SOCRATES TRUJILLO, U.S. Food and Drug Administration, College Park, MD, USA

9:30 Efforts from Industry to Improve the Quality of Agricultural Water Related to Parasites
JIM BRENNAN, SmartWash Solutions, LLC, Salinas, CA, USA

10:00 Break – Refreshments Available in the Poster Session Area

S55 Environmental Monitoring – A Cost-effective Tool or Expensive Waste of Resource?
Ballroom E
Organizer: Anett Winkler
Convenor: Loralyn Ledenbach

Food Hygiene and Sanitation
Food Safety Assessment, Audit and Inspection
HACCP Utilization and Food Safety Systems

8:30 Do We Spend the Money on EM Wisely?
ANETT WINKLER, Cargill, Inc., Munich, Germany

9:00 What Can Indicators Tell Us?
ROY BETTS, Campden BRI, Chipping Campden, United Kingdom

9:30 How to Design and Verify Effective Corrective Actions?
RICHARD BROUILLETTE, Commercial Food Sanitation, South Burlington, VT, USA

10:00 Break – Refreshments Available in the Poster Session Area

S56 Poultry Vaccines: What is Working, What are the Gaps, and What is on the Horizon?
Room M101
Organizers and Convenors: Stevie Hretz, Scott Updike

Food Safety Assessment, Audit and Inspection
Pre Harvest Food Safety

8:30 Veterinary Biologics: Regulatory Perspectives at Pre-harvest
CONNIE SCHMELIK-SANDAGE, U.S. Department of Agriculture – APHIS, Ames, IA, USA

9:00 When the Vaccine is Also the Target Pathogen: Lessons Learned
STEVIE HRETZ, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

9:30 Inclusive Targets: Cross-protective Campy Vaccine Using an *E. coli* Vector
CHRISTINE SZYMANSKI, University of Georgia, Athens, GA, USA

10:00 Break – Refreshments Available in the Poster Session Area

S57 Biofilm Removal as a Critical Part of Spoilage and Pathogen Contamination Prevention
Room M107
Organizers: Margarita Gomez, Emilia Rico-Munoz, Abigail Snyder
Convenors: Margarita Gomez, Emilia Rico-Munoz

Beverages and Acid/Acidified Foods
Dairy Quality and Safety
Food Hygiene and Sanitation

8:30 The Role of Biofilm in Spoilage and Pathogen Contamination of Foods and Beverages: Critical Factors for Biofilm Formation, Removal and Verification
ABIGAIL SNYDER, The Ohio State University, Columbus, OH, USA

9:00 Using Enzyme Technology to Eradicate Problems of Biofilms
LAURENT DEHALLE, REALCO, Ottignies-Louvain-la-Neuve, Belgium

9:30 Natural Compounds for the Control of Biofilms on Food Contact Surfaces
CHRISTOPHER MCNAMARA, Ocean Spray Cranberries, Inc., Lakeville-Middleboro, MA, USA

10:00 Break – Refreshments Available in the Poster Session Area

S58 Protecting Probiotics: Detecting Hazards and Confirming Formulation Accuracy
Room M112
Organizers: Andrzej A. Benkowski, Megan S. Brown, J. David Legan
Convenors: Megan S. Brown, J. David Legan
Sponsored by the IAFP Foundation

Dairy Quality and Safety
Pathogen Detection in Probiotic Matrices
Probiotics

8:30 JOSEPHINE D. GREVE-PETERSON, Eurofins Food Integrity & Innovation, Madison, WI, USA

9:00 Detecting Allergens and Contaminants in Probiotic Matrices
SOMSUVRA GHATAK, U.S. Pharma Lab Inc, North Brunswick, NJ, USA

9:30 Protecting Against Mis-Labeling and Adulteration
CARMEN TARTERA, U.S. Food and Drug Administration, CFSAN, Laurel, MD, USA

10:00 Break – Refreshments Available in the Poster Session Area

RT18 Building a National Integrated Food Safety System (IFSS)
Room M105
Organizers: Joseph Corby, Steven Mandernach
Convenor: Steven Mandernach
Sponsored by Association of Food and Drug Officials

Food Safety Assessment, Audit and Inspection
HACCP Utilization and Food Safety Systems
Retail and Foodservice

8:30 Panelists:

BARBARA CASSENS, U.S. FDA, Alameda, CA, USA

JOSEPH CORBY, Association of Food and Drug Officials, New York, NY, USA

BOB EHART, National Association of State Departments of Agriculture, Arlington, VA, USA

ERNEST JULIAN, Rhode Island Department of Health, Providence, RI, USA

STEVE MORIS, Kansas Department of Agriculture, Manhattan, KS, USA

JERRY WOJTALA, International Food Protection Training Institute, Battle Creek, MI, USA

10:00 Break – Refreshments Available in the Poster Session Area

RT19 Improving Post-mortem Inspection of Beef for Human Health Protection
Room M108
Organizers: Ian Jenson, Carl Custer
Convenor: Ian Jenson

Food Law
Meat and Poultry Safety and Quality
Microbial Modelling and Risk Analysis

8:30 Panelists:

MELANIE ABLEY, U.S. Department of Agriculture–FSIS, Springfield, VA, USA

ANDREW POINTON, APFoodIntegrity Pty Ltd, Grange, Australia

MARK RASMUSSEN, Iowa State University, Ames, IA, USA

BETH RIESS, The Pew Charitable Trusts, Washington, D.C., USA

10:00 Break – Refreshments Available in the Poster Session Area

RT20 Application of High-throughput Sequencing by Industry: Potential, Barriers and Opportunities
Room M109
Organizer and Convenor: Behzad Imanian

Communication, Outreach and Education
Food Safety Assessment, Audit and Inspection
Food Safety Culture

8:30 Panelists:

ROBERT BAKER, Mars Global Food Safety Center, Beijing, China

ERIC BROWN, U.S. Food and Drug Administration, Center for Food Safety & Applied Nutrition, College Park, MD, USA

EMILY GRIEP, United Fresh Produce Association, Washington, D.C., USA

SANJAY GUMMALLA, American Frozen Food Institute, McLean, VA, USA

Check the Program Addendum for changes to the Program.

■ – Symposia ■ – Roundtables ■ – Technicals ■ – Developing Scientist Competitor ■ – Topic Areas

BEHZAD IMANIAN, Illinois Institute of Technology, Institute for Food Safety and Health, Bedford Park, IL, USA
FABIEN ROBERT, Nestlé, Dublin, OH, USA

10:00 Break – Refreshments Available in the Poster Session Area

S59 Extraintestinal Pathogenic *Escherichia coli* (ExPEC): Urinary Tract Infections, Sepsis, and Avian Colibacillosis
Ballroom E
Organizers and Convenors: Christopher Sommers, Aixia Xu

Advanced Molecular Analytics
Fruit and Vegetable Safety and Quality
Meat and Poultry Safety and Quality

10:45 The Other Bad *E. coli*: ExPEC
JAMES JOHNSON, University of Minnesota, Minneapolis, MN, USA

11:15 Pandemic Expecs – of Birds and Man
LEE RILEY, University of California, Berkeley, Berkeley, CA, USA

11:45 Treatment Strategies to Provide Broad Protection Against Extra-Intestinal Pathogenic *E. coli*
MELHA MELLATA, Iowa State University, Ames, IA, USA

12:15 Lunch Available in the Poster Session Area

S60 A New Paradigm: Cutting Pathogens Off at the Pass by Understanding Their Evolution Dynamics
Room M101
Organizers: Marc Allard, Pushpinder Kaur Litt, Kali Kniel, Jane VanDoran
Convenors: Pushpinder Kaur Litt, Kali Kniel
Sponsored by the IAFP Foundation

Advanced Molecular Analytics
Applied Laboratory Methods
Microbial Modelling and Risk Analysis

10:45 How Mathematical Modeling Can Identify Factors That Affect Pathogen Survival in Pre-harvest Environments
MANAN SHARMA, U.S. Department of Agriculture – ARS, Environmental Microbial and Food Safety Laboratory, Beltsville, MD, USA

11:15 Genetic Elements Associated with Stress Resistance of Foodborne Pathogens
TERESA BERGHOLZ, North Dakota State University, Fargo, ND, USA

11:45 From WGS to Risk Assessment
FRANCISCO GARCÉS-VEGA, (Independent Consultant), Cali, Columbia

12:15 Lunch Available in the Poster Session Area

S61 Resurgence of Less Recognized and Presumptive Pathogens: Food Safety Implications
Room M105
Organizers: Alvin Lee, Purnendu Vasavada
Convenors: Roy Betts, Alvin Lee
Sponsored by the IAFP Foundation

Applied Laboratory Methods
Fruit and Vegetable Safety and Quality
Meat and Poultry Safety and Quality

10:45 Less Recognized Pathogens and Novel Viruses: An Emerging Threat
PURNENDU VASAVADA, University of Wisconsin-River Falls, River Falls, WI, USA and ALVIN LEE, Institute for Food Safety and Health, Illinois Institute of Technology, Bedford Park, IL, USA

11:15 Hepatitis E and Other Emerging Threats in Europe
ROY BETTS, Campden BRI, Chipping Campden, United Kingdom

11:45 *Cyclospora* and Other Emerging Foodborne Parasites
KEITH LAMPEL, U.S. Food and Drug Administration (*retired*), Laurel, MD, USA

12:15 Lunch Available in the Poster Session Area

S62 Novel and Emerging Technologies for Improving Sanitation
Room M107
Organizers: Shira Kramer, Richard Brouillette, Dale Grinstead
Convenors: Jeffrey Kornacki, Vanessa Cranford

Food Hygiene and Sanitation
Food Safety Education
Retail and Foodservice

10:45 Surface Modification for Cleaning and Microbial Control
JULIE GODDARD, Cornell University, Ithaca, NY, USA

11:15 New Biofilm Control Technology Including Biologics and Synergists
DALE GRINSTEAD, Diversey, Racine, WI, USA

11:45 Digital Analytic Tools for Improved Process Control, New Ways to Train, Drive, and Verify Sanitation Process Compliance
SIMA HUSSEIN, Ecolab Inc., Greensboro, NC, USA

12:15 Lunch Available in the Poster Session Area

S63 Application of Principles of Failure Mode Effects Analysis (FMEA) for Effective Verification and Implementation of Food Safety Plans
Room M112
Organizers: Balasubrahmanyam Kottapalli, Lilia Santiago, Aaron Uesugi
Convenors: Lilia Santiago, Aaron Uesugi

Food Chemical Hazards and Food Allergy
Food Safety Assessment, Audit and Inspection
HACCP Utilization and Food Safety Systems

10:45 Applications of FMEA Principles in Verification and Implementation Food Safety Plans – A Biological Hazard Perspective
BALASUBRAHMANYAM KOTTAPALLI, Conagra Brands, Omaha, NE, USA

11:15 Use of FMEA to Support Prerequisites and Verification Programs – A Chemical/Toxicological Hazard Perspective
LILIA SANTIAGO, Kellogg's, Battle Creek, MI, USA

11:45 Utilization of FMEA in the Development of Food Safety Plans – A Physical Hazard Perspective
AARON UESUGI, Kraft Heinz Company, Glenview, IL, USA

12:15 Lunch Available in the Poster Session Area

RT21 Food Safety and Trade: Colleagues or Competitors
Ballroom D
Organizers: Caroline Smith DeWaal, Robert Tuverson
Convenor: Caroline Smith DeWaal

Food Law
Food Safety Assessment, Audit and Inspection
International Food Protection Issues

10:45 Panelists:

ROGER COOK, New Zealand Ministry for Primary Industries, Wellington, New Zealand

BARBARA KOWALCYK, The Ohio State University, Columbus, OH, USA

MATT MCKNIGHT, U.S. Dairy Export Council, Arlington, VA, USA

DONALD PRATER, U.S. Food and Drug Administration, Silver Spring, MD, USA

12:15 Lunch Available in the Poster Session Area

RT22 Fresh-cut Processing and FSMA
Room M108
Organizer and Convenor: Vanessa Cranford

Fruit and Vegetable Safety and Quality
HACCP Utilization and Food Safety Systems

10:45 Panelists:

SAMIR ASSAR, U.S. Food and Drug Administration, College Park, MD, USA

JIM BRENNAN, SmartWash Solutions, LLC, Salinas, CA, USA

JOHN GURRISI, Fresh Express, Inc., Orlando, FL, USA

DREW MCDONALD, Church Brothers Produce, Salinas, CA, USA

JENNIFER MCENTIRE, United Fresh, Washington, D.C., USA

TREVOR SUSLOW, University of California-Davis, Davis, CA, USA

12:15 Lunch Available in the Poster Session Area

T9 Technical Session 9 - Meat and Poultry and Seafood
Room L015
Convenors: Max Golden, Clint Stevenson

T9-01 8:30 Evaluation of a New Method for the Enumeration of *Campylobacter* from Poultry Associated Matrices
ANTHONY PAVIC, Jeremy Chenu, Sarah Williamson, Wylie Armstrong, Baiada Poultry, Bringelly, NSW, Australia

T9-02 8:45 Prevalence of Top Seven Shiga Toxin-producing *Escherichia coli* in Microbial Populations through Slaughter in Australian Beef Export Abattoirs
SEONG-SAN KANG, Joshua T. Ravensdale, Ranil Coorey, Gary A. Dykes, Robert Barlow, School of Public Health, Curtin University,Bentley, Western Australia, Australia and CSIRO, Agriculture & Food, Brisbane, QLD, Australia

T9-03 9:00 Effect of Dry Aging of Beef on the Survival of *E. coli* O157:H7, *Salmonella* and *Listeria monocytogenes*
VARALAKSHMI SUDAGAR, Els Vossen, Stefaan De Smet, Lieven DeZutter, Ghent University, Ghent, Belgium

T9-04 9:15 Evaluating the Efficacy of Trim Interventions Against High and Low Levels of *Escherichia coli* O157:H7 and Their Impact on Ground Beef Color
JOYJIT SAHA, Ravirajsinh Jadeja, Ranjith Ramanathan, Pabasara Weerarathne, Divya Jaroni, Oklahoma State University, Stillwater, OK, USA

T9-05 9:30 Validation of Immersion Versus Electrostatic Spraying with Commercial Antimicrobials Against Unstressed and Acid-, Starvation-, or Cold-stress Adapted *Campylobacter jejuni* on Broiler Wings, and Related Cost Effectiveness Analysis
CANGLIANG SHEN, Lacey Lemonakis, Ka Wang Li, Wentao Jiang, Xiaoli Etienne, Jeremy Adler, West Virginia University, Morgantown, WV, USA

T9-06 9:45 *Lactobacillus curvatus*: A Natural Food Safety Hurdle for *Listeria monocytogenes* Inhibition on RTE Chicken Strips
Besnik Hidri, Zdenek Cech, Jenny Triplett, VERONIQUE ZULIANI, Chr. Hansen, Arpajon, France

10:00 Break – Refreshments Available in the Poster Session Area

T9-07 10:45 Multispectral Imaging as a Rapid Method to Detect Adulteration of Fresh and Frozen-Thawed Minced Chicken and Pork
Lemonia-Christina Fengou, Alexandra Lianou, Panagiotis Tsakanikas, Efstathios Panagou, GEORGE-JOHN NYCHAS, Agricultural University of Athens, Athens, Greece

T9-08 11:00 Isolation and Characterization of Native Lactic Acid Bacteria Toward Their Selection as Poultry Probiotics
RINE REUBEN, Sharmin Akter, Pravas Roy, Shovon Sarkar, Iqbal Jahid, Department of Science Laboratory Technology, Nasarawa State Polytechnic, Lafia, Lafia, Nigeria

T9-09 11:15 Prevalence and Biofilm Formation of *Staphylococcus aureus* Isolated from Animal Food in Shanghai, China
CHUJUN OU, Fangning Jin, Hang Zhao, Chunlei Shi, Shanghai Jiao Tong University, Shanghai, China

T9-10 11:30 Comparison of Methods for Detection of Total *Vibrionaceae* as an Indicator of Pathogenic *Vibrio* Species in Oysters and Seawater
SALINA PARVEEN, John Jacobs, Gulnihal Ozbay, Karuna Chintapenta, Joan Meredith, Sylvia Ossai, Amanda Abbott, Esam Almuhaideb, Arquette Grant, Kathy Brohawn, Paulinus Chigbu, Gary Richards, University of Maryland Eastern Shore, Princess Anne, MD, USA

T9-11 11:45 Characterization of a Novel Enzyme from *Photobacterium phosphoreum* with Histidine Decarboxylase Activity
KRISTIN BJORNSDOTTIR-BUTLER, Sarah May, Marlee Hayes, Ann Abraham, Ronald A. Benner Jr., U.S. Food and Drug Administration, Gulf Coast Seafood Laboratory, Dauphin Island, AL, USA

T9-12 12:00 Effectiveness of a Novel, Rechargeable, Non-leaching Polycationic *N*-Halamine Antibacterial Coating on *Listeria monocytogenes* Survival in Food Processing Environments
Gerardo Medina, Harshita Chaudhary, Yang Qiu, Yuchen Nan, Argenis Rodas-Gonzalez, Xianqin Yang, CLAUDIA NARVAEZ-BRAVO, University of Manitoba, Winnipeg, MB, Canada

12:15 Lunch Available in the Poster Session Area

T10 Technical Session 10 – Modeling and Risk Assessment

Room M104

Convenors: Travis Chapin, Hao Peng

T10-01 8:30 Development of a User-friendly Software Tool for Validation of Predictive Models
THOMAS OSCAR, U.S. Department of Agriculture-ARS, Princess Anne, MD, USA

T10-02 8:45 Estimation of Growth Cardinal Parameters of *Listeria monocytogenes* by Meta-Regression
URSULA A. GONZALES-BARRON, Beatriz Silva Nunes, Mariem Ellouze, Vasco A. P. Cadavez, Polytechnic Institute of Bragança, Bragança, Portugal

T10-03 9:00 Using Predictive Pre-processing Risk Scores to Reduce Foodborne Disease
TIMOTHY BUISKER, Smart Data Science Solutions, Galena, IL, USA

T10-04 9:15 Risk Categorization of Federally Registered Meat Establishments in Canada Using the Canadian Food Inspection Agency's Establishment-based Risk Assessment Model
Manon Racicot, Alexandre Leroux, Romina Zanabria, Genevieve Comeau, Sunny Ng, Haoran Shi, Raphael Plante, Hargun Chandhok, Suzanne Savoie, ANNA MACKAY, Sylvain Quessy, Canadian Food Inspection Agency, Ottawa, ON, Canada

T10-05 9:30 Food Source Attribution of Shiga Toxin-producing *Escherichia coli* Infection by Meta-Analysis of Case Control Studies
URSULA A. GONZALES-BARRON, Vasco A. P. Cadavez, Anne Thebault, Pauline Kooh, Moez Sanaa, Polytechnic Institute of Bragança, Bragança, Portugal

T10-06 9:45 Food Source Attribution of Human Listeriosis by Meta Analysis of Case Control Studies
VASCO A. P. CADAVEZ, Ursula A. Gonzales-Barron, Anne Thebault, Pauline Kooh, Moez Sanaa, Polytechnic Institute of Bragança, Bragança, Portugal

10:00 Break – Refreshments Available in the Poster Session Area

T10-07 10:45 Predicting the Food Sources of Sporadic Cases of *Listeria* Infection Using Whole Genome Multilocus Sequence Typing
WEIDONG GU, Heather Carleton, LaTonia Richardson, Amanda Conrad, Steven Stroika, Zuzana Kucerova, Beau Bruce, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

T10-08 11:00 Evaluating the Prevalence of *Salmonella* Virulence Gene Expression in Chicken to Incorporate into a Risk Assessment Framework
SHRADDHA KARANTH, Abani Pradhan, University of Maryland, College Park, MD, USA

T10-09 11:15 Stochastic and Dynamic Predictive Modeling Using a Monte Carlo Simulation to Estimate the Behavior and Survival Probability of Bacterial Spores
HIROKI ABE, Kento Koyama, Shinya Doto, Shuso Kawamura, Shige Koseki, Hokkaido University, Sapporo, Japan

T10-10 11:30 Thermal Inactivation of *Salmonella enterica* and Non-pathogenic Bacterial Surrogates in Wheat Flour by Baking in a Household Oven
JIIN JUNG, Kaitlyn E. Casulli, Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA

T10-11 11:45 Dynamics of *Salmonella enterica* and Colloid Transport and Deposition on Polydimethylsiloxane Surfaces of Spinach and Lettuce: The Influence of Surface, Solution, and Particle Characteristics
ANNA JURUSIK, Taozhu Sun, Volha Lazouskaya, Yan Jin, University of Delaware, Newark, DE, USA

T10-12 12:00 Evaluating Uncertainty and Variability Associated with *Toxoplasma gondii* Survival While Cooking and Freezing Fresh Cut Meats
SURABHI RANI, Jitender P. Dubey, Abani Pradhan, University of Maryland, College Park, MD, USA

12:15 Lunch Available in the Poster Session Area

WEDNESDAY AFTERNOON JULY 24

Posters will be on display 8:30 a.m. – 3:00 p.m.
(See details beginning on page 81)

S64 **Attributing Illnesses to Food Sources in the Face of Uncertainty**
Ballroom A
Organizers: Michael Bazaco, Beau Bruce, Joanna Zablotsky Kufel
Convenors: Michael Bazaco, Joanna Zablotsky Kufel

Epidemiology
International Food Protection Issues
Microbial Modelling and Risk Analysis

1:30 Variability and Uncertainty are a Reality; But Decisions Need to be Discrete
MARCEL ZWIETERING, Wageningen University, Wageningen, The Netherlands

2:00 Reviewing Recent Literature for *Campylobacter* Source Attribution
MICHAEL BATZ, U.S. Food and Drug Administration, Silver Spring, MD, USA

2:30 Multi-ingredient Foods and the Point of Contamination: Uncertainties in Analyzing Foodborne Disease Outbreaks
BEAU BRUCE, Centers for Disease Control and Prevention, Atlanta, GA, USA and CARY CHEN PARKER, U.S. Food and Drug Administration, CFSAN, College Park, MD, USA

3:00 Attribution of Diseases to Multiple Transmission Routes Based on Structured Expert Judgment
ARIE HAVELAAR, University of Florida, Gainesville, FL, USA

3:30 Refreshments Available Outside Ballroom A

S65 **Safety of Animal Source Foods in Low- and Middle-income Countries**
Ballroom D
Organizers: Arie Havelaar, Jessie Vipham
Convenors: Jeffrey LeJeune, Jessie Vipham
Sponsored by Feed the Future Innovation Lab for Livestock Systems, University of Florida and the IAFP Foundation

Developing Food Safety Professionals
International Food Protection Issues
Meat and Poultry Safety and Quality

1:30 Global Disease Burden of Pathogens in Animal Source Foods
ARIE HAVELAAR, University of Florida, Gainesville, FL, USA

2:00 Safe Food, Fair Food in South East Asia: Research and Policy
HUNG NGUYEN VIET, ILRI, Hanoi, Vietnam

2:30 Safety of Traditional Dairy Products in East Africa
KEBEDE AMENU, Addis Ababa University, Bishoftu, Ethiopia

3:00 Developing a Risk-based Framework for Food Safety in Low and Middle Income Countries
BARBARA KOWALCYK, The Ohio State University, Columbus, OH, USA

3:30 Refreshments Available Outside Ballroom A

S66 **Let's Hear from Next Generation Food Safety Scientists on Pathogen Behavior in Ready-to-Eat Foods**
Ballroom E
Organizer: Alison Kretser
Convenors: Laurie Post, Edith Wilkin
Sponsored by ILSI North America Food Microbiology Committee

Developing Food Safety Professionals
Low Water Activity Foods
Viral and Parasitic Foodborne Disease

1:30 Survival, Inactivation and Detection of Foodborne Viruses during Long Term Storage in Chocolate, Pistachios and Cornflakes
NEDA NASHERI, Health Canada, Ottawa, ON, Canada

2:00 Survival and Virulence of *L. monocytogenes* during Storage on Low-moisture Foods and Characterization of the Low-moisture Foods' Microbiome
VIVIAN LY, University of Guelph, CRIFS, Guelph, ON, Canada

2:30 Non-traditional Decontamination Methods for *Salmonella* Reduction in Dried Fruits and Cereals
KAYLA MURRAY, University of Guelph, Guelph, ON, Canada

3:00 Identification of Molecular Mechanisms Mediating Long-term Survival of *Salmonella* in Pistachios, Dried Apples, and Cornflakes
VICTOR JAYEOLA, North Carolina State University, Raleigh, NC, USA

3:30 Refreshments Available Outside Ballroom A

S67 **Antibiotic Reduction, Alternatives, and the Relationship to Food Pathogen Outbreaks**
Room M100
Organizers: Jessica Meisinger, Rodrigo Santibanez
Convenors: Bassam A. Annous, Rodrigo Santibanez
Sponsored by Merck Animal Health

Antibiotic Reduction and Alternatives
Food Safety Education
Pre-harvest Food Safety

1:30 How Antibiotic Alternatives Could Address Food Safety Concerns in Pre-harvest Stages
WILLIAM CHANEY, Diamond V, Cedar Rapids, IA, USA

2:00 Areas of Concern When Reducing and/or Eliminating the Use of Antibiotics
SCOTT GUSTIN, Tyson Foods, Springdale, AR, USA

2:30 Best Alternatives to Mitigate Issues That Antibiotic Reduction Could Heighten (Global Perspective)
LINNEA NEWMAN, Merck Animal Health, Madison, NJ, USA

3:00 Food Safety Concerns Due to Antibiotic Reduction–How Have Countries That Have Pioneered in This Area Such as the United Kingdom Address These Issues?
RICHARD GRIFFITHS, UK Poultry Association, London, United Kingdom

3:30 Refreshments Available Outside Ballroom A

S68 **Using Food Microbiomes**
Room M101
Organizers: Douglas Marshall, Gregory Siragusa
Convenor: Gregory Siragusa

Advanced Molecular Analytics
Applied Laboratory Methods
Probiotic Analysis

1:30 Tracking Antibiotic Resistance Genes in the Environment
NUR HASAN, CosmosID, Rockville, MD, USA

2:00 Understanding the Microbial Communities of Water
MENU LEDDY, Orange County Water Board, Orange City, CA, USA

2:30 Sewage Microbiomes as Bellwethers of Foodborne Diseases
LAWRENCE GOODRIDGE, University of Guelph, Guelph, ON, Canada

3:00 What's in Your Tool Kit? Case Studies of Microbiomes for Food Microbiologists
GREGORY SIRAGUSA, Eurofins Microbiology, New Berlin, WI, USA

3:30 Refreshments Available Outside Ballroom A

S69 **Biofilm and Low-water Activity Foods**
Room M104
Organizers: Vanessa Cranford, Dale Grinstead, Shira Kramer, Michele Sayles
Convenors: Dale Grinstead, Shira Kramer

Dairy Quality and Safety
Food Hygiene and Sanitation
Low Water Activity Foods

1:30 What are Dry Biofilms, and How Do They Survive in Low Moisture or Dry Environments?
DIANE WALKER, MSU Center for Biofilm Engineering, Bozeman, MT, USA

2:00 Beware Biofilm! Are Dry Surface Biofilms in Healthcare Settings Applicable in the Food Industry?
KATARZYNA LEDWOCH, Cardiff University, Cardiff, United Kingdom

2:30 Biofilm in a Dry Environment Industry Case Study
KARL THORSON, General Mills, Minneapolis, MN, USA

3:00 Biofilm Formation and Decontamination of Pressure-stressed and Wild-type *Cronobacter sakazakii, Listeria monocytogenes* and Shiga Toxin-producing *Escherichia coli*
ALIYAR FOULADKHAH, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

3:30 Refreshments Available Outside Ballroom A

S70 **Polypropylene Permaculture? Microplastics in Terrestrial Agricultural Systems**
Room M107
Organizers and Convenors: Sarah Allard, Angela Marie C. Ferelli
Sponsored by the IAFP Foundation

Food Chemical Hazards and Food Allergy
Fruit and Vegetable Safety and Quality
Water Safety and Quality

1:30 Microplastics in the Terrestrial Food Chain: The Case of Plastics in Chicken
ESPERANZA HUERTA LWANGA, El Colegio de la Frontera Sur/Wageningen University and Research, Campeche, Mexico

2:00 Potential of Microplastic Transport through Surface Water Irrigation and Biosolids Application
SHANNON BARTELT-HUNT, University of Nebraska-Lincoln, Omaha, NE, USA

2:30 Biodegradeable Plastics in Soils: Solution or Pollution?
MARION BRODHAGEN, Western Washington University, Bellingham, WA, USA

3:00 Panel Discussion

3:30 Refreshments Available Outside Ballroom A

S71 **Revolutionary Diagnostic Changes are Shifting the Epidemiological Landscape and Posing Challenges for Outbreak Identification**
Room M108
Organizers and Convenors: Francisco Diez-Gonzalez, Shari Shea
Sponsored by University of Georgia, Center for Food Safety and the IAFP Foundation

Advanced Molecular Analytics
Applied Laboratory Methods
Epidemiology

1:30 From Petri Dishes to Multiplex PCR Panels: The Modernization Age of the Clinical Laboratory
MELISSA MILLER, University of North Carolina, Chapel Hill, NC, USA

2:00 The Tidal Wave Affecting FoodNet Incidence and the Sinking Outbreak Detection Power
HEATHER CARLETON, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

2:30 Closing the Transitional Gap: From Reflux Cultures to Emerging Metagenomics
ROBYN ATKINSON-DUNN, State Laboratory, Salt Lake City, UT, USA

3:00 Why Should the Food Industry Care about CIDT?
MICHAEL ROBERSON, Publix Super Markets, Inc., Lakeland, FL, USA

3:30 Refreshments Available Outside Ballroom A

S72 **Distribution of Foodborne Pathogens – Geographical Insight from the Use of WGS**
Room M112
Organizer: Peter Ben Embarek
Convenors: Peter Ben Embarek, Eric Stevens

Advanced Molecular Analytics
International Food Protection Issues
Whole Genome Sequencing

1:30 Trials and Tribulations of Using WGS to Predict Pathogen Sources: Insights from WGS of *Listeria* and *Salmonella*
MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA

2:00 Location, Location, Location: Using WGS to Tease Apart Where a Foodborne Outbreak Occurred
HEATHER CARLETON, Centers for Disease Control and Prevention, Atlanta, GA, USA

2:30 How the Genetic Information from Food Sample Isolates Have Informed the Source of an Outbreak
MARC ALLARD, U.S. Food and Drug Administration, Center for Food Safety & Applied Nutrition, College Park, MD, USA

3:00 Panel Discussion

3:30 Refreshments Available Outside Ballroom A

T11 **Technical Session 11 – Low-water Activity Foods, Food Toxicology and Food Defense**
Room M105
Convenors: Pablo Alvarez, Nathan Mirdamadi

T11-01 1:30 Desiccation in Oil Protects Bacteria in Thermal Processing
REN YANG, Yucen Xie, Jie Xu, Juming Tang, Washington State University, Pullman, WA, USA

T11-02 1:45 Key Factors Influencing Thermal Resistance of Bacterial Pathogens in Low-moisture Foods
REN YANG, Juming Tang, Washington State University, Pullman, WA, USA

T11-03 2:00 Decontamination of *Salmonella enterica* in Low-moisture Foods by Cold Atmospheric Plasma
CLAUDIA DIAZ, Carlos Somoza, Chris Timmons, Kedar Pai, Li Ma, National Institute for Microbial Forensics & Food and Agricultural Biosecurity, Oklahoma State University, Stillwater, OK, USA

T11-04 2:15 Microbiological Profile, Incidence and Behavior of *Salmonella* in Seeds Commercialized in Mexican Markets
CRISTIAN JUÁREZ-ARANA, Montserrat Hernández-Iturriaga, Universidad Autónoma de Querétaro, Querétaro, QA, Mexico

T11-05 2:30 Survival of *Salmonella* and Surrogate Microorganisms in Whole Wheat and All Purpose Flour during Long-term Storage
JIIN JUNG, Matthew Igo, Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA

T11-06 2:45 Studies of Aflatoxin Production by *Aspergillus flavus* and *Aspergillus parasiticus* on Ground Flax Seeds
DAWIT GIZACHEW, Chih-Hsuan Chang, W.T. Evert Ting, Purdue University Northwest, Department of Chemistry and Physics, Hammond, IN, USA

T11-07 3:00 Influence of the Germination Time on Aflatoxins Production during Malting of Wheat for Use in Craft Beer
DANIELI C. SCHABO, Janeeyre F. Maciel, Beatriz T. Lamanaka, Marta H. Taniwaki, Donald W. Schaffner, Marciane Magnani, Federal Institute of Education, Science and Technology of Rondonia, Colorado do Oeste, Brazil

T11-08 3:15 Rapid Identification of Lineage Types and Phylogenetic Relationships of *Clostridium botulinum* Strains by Whole Genome Sequencing
NARJOL GONZALEZ-ESCALONA, Nagarajan Thirunavukkarasu, Travis Wentz, Eric Brown, Thomas Hammack, Shashi Sharma, U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, College Park, MD, USA

3:30 Refreshments Available Outside Ballroom A

T12 **Technical Session 12 – Molecular Analytics, Genomics and Microbiome and Epidemiology**
Room M109
Convenors: Kerry Cooper, Kieran Jordan

T12-01 1:30 Maternal Dietary Risk Factors for Neural Tube Defects in Guatemala
Olga Torres, Jorge Matute, Ronald Riley, Vanessa Apodaca, Joyce Rudy, BARBARA KOWALCYK, The Ohio State University, Columbus, OH, USA

T12-02 1:45 A Summary of Foodborne Illness Outbreaks Investigated by FDA's Coordinated Outbreak Response and Evaluation Network from January 2011 to December 2018
SHEILA PACK MERRIWEATHER, Tami Craig Cloyd, Marianne Fatica, Kevin Garner, Cerise Hardy, Donald Obenhuber, Sabina Reilly, U.S. Food and Drug Administration, CFSAN, Coordinated Outbreak Response and Evaluation Network, College Park, MD, USA

T12-03 2:00 When Unregulated Food Sales Go Wrong: *Clostridium perfringens* from a Church Fundraiser in North Carolina
VERONICA BRYANT, Nicole Lee, Tammra Morrison, Benjamin Chapman, NC Dept. of Health & Human Services, Raleigh, NC, USA

T12-04 2:15 Impact of Prospective Whole Genome Sequencing on Multi-jurisdictional *Salmonella* Outbreaks Associated with Frozen Raw Breaded Chicken Products in Canada
YUHUI XU, Tanis Kershaw, Rachel McCormick, Rima Kandar, Ashley Kerr, Lorelee Tschetter, Kelvin Chau, Rita Finley, Mythri Viswanathan, Public Health Agency of Canada, Outbreak Management Division, Centre for Foodborne, Environmental and Zoonotic Infectious Diseases, Ottawa, ON, Canada

T12-05 2:30 Presence and Identification of *Campylobacter* spp. in East Tennessee Rivers
MOLLY WEST, Jennifer Richards, Faith Critzer, The University of Tennessee, Knoxville, TN, USA

T12-06 2:45 Fate of Antibiotic Resistance in the Environment: From Beef Cattle Production through Manure Storage and Land Application
ECE BULUT, Darshan Baral, Xu Li, Galen Erickson, Amy Schmidt, John Schmidt, Bing Wang, University of Nebraska-Lincoln, Lincoln, NE, USA

T12-07 3:00 The Fecal Resistome of Dairy Cattle is Associated with Diet during Nursing and Weaning
JINXIN LIU, David Mills, University of California Davis, Davis, CA, USA

T12-08 3:15 Viability-linked Metagenomic Analysis of the Disposable Glove Microbiome
BARRY MICHAELS, Jenna Brooks, Katherine Sandoval, Stephen Ardagh, B. Michaels Group Inc., Palatka, FL, USA

3:30 Refreshments Available Outside Ballroom A

4:00 p.m. – 4:45 p.m. **JOHN H. SILLIKER LECTURE**
Ballroom A

From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape
ROBERT V. TAUXE, MD, MPH, Director, Division of Foodborne, Waterborne, and Environmental Disease Centers for Disease Control and Prevention Atlanta, Georgia, USA

EVENING OPTIONS

6:00 p.m. – 7:00 p.m.
IAFP Awards Banquet Reception, *Ballroom Foyer*

7:00 p.m. – 9:30 p.m.
IAFP Awards Banquet, *Ballroom C*

JOHN H. SILLIKER LECTURE

Wednesday, July 24
Closing Session
4:00 p.m. – 4:45 p.m.

From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape

Robert V. Tauxe, MD, MPH
Director
Division of Foodborne, Waterborne and Environmental Diseases
Centers for Disease Control and Prevention
Atlanta, Georgia, USA

Robert V. Tauxe, MD, MPH, is Director of the Division of Foodborne, Waterborne and Environmental Diseases for the National Center for Emerging and Zoonotic Infectious Diseases at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia.

Within the Division, Dr. Tauxe oversees the prevention and control of foodborne, waterborne and fungal infections, monitoring the frequency of these infections in the U.S.; investigates outbreaks; and develops strategies to reduce the disease, disability and deaths they cause.

Dr. Tauxe's interests include bacterial enteric diseases; epidemiology and pathogenesis of infectious diseases; epidemiologic and clinical consequences of bacterial genetic exchange; antimicrobial use and resistance to antimicrobial agents; and teaching epidemiologic methods.

Dr. Tauxe graduated from Yale University and received his M.D. from Vanderbilt Medical School. He completed an internal medicine residency, trained at the CDC in the Epidemic Intelligence Service, and joined its staff in 1985. His faculty appointments include the School of Public Health and the Department of Biology at Emory University in Atlanta.

Dr. Tauxe has authored/co-authored 254 journal articles, letters and book chapters. He has been an IAFP Member since 2010.

JOHN H. SILLIKER ABSTRACT

From Outbreak Catastrophes to Clades of Concern, How Whole Genome Sequencing Can Change the Food Safety Landscape

Robert V. Tauxe, MD, MPH

Director, Division of Foodborne, Waterborne and Environmental Diseases
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention
Atlanta, Georgia, USA

Public health plays an important role in food safety. In the changing landscape of foods, tastes and processes, pathogens can find a niche, persist and emerge. Public health surveillance and investigations can identify problems and help target solutions to prevent foodborne illnesses. The tools public health uses for surveillance have also been evolving. Better microbiological methods improve definition of individual strains, separating "signal" from "noise." These improvements mean finding more outbreaks, helping to drive immediate control efforts and longer term prevention policies.

The transition to whole genome sequencing is now underway in our public health surveillance network PulseNet. These new tools already provide better strain resolution and new ways of looking at food safety problems. Whole genome sequencing differs in several important ways from the standard PFGE subtyping PulseNet used for the past 23 years. Resolving differences down to single nucleotides provides a scale of similarity that can be as precise as needed. From sequence, other strain characteristics can be predicted including serotype, antibiotic-resistance profile, and virulence. This is changing the workflow in our public health labs, so more characteristics are known when a cluster of related infections is detected. Unlike the previous closed PFGE database of PulseNet, the sequence database is open access. As public health scientists and partners at FDA and USDA will add ~60,000 bacterial sequences a year, the database will be a rich source for future research.

We anticipate that as sequencing is applied to surveillance, investigation of the many smaller outbreaks detected should find more specific control points and guide prevention, including harborage in processing, reservoirs in production and new sources from other countries. As we find even smaller outbreaks, the line blurs between traditional outbreaks and the background of individual "sporadic" cases.

Beyond the traditional role of helping public health find and stop outbreaks, this new surveillance system can do much more to prevent illnesses.

- We can more easily track "clades of concern," investigating them even in the absence of an outbreak. For example, we can track strains with greater confidence that caused major repeated outbreaks in the past, are still present at lower incidence now, and could yet cause future outbreaks. We can see other strains that emerge, increase over time, and may be investigated and controlled before they cause a large traditional outbreak, preventing more foodborne infections.
- Other countries are rapidly adopting similar surveillance strategies. Canada, the European Union, and Australia are in the vanguard with the U.S., and many more are starting soon. By comparing sequences across borders, all can better understand the spread of pathogens through travel and trade.
- As tools for interpreting sequences become more accessible, many in food science will find tracking specific strains useful to examine the ecology of bacterial pathogens in food production and processing. By comparing them with strains in the public database, internal control efforts can be focused.
- It will be possible to use more genetic markers for virulence, persistence, or adaptation to specific reservoirs and hosts. The potential to understand better the biology of these bacteria is growing rapidly.
- The next transition, building on sequencing experience, will someday bypass traditional culture and go directly to metagenomic analyses to construct genomes directly from specimens. We stand at a threshold in microbial food safety, with the opportunity to accelerate research, investigation and prevention. I hope to learn and relearn much more, together with all of you.

NOTES

POSTER

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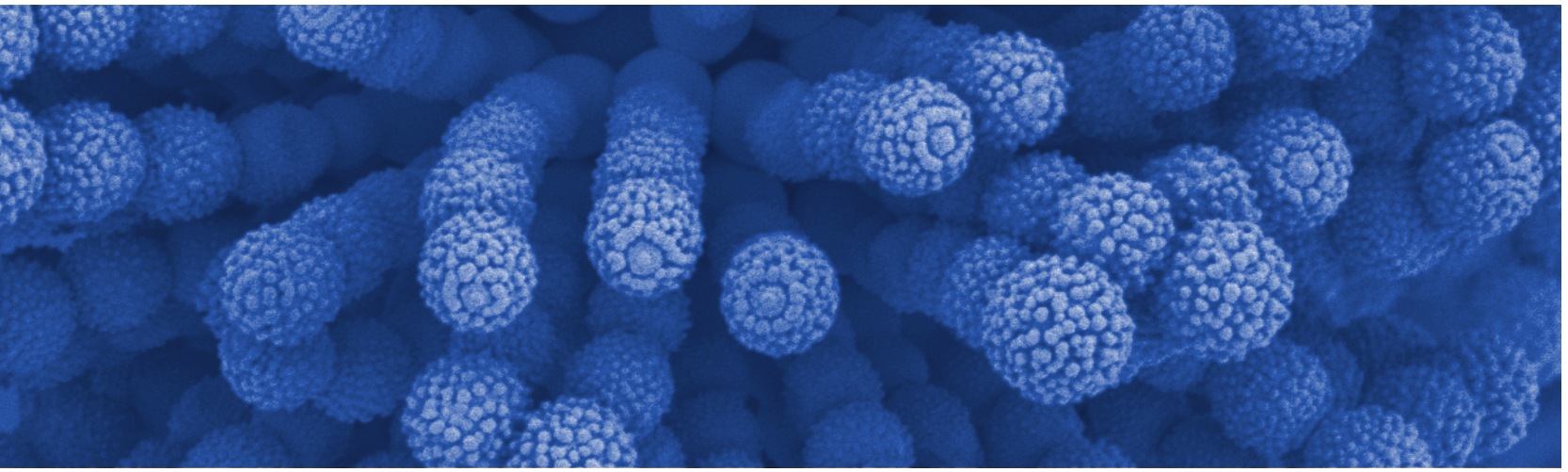

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POSTER SESSIONS

Located in the Exhibit Hall

POSTER SESSION 1

MONDAY, JULY 22 • 8:30 a.m. – 6:15 p.m.

Communication Outreach and Education
Epidemiology
Food Defense
Food Law and Regulation
Food Processing Technologies
Food Safety Systems
General Microbiology
Low-water Activity Foods
Modeling and Risk Assessment
Molecular Analytics, Genomics and Microbiome
Retail and Food Service Safety

P1-01 through P1-123 – Authors present 10:00 a.m. – 11:30 a.m. and 5:15 p.m. – 6:15 p.m.
P1-124 through P1-281 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m.

POSTER SESSION 2

TUESDAY, JULY 23 • 8:30 a.m. – 6:15 p.m.

Antimicrobials
Dairy
Pre-harvest Food Safety
Produce
Sanitation and Hygiene
Viruses and Parasites

P2-01 through P2-141 – Authors present 10:00 a.m. – 11:30 a.m. and 5:15 p.m. – 6:15 p.m.
P2-142 through P2-262 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m

POSTER SESSION 3

WEDNESDAY, JULY 24 • 8:30 a.m. – 3:30 p.m.

Beverages and Acid/Acidified Foods
Food Chemical Hazards and Food Allergens
Food Toxicology
Laboratory and Detection Methods
Meat, Poultry and Eggs
Microbial Food Spoilage
Packaging
Seafood
Water

P3-01 through P3-145 – Authors present 9:00 a.m. – 11:00 a.m.
P3-146 through P3-255 – Authors present 1:00 p.m. – 3:00 p.m.

POSTERS

MONDAY POSTERS
8:30 AM – 6:15 PM

P1 POSTER SESSION 1

Communication Outreach and Education
Epidemiology
Food Defense
Food Law and Regulation
Food Processing Technologies
Food Safety Systems
General Microbiology
Low-water Activity Foods
Modeling and Risk Assessment
Molecular Analytics, Genomics and Microbiome
Retail and Food Service Safety

Kentucky International Convention Center, Exhibit Hall

P1-01 through P1-123 – Authors present 10:00 a.m.– 11:30 a.m. and 5:15 p.m. – 6:15 p.m.

P1-124 through P1-281 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m.

Retail and Food Service Safety

P1-01 Sterilization of Food Contact Surfaces Using Chlorine Disinfectants to Control Planktonic Cells and Biofilms of *Salmonella* spp. — KYUNG WON NA, Kye-Hwan Byun, Jin Hee Kim, Angela Ha, Ji-Young Lee, Sang-Do Ha, Advanced Food Safety Research Group, Brain Korea 21 Plus, Chung-Ang University, Ansung, South Korea

P1-02 Validation of the Rapidchek Select *Salmonella* Test Method for the Detection of *Salmonella* species on 12" by 12" Stainless Steel Environmental Surfaces — Lois Fleck, MEREDITH SUTZKO, Romer Labs, Inc., Newark, DE, USA

P1-03 One Mississippi, Two Mississippi: Phylogenetic Analysis Supports That *Salmonella enterica* subsp. *enterica* Serovar Mississippi is Polyphyletic — RACHEL CHENG, Martin Wiedmann, Cornell University, Ithaca, NY, USA

P1-04 Heat Inactivation of *Listeria monocytogenes* on Pecans, Macadamia Nuts, and Sunflower Seeds — MEGHAN DEN BAKKER, Francisco Diez-Gonzalez, Research Specialist, Griffin, GA, USA

P1-05 Culture Supernatants of *Lactobacillus plantarum* Reduces Sporulation, and Biofilm Formation, of *Clostridium perfringens* by Downregulating Transcription of Agr-like Quorum Sensing Genes — ALBERTO AGUAYO-ACOSTA, Eduardo Franco, Angel Merino, Jorge Dávila-Aviña, Jorge Vidal, Norma Heredia, Santos Garcia, Departamento de Microbiología e Inmunología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, San Nicolas, Mexico

P1-06 A Pilot Study Evaluating Oxford Nanopore Sequencing Technology for *Salmonella* Serotype Prediction — FENG XU, Silin Tang, Chongtao Ge, Hao Luo, Guangtao Zhang, Robert Baker, Martin Wiedmann, Xiangyu Deng, Mars Global Food Safety Center, Beijing, China

P1-07 *Enterococcus faecium* NRRL B-2354 as a *Salmonella* Surrogate in Validating Thermal Treatment of Dairy Powders with Different Lactose and Milk Protein Compositions — NURUL HAWA AHMAD, Elliot Ryser, Bradley Marks, Michigan State University, East Lansing, MI, USA

P1-08 Investigation of Relationship between Desiccation Tolerance of *Salmonella* spp. and Glass Transition Temperature — KYEONG-MIN LEE, Masaki Shoda, Kiyoshi Kawai, Shige Koseki, Hokkaido University, Sapporo, Japan

P1-09 Performance of an Improved Thermal Death Time Sandwich System for Determining the Thermal Death Kinetics of *Salmonella* — SOON KIAT LAU, Xinyao Wei, Jeyamkondan Subbiah, University of Nebraska-Lincoln, Lincoln, NE, USA

P1-10 Whole Genome Sequencing Analysis for Top Seven Shiga Toxin-producing *Escherichia coli* — JIAOJIE ZHENG, Xuwen Wieneke, Sarita Raengpradub Wheeler, Timothy Freier, Mérieux NutriSciences, Crete, IL, USA

P1-11 A Whole Genome Sequence Workflow for Characterization of Shiga Toxin-producing *Escherichia coli* Using Bionumerics — REBECCA LINDSEY, Peyton Smith, Morgan Schroeder, Sung Im, Hannes Pouseele, Nancy Strockbine, Heather Carleton, Centers for Disease Control and Prevention, Atlanta, GA, USA

P1-12 The Relationship between Inactivation and Morphological Damage of *Aspergillus flavus* Treated by High Hydrostatic Pressure — Bang-Yuan Chen, Yun-Ting Hsiao, CHUNG-YI WANG, National Formosa University, Yunlin, Taiwan

P1-13 Influence of Asymptomatic *Escherichia coli* Inhabiting the Gut on Inflammation, Cell Proliferation, Oxidative Stress, and Angiogenesis in the Intestine — JEEYEON LEE, Woori Kim, Yoonjeong Yoo, Kyoung-Hee Choi, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-14 Sporulation of Planktonic and Sessile *Clostridium perfringens* in Response to Chemical and Oxidative Stress — WENSI HU, Ok Kyung Koo, Da Min Nam, Gyeongsang National University, Jinju, South Korea

P1-15 Use of Water Activity vs. Moisture Content in Response Surface Models for Predicting Microbial Lethality during Extrusion of Low-moisture Foods — TUSHAR VERMA, Jeyamkondan Subbiah, University of Nebraska-Lincoln, Lincoln, NE, USA

P1-16 Thermal Inactivation of *Salmonella* Enteritidis PT 30 and *Enterococcus faecium* in Egg Powders at Different Water Activities — MARCO ESTEBAN PEREZ REYES, Jie Xu, Meijun Zhu, Juming Tang, Gustavo Victor Barbosa Cánovas, Washington State University, Pullman, WA, USA

P1-17 Assessing Efficacy of Vacuum-assisted, Low-temperature Steam Decontamination of *Salmonella* spp., *Listeria monocytogenes*, Shiga Toxin-producing *Escherichia coli*, and a Surrogate (*Pediococcus acidilactici*) on Raisins — JENNIFER ACUFF, Jian Wu, Claire M. Marik, Michael Hughes, Daniel Gallagher, Monica Ponder, Virginia Tech, Blacksburg, VA, USA

P1-18 Inactivation of *Salmonella enterica* and *Enterococcus faecium* in Cumin Seeds Using Gaseous Ethylene Oxide — LONG CHEN, Xinyao Wei, Soon Kiat Lau, Jeyamkondan Subbiah, University of Nebraska-Lincoln, Lincoln, NE, USA

P1-19 The Prevalence and Characteristics of Acid-resistant *E. coli* in Foodborne and Clinical Isolates in Korea — SOO HWAN SUH, Myeongkyo Jeong, Gun Woo Nam, Eun Jeong Heo, Sa Hyun Hong, Byung Hak Kang, Mi-Gyeong Kim, Hyo-Sun Kwak, Ministry of Food and Drug Safety, Cheongju, South Korea

P1-20 Comparison of Biofilm Components and Resistance of Biofilm-forming *Staphylococcus aureus* at Different Biofilm Formation Temperatures — SOOHWAN KIM, Woo-ju KIM, Dong-Hyun Kang, Seoul National University, Seoul, South Korea

P1-21 Withdrawn

P1-22 Ethylene Oxide Fumigation for Inactivation of *Salmonella* and *Enterococcus faecium* NRRL B-2354 in Black Pepper — XINYAO WEI, Long Chen, Soon Kiat Lau, Harshavardhan Thippareddi, Jeyamkondan Subbiah, University of Nebraska-Lincoln, Lincoln, NE, USA

P1-23 Behavior of Shiga Toxin-producing *Escherichia coli, Salmonella* spp., and *Listeria monocytogenes* on Dried Apricots Made with and without Sulfur Dioxide — Zhuosheng Liu, Chao Liao, LUXIN WANG, University of California Davis, Davis, CA, USA

Blue Text – Developing Scientist Competitor Green Text - Undergraduate Student Competitor

P1-24 Inactivation of *Salmonella* Typhimurium during Red Chile Drying — WAYNE SALAZAR, Willis Fedio, New Mexico State University, Las Cruces, NM, USA

P1-25 A Non-Ionizing Radiation Method (UV-C) to Control *Aspergillus flavus* and *Aspergillus parasticus* on Roasted Coffee Beans — KYE-HWAN BYUN, Md. Furkanur Rahaman Mizan, Shamsun Nahar, Hyun-Jung Joo, Kyung Won Na, Sang-Do Ha, Advanced Food Safety Research Group, Brain Korea 21 Plus, Chung-Ang University, Ansung, South Korea

P1-26 Inactivation of *Salmonella* and Surrogate Bacteria on Brazil Nuts and Pine Nuts Exposed to Commercial Propylene Oxide Processing Conditions — JIAN WU, Monica Ponder, Jennifer Acuff, Kim Waterman, Virginia Tech, Blacksburg, VA, USA

P1-27 Study of *Listeria monocytogenes* in Turkey Meat Samples from Independent, Urban Delis Provides a Critical Triangulation Point for a Multistate Outbreak Investigation — Sana Mujahid, JAMES ROGERS, Consumer Reports, Yonkers, NY, USA

P1-28 Comparison of Food Establishment Characteristics between Viral and Bacterial-caused Foodborne Outbreaks Reported to the National Environmental Assessment Reporting System — ADAM KRAMER, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

P1-29 Determining the Perceived Cost of Implementing a Vomit Clean-up Plan — ANGELA FRASER, Kathryn Boys, Clemson University, Clemson, SC, USA

P1-30 Perceived Benefits and Barriers to Implementation of a Traceability System in School Foodservice Establishments in North Carolina, South Carolina and Georgia — ANGELA FRASER, Kathryn Boys, Clemson University, Clemson, SC, USA

P1-31 Characterization of *Escherichia coli* O157:H7 Stationary Phase Acid Resistance and Survival in a Model Vegetable Fermentation System — Clara M. Jones, FRED BREIDT, U.S. Department of Agriculture–ARS, Raleigh, NC, USA

P1-32 A Buffer Capacity Model for Predicting pH Changes Due to Addition of Low Acid Ingredients in Acid Foods — Madyson Longtin, Robert Price, Suzanne Johanningsmeier, Summer Payton, Don Bitzer, FRED BREIDT, U.S. Department of Agriculture–ARS, Raleigh, NC, USA

P1-33 The Ability of Collection Solutions to Maintain the Viability of *Listeria monocytogenes* after Sampling Inoculated Stainless Steel Surfaces — GEOFF BRIGHT, Nerie Roa, N. Robert Ward, World Bioproducts, Bothell, WA, USA

P1-34 Survival and Growth of *Arcobacter* spp. in Human Consumption Water at Different Temperatures — MARIA LAURA ARIAS, Ana Laura Rodriguez, University of Costa Rica, San José, Costa Rica

P1-35 Evaluating the Impact of Cooling Techniques on *Escherichia coli* Populations in Taco Meat — Lindsay Beardall, Paola Paez, Randall Phebus, Tracee Watkins, SARA GRAGG, Kansas State University, Manhattan, KS, USA

P1-36 Strengthening Food Safety Provisions on Cruise Ships: The Vessel Sanitation Program Cooperative Revision Model — LUIS O. RODRIGUEZ, Centers for Disease Control and Prevention (CDC), Fort Lauderdale, FL, USA

P1-37 Predictive Modeling of the Effect of ε-Polylysine Hydrochloride on Growth and Thermal Inactivation of *Listeria monocytogenes* in Fish Balls — ZHEN JIA, Changcheng Li, Ting Fang, Jinquan Chen, Fujian Agriculture and Forestry University, Fujian, China

P1-38 The Evaluation of Facilities and Hygiene Prerequisites within the National School Nutrition Programme in South African Schools — JUGEN M MANYATSA, Mangosuthu University of Technology, Durban, South Africa

P1-39 Implementation of Novel Technology and Its Implications for a Food Safety Culture in University Dining Halls — SAVANA EVERHART, Eric Moore, Lee-Ann Jaykus, Benjamin Chapman, North Carolina State University, Raleigh, NC, USA

P1-40 Characterization of *Salmonella enterica* Isolates from Selected United States Swine Feed Mills by Whole-genome Sequencing — GABRIELA MAGOSSI, Valentina Trinetta, Kansas State University, Food Science Institute, Manhattan, KS, USA

Epidemiology

P1-41 Prevalence of *Salmonella* and *Escherichia coli* in Selected United States Swine Feed Mills and Assessment of Potential Contamination Risk Factors — GABRIELA MAGOSSI, Cassandra Jones, T G Nagaraja, Randall Phebus, Jason Woodworth, Elisabetta Lambertini, Valentina Trinetta, Kansas State University, Food Science Institute, Manhattan, KS, USA

P1-42 Knowledge Discovery from Epidemiological Data for Assisting Foodborne Outbreak Investigation — DANDAN TAO, Hao Feng, University of Illinois at Urbana-Champaign, Urbana, IL, USA

P1-43 Scoping Review of Chronic Sequelae Associated with Common Foodborne Illnesses — KRISTEN POGREBA-BROWN, Erika Austhof, Alexandra Armstrong, Kenzie Schaefer, Lorenzo Villa, Ama Owusu-Dommey, Chad Porter, Mark Riddle, Michael Batz, Michael Bazaco, Maria Kuecken, University of Arizona, Tucson, AZ, USA

P1-44 *Salmonella* Food Poisoning Outbreaks and Climate Factors in South Korea — JONG-GYU KIM, Joong-Soon Kim, Jeong-Gyoo Kim, Keimyung University, Dalseo-Gu, Daegu, South Korea

P1-45 A Large Outbreak of *Salmonella* Food Poisoning Due to Egg White and Possible Preventive Measures — JONG-GYU KIM, Joong-Soon Kim, Jeong-Gyoo Kim, Keimyung University, Daegu, South Korea

P1-46 Occurrence of *Cyclospora cayetanensis* in Florida, 2014–2018 — LORDWIGE ATIS, Jamie DeMent, Maria Torres, Ynes Ortega, University of Georgia, Griffin, FL, USA

P1-47 A Systematic Review of Older Consumers' Food Safety Knowledge and Practices at Home — ABHINAND THAIVALAPPIL, Ian Young, Charles Paco, Apiramy Jeyapalan, Andrew Papadopoulos, University of Guelph, Guelph, ON, Canada

P1-48 Longitudinal Survey on the Prevalence of *Escherichia coli* O157:H7 in Bovine Feces and Slaughtered Carcasses from Selected Abattoirs in Southern Nigeria — Joseph Nfongeh, RINE REUBEN, Ruth Akintola, Nasarawa State Polytechnic, Lafia, Nigeria

P1-49 1+1=3: Whole Genome MIst and Whole Genome SNP, a Powerful Combination for Typing and Outbreak Surveillance of *Cronobacter* spp. — KYLE KINGSLEY, Dieter De Coninck, bioMérieux Data Analytics, Austin, TX, USA

P1-50 Whole Genome MTST as a Tool to Screen for Potential Outbreaks Quickly and Easily, Applied to a *Listeria monocytogenes* Outbreak in South Africa — KYLE KINGSLEY, Katleen Vranckx, bioMérieux Data Analytics, Austin, TX, USA

P1-51 Biosecurity Evaluation and Compliance in Broiler Breeder Farm Units in Southwest Nigeria: Implications for Poultry Farm Workers' Health and Chicken Meat Consumers — NURUDEEN OLALEKAN OLOSO, Henriette Van Heerden, Folorunso Oludayo Fasina, University of Pretoria, South Africa

P1-52 Prevalence and Serotyping of *Salmonella* spp. in Broiler Production Value Chains and the Environment in Nigeria: Implications for Public Health — NURUDEEN OLALEKAN OLOSO, Ismail Adewuyi Adeyemo, Ismail Odetokun, Adebola Olayemi Odeseye, Chaiwat Pulsrikarn, Henriette Van Heerden, Folorunso Oludayo Fasina, University of Pretoria, South Africa

P1-53 Prevalence, Molecular Characteristics and Whole Genome Sequence Analysis of CTX-M Type ESBL-producing *Escherichia coli* Isolated from Raw Milk Cheese in Egypt — AHMED HAMMAD, Maria Hoffmann, Narjol Gonzalez-Escalona, Nasser Abbas, Hadeer Alaa El Din, Kuan Yao, Anna Allué Guardia, Mark Eppinger, University of Sadat City, Sadat City, Egypt

P1-54 *Megasphaera elsdenii* and Ruminally-protected Lysine Impact on *Escherichia coli* O157:H7 Prevalence in Finishing Cattle — JOSHUA MAHER, James Drouillard, Adrian Baker, Vanessa De Aquiar Veloso, Sara Gragg, Kansas State University, Manhattan, KS, USA

P1-55 Molecular Screening for ESBL Genes in *Escherichia coli* Strains Isolated from Livestock and Bivalve Molluscs in Sicily, Italy — MARIA VITALE, Michele Fiasconaro, Maria La Giglia, Flavia Pruiti, Vincenzo Di Marco Lo Presti, Istituto Zooprofilattico Sperimentale of Sicily, Palermo, Italy

Blue Text – DevelopBlue Text – Developing Scientist Competitor Green Text - Undergraduate Student Competitor

P1-56 Public Communication as a Control Measure in Produce-related Multi-Jurisdictional Enteric Illness Outbreaks in Canada — YUHUI XU, Tanis Kershaw, Rachel McCormick, Sara Coleman, Public Health Agency of Canada, Outbreak Management Division, Centre for Food-borne, Environmental and Zoonotic Infectious Diseases, Ottawa, ON, Canada

P1-57 Chronic Sequelae of Foodborne Parasitic Gastroenteritis: A Systematic Review — Aurelie Pohl, MICHAEL BAZACO, Erika Austhof, Alexandra Armstrong, Kenzie Schaefer, Lorenzo Villa, Ama Owusu-Dommey, Michael Batz, Chad Porter, Mark Riddle, Beverly Wolpert, Angela Lasher, Andre Markon, Andrew Estrin, Kristen Pogreba-Brown, U.S. Food and Drug Administration – CFSAN, College Park, MD, USA

P1-58 Correlating *Salmonella* Isolates: Multi-drug Resistance and Serotype Concordance between CDC PulseNet Illness Clusters and FSIS-regulated Establishment Samples — WU SAN CHEN, Jeoffrey Levine, U.S. Department of Agriculture – FSIS, Atlanta, GA, USA

Communication Outreach and Education

P1-59 Kitchen Kaizen: Preliminary Findings of a Hands-on Consumer Food Safety Workshop — SHAUNA HENLEY, University of Maryland Extension, Baltimore County, Cockeysville, MD, USA

P1-60 Third Party Accreditation Final Rule: VQIP and Regulatory Audits, One Year after the ANSI Accreditation — CLAUDIO GALLOTTINI, Perry Johnson Registrars Food Safety, Inc., Troy, MI, USA

P1-61 What Do International Governments Tell Consumers about Domestic Food Safety? — SIMON DAWSON, Ellen W. Evans, Ruth Fairchild, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-62 Three Years of the Food Safety Modernization Act: Compliance Data from Europe with a Focus on the Italian Food Industry's Response — NOEMI TROMBETTI, Claudio Gallottini, Andrea Gentili, Franco Rapetti, EURO SERVIZI IMPRESA SRL, Torgiano, Italy

P1-63 Food Safety Careers: Development of an Optimized Recruitment Strategy Using the Social Cognitive Career Theory — Kristen Saniga, GABRIELA ARTEAGA-ARREDONDO, Clint Stevenson, North Carolina State University, Raleigh, NC, USA

P1-64 Food Safety Knowledge and Safe Food Handling Confidence among Pregnant Women in Louisiana — Wenqing (Wennie) Xu, Melissa Cater, GENESIS GUERRA GAITAN, Adriana Gaitan, Rebecca Gravois, LSU College of Agriculture, Baton Rouge, LA, USA

P1-65 Food Handling and Causes of Food Waste in Urban Mexican Households — DIANA GARCÍA, Ema Maldonado, Pedro Martínez, José Zaragoza, Universidad Autónoma Chapingo, Texcoco de Mora, Mexico

P1-66 Consumer Attitudes Toward Food Safety Risks in Lebanon — Victoria J. Gould, ELLEN W. EVANS, Nisreen Alwan, Laura Hjeij, Elizabeth C. Redmond, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-67 Leaving Established Pedagogy: Understanding the Educational Needs of Generation Z to Better Craft Food Safety Education — KATHARINE CLARK, Clint Stevenson, North Carolina State University, Raleigh, NC, USA

P1-68 Evaluation of Food Safety Recommendations in Egg Noodle Online Video Streaming and Blog Recipes — TRESSIE BARRETT, Yaohua (Betty) Feng, Purdue University, West Lafayette, IN, USA

P1-69 Evaluation of Food Safety Curricula Effects on Students' Food Handling Behaviors: An Observation Study — TRESSIE BARRETT, Yaohua (Betty) Feng, Purdue University, West Lafayette, IN, USA

P1-70 Food Safety in the Classroom: Evaluation of Curriculum Alignment to State Standards Using the Delphi Method — TRESSIE BARRETT, Yaohua (Betty) Feng, Purdue University, West Lafayette, IN, USA

P1-71 Evaluation of Story of Your Dinner Education Campaign Video and Blog-style Recipes — YAOHUA (BETTY) FENG, Emily Chuang, Shelley Feist, Purdue University, West Lafayette, IN, USA

P1-72 Evaluation of Food Safety Education among Indiana Veteran Farmers — Han Chen, YAOHUA (BETTY) FENG, Kevin Gibson, Cindra Chastain, Purdue University, West Lafayette, IN, USA

P1-73 What is It like to Have a Shared-use Kitchen: A Pilot Study with Young Adults — Emily Chuang, YAOHUA (BETTY) FENG, Purdue University, West Lafayette, IN, USA

P1-74 Development and Formative Evaluation of a Social Media Intervention Design — CANDICE CHRISTIAN, Rachel McDowell, Debbie Stroud, Natalie Seymour, Katrina Levine, Benjamin Chapman, North Carolina State University, Raleigh, NC, USA

P1-75 Interactive Food Safety Investigation Challenge Engages Post-Secondary Students in One Health Concepts — ADRIENNE SHEARER, Kali Kniel, University of Delaware, Newark, DE, USA

P1-76 How Does the Food Safety Knowledge of Student Dietitians Compare at a University in Wales, Lebanon and Ohio? — ELLEN W. EVANS, Victoria J. Gould, Elizabeth C. Redmond, Nisreen Alwan, Laura Hjeji, Sanja Ilic, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-77 Sport and Exercise Nutritionists' Perceptions of Food Safety Risks among Athletes — Ginnie Winter, ELLEN W. EVANS, Olivia Busby, Elizabeth C. Redmond, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-78 Utilizing Remote Covert Observation in Food Manufacturing and Processing Environments to Assess Hand Hygiene Compliance — ELLEN W. EVANS, Rebecca L. A. Evatt, Emma Samuel, Catherine Bunston, Sharon Mayho, Elizabeth C. Redmond, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-79 Aligning Food Safety Culture Assessment Tools with the Global Food Safety Initiative's Position: A Comparative Analysis — Emma Samuel, Elizabeth C. Redmond, ELLEN W. EVANS, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-80 Seeing is Believing: CCTV Perspectives in Food Manufacturing — Emma Samuel, Elizabeth C. Redmond, ELLEN W. EVANS, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-81 Overcoming Biological Adsorption Limitations of Bacteriophages through Use of Short Tail Fibers Capable of Targeting Highly Conserved Core Regions within Bacterial Lipopolysaccharides — EMMA FARQUHARSON, Sam Nugen, Cornell University, Ithaca, NY, USA

P1-82 Engaging Undergraduate Students in the Importance of Food Microbiology and Safety — ELLEN MENDEZ, Cassandra Jones, Valentina Trinetta, KSU Food Science Institute, Manhattan, KS, USA

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P1-85 Food Safety Education and Outreach for Florida Farmers — Jessica Lepper, Michelle Danyluk, Travis Chapin, MATTHEW KRUG, Rachel McEgan, Amy Harder, Lendel Narine, Renee Goodrich, Taylor Langford, Joyjit Saha, University of Florida SWFREC, Immokalee, FL, USA

P1-86 Food Handler Awareness of Allergen Management Systems in Welsh Food Manufacturing Businesses — Leanne Ellis, Ginnie Winter, HELEN TAYLOR, Ellen W. Evans, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-87 A Support Package to Support Small Food Manufacturing Businesses in Wales in Overcoming Barriers to Obtain Food Safety Certification: A Pilot Study — HELEN TAYLOR, Jessica Lacey, Bethan Rowlands, Rhiannon Facey-Richards, Ross Hann, Ellen W. Evans, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P1-88 Use of a Multidisciplinary Program Approach to Assist Food Entrepreneurs in Mitigating Business, Financial and Food Safety Risks — COURTNEY CRIST, Elizabeth Canales, Mississippi State University, Starkville, MS, USA

P1-89 Development of a Hands-on and Demonstration-based Produce Food Safety Training Curriculum — TRAVIS CHAPIN, Michelle Danyluk, Sebastian Galindo-Gonzalez, Mary Beth Henry, Robert Hochmuth, Matthew Krug, Jose Perez, Danielle Treadwell, University of Florida CREC, Lake Alfred, FL, USA

P1-90 Health Professionals as a Trusted Source for Food Safety Education: A Pilot Study in China and Peru — HAN CHEN, Valeria Martinez, Yaohua (Betty) Feng, Purdue University, West Lafayette, IN, USA

P1-91 Effective Delivery of an Online Good Manufacturing Practices Course to Teach Regulatory Requirements and Food Safety Practices — ELIZABETH DEMMINGS, Robert Way, Elizabeth Bihn, Cornell University, Geneva, NY, USA

P1-92 Investigating the Effect of Washing Raw Chicken on Cross-Contamination to Kitchen Surfaces and Ready-to-Eat Food Products — MARGARET KIRCHNER, Rebecca Goulter, Savana Everhart, Lydia Goodson, Lisa Shelley, Chris Bernstein, Ellen Shumaker, Sheryl Cates, Lee-Ann Jaykus, Benjamin Chapman, North Carolina State University, Raleigh, NC, USA

P1-93 Understanding Poultry Washing and Post-washing Cleaning and Sanitizing Behaviors of Consumers — LYDIA GOODSON, Lisa Shelley, Rebecca Goulter, Savana Everhart, Chris Bernstein, Ellen Shumaker, Sheryl Cates, Lee-Ann Jaykus, Benjamin Chapman, North Carolina State University, Raleigh, NC, USA

P1-94 Creation and Implementation of a Social Marketing Campaign for Beef Food Safety — BENJAMIN CHAPMAN, Jill Hochstein, John Luchansky, Kyle Longacre, Anna Porto-Fett, North Carolina State University, Raleigh, NC, USA

P1-95 Needs Assessment Survey of Processors of Human Food in Tennessee for Meeting the Requirements of the Food Safety Modernization Act — ABIMBOLA ALLISON, Monica Henry, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-96 Sensitivity of *Bacillus amyloliquefaciens*, *Geobacillus stearothermophilus*, and *Bacillus atrophaeus* to Elevated Hydrostatic Pressure in the Presence of Mild Heat, Nisin and Lysozyme — ABIMBOLA ALLISON, Niamul Kabir, Sadiye Aras, Shahid Chowdhury, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-97 Updates on a Planning Activity Project for Development and Implementation of an Intercollegiate MPH Degree Tracked in Food Safety and Foodborne Diseases Epidemiology — ALIYAR FOULADKHAH, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

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P1-98 Advances in Validation Studies for Pressure-based Pasteurization of Microbial Pathogens, Pressure-adapted Microorganisms, and Bacterial Spores — ALIYAR FOULADKHAH, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-99 Pressure-based Pasteurization of Wild-type and Acid-adapted *Escherichia coli* O157 and Non-typhoidal *Salmonella* Serovars in Orange Juice — JAYASHAN ADHIKARI, Abimbola Allison, Monica Henry, Shahid Chowdhury, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-100 Photodynamic Treatment of *Bacillus cereus* Strains: Estimating the Inactivation Kinetic Parameters of Four Strains from Different Sources — Leonardo Prado-Silva, Leonardo Ramos, Verônica Ortiz Alvarenga, Gilberto U. L. Braga, ANDERSON DE SOUZA SANT'ANA, Department of Food Science, College of Food Engineering - University of Campinas, Campinas, Brazil

P1-101 Processing of Dried Beef (Biltong) without a Heat Lethality Step to Achieve USDA-FSIS Validation (Five-Log Reduction) of *Salmonella* — CAITLIN KAROLENKO, Arjun Bhusal, Jacob Nelson, Peter Muriana, Oklahoma State University, Stillwater, OK, USA

P1-102 Inactivation of Shiga Toxin-producing *Escherichia coli, Salmonella enterica* and Natural Microflora on Artificially Inoculated Wheat Grains by Atmospheric Cold Plasma — EMALIE THOMAS-POPO, Aubrey Mendonca, NN Misra, Allison Little, Zifan Wan, Rkia Moutiq, Shannon Coleman, Kevin Keener, Iowa State University, Ames, IA, USA

P1-103 Survival and Inactivation of Wild-type and Rifampicin-resistant *Cronobacter sakazakii* and Background Microflora of Infant Formula Using Mild Hydrostatic Pressure — Kaleh Karim, Kayla Sampson, Monica Henry, NIAMUL KABIR, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-104 Effects of Come-up and Come-down Times on Efficacy of Pressure-based Pasteurization of *Escherichia coli* O157:H7, *Listeria monocytogenes*, and Non-Typhoidal *Salmonella* Serovars — NIAMUL KABIR, Shahid Chowdhury, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-105 How Virginia Extension Agents Engage with the Public about Food Processing Perceptions — NICOLE ARNOLD, Melissa Chase, Tiffany Drape, Lily Yang, Robert Williams, Renee Boyer, Virginia Tech, Blacksburg, VA, USA

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P1-107 Evaluation of Initial and Post-High Pressure Pasteurization Treatment Storage Temperatures as Critical Process Factors — SHIRIN ABD, Carrie Ferstl, Eurofins, Livermore, CA, USA

P1-108 Evaluation of Adaptive Response in *E. coli* O157:H7 to Light and Gallic Acid-based Antimicrobial Treatments — QINGYANG WANG, Robert Buchanan, Rohan Tikekar, University of Maryland, College Park, MD, USA

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P1-109 Ensuring Food Emergency Response Network Laboratory Preparedness for Detecting *B. anthracis* and *Y. pestis* from Food — SHANNON PICKENS, Matthew Kmet, Robert Newkirk, Vishnu Patel, Donald Burr, Ravinder Reddy, Tara Doran, Illinois Institute of Technology / IFSH, Bedford Park, IL, USA

P1-110 Evaluation of Freeze-drying Conditions for Extension of Bacteriophage Shelf Life — DOMINIQUE PACITTO, Philip Pivarnik, Andre Senecal, U.S. Army NSRDEC, Natick, MA, USA

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P1-111 Food Safety Modernization Act Subpart M: An Evaluation of Pathogen Testing Requirements — EMILY KELLY, Maha Hajmeer, Michael Needham, California Department of Public Health, Sacramento, CA, USA

P1-112 North Central Region Pre- and Post-Grower Training Knowledge Assessment — BRIDGET PERRY, Arlene Enderton, Shannon Coleman, Angela Shaw, Iowa State University, Ames, IA, USA

P1-113 Louisiana Wild-Caught Catfish under USDA Inspection — KATHERYN PARRAGA, Evelyn Watts, Louisiana State University, Baton Rouge, LA, USA

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P1-116 Inactivation of *Enterococcus faecium* and *Salmonella* in Fried Potato-based Snacks — Abdullatif Tay, Rico Suhalim, Amy Parks, ERDOGAN CEYLAN, Mérieux NutriSciences, Crete, IL, USA

P1-117 An Assessment of Food Safety Training Needs and Preferences among Ohio Food Processors of Various Sizes — NICHOLAS BARONE, Abigail Snyder, The Ohio State University, Columbus, OH, USA

Blue Text – Developing Scientist Competitor

Green Text - Undergraduate Student Competitor

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P1-119 Evaluation of Hydrocooling with Two Different Sanitizers in Reducing Microbial Load and Shelf Life for Whole Corn — Jaysankar De, Bruna Bertoldi, CHRISTOPHER PABST, Christopher Baker, Alan Gutierrez, Steven Sargent, Keith Schneider, University of Florida, Gainesville, FL, USA

P1-120 Advanced Environmental Sampling and Testing Methods for Outbreak Investigations — Amy Kahler, MIA MATTIOLI, Jennifer Murphy, Centers for Disease Control and Prevention, Division of Foodborne, Waterborne and Environmental Diseases, Atlanta, GA, USA

P1-121 Bactericidal Effect of Non-Thermal Plasma Against Foodborne Pathogens on Diverse Foods — JIN-YOUNG HAN, Won-Jae Song, Dong-Hyun Kang, Seoul National University, Seoul, South Korea

P1-122 Comparing Efficacy of Hydrocooling with Different Concentrations of Free Chlorine in Reducing Microbial Load from Whole Corn — JAYSANKAR DE, Bruna Bertoldi, Christopher Pabst, Christopher Baker, Steven Sargent, Keith Schneider, University of Florida, Gainesville, FL, USA

P1-123 Prevalence, Molecular Characterization and Antibiotic Resistance of Non-O157 Shiga Toxin-producing *Escherichia coli* in Street Vended Meat Products in Nigeria— OLANREWAJU E. FAYEMI, Mountain Top University, Prayer City, Nigeria

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P1-126 Deep Cleans Alone Do Not Reduce *Listeria monocytogenes* Persistence in Retail Delis with Known High Prevalence — SOPHIE TONGYU WU, Susan Hammons, Haley Oliver, Purdue University, West Lafayette, IN, USA

P1-127 Microbiological Risk Assessment of *Staphylococcus aureus* in Ready-to-Eat Lettuce in Taiwan — Hui-Erh Chai, Kuan-Hung Lu, Tsui-Ping Huang, Chun-Lung Cheng, Lihan Huang, Cheng-An Hwang, Shiowshuh Sheen, LEE-YAN SHEEN, Institute of Food Science and Technology, National Taiwan University, Taipei, Taiwan

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P1-129 Comparison Between Random Forest and Gradient Boosting Machine Methods for Predicting *Listeria* spp. Prevalence in the Environment of Pastured Poultry Farms — CHASE GOLDEN, Michael Rothrock, Abhinav Mishra, University of Georgia, Athens, GA, USA

P1-130 Risk Estimation of *Clostridium perfringens* from the Consumption of Hamburger and Sandwich Products Available in Retail Markets Using Probabilistic Modeling — Jin Hwa Park, Yun Hui Choi, Sang-Do Ha, Yohan Yoon, HYUN JUNG KIM, Korea Food Research Institute, Wanju, South Korea

P1-131 Quantitative Assessment of Listeriosis Risk from Domestic Cheese Consumption in Korea — JU YOUNG LIM, Ha Yeon Jo, Kun-Ho Seo, Ki Sun Yoon, Kyung Hee University, Seoul, South Korea

P1-132 Quantitative Microbial Risk Assessment of *Listeria monocytogenes* in Smoked Salmon from Retail Market to Home — KI YOUNG SONG, Jeong Yeon Lee, Eun Woo Lee, Ki Sun Yoon, Kyung Hee University, Seoul, South Korea

P1-133 Model Development for Survival and Growth of *Vibrio parahaemolyticus* in Tuna Sashimi as a Function of Temperature — Yun Jin Lee, Mi jin Kwon, KI YOUNG SONG, Ki Sun Yoon, Kyung Hee University, Seoul, South Korea

P1-134 Quantitative Risk Assessment for *Clostridium perfringens* in Pickles and Kimchi — YUKYUNG CHOI, Woori Kim, Sang-Do Ha, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-135 Microbial Risk Assessment of *Vibrio parahaemolyticus* in the Salted Seafood Jeotgal — JOOHYUN KANG, Woori Kim, Min Suk Rhee, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-136 Knowledge, Attitudes and Practices of Hygiene and Food Safety in Health Professionals in a University Hospital of Lisbon — Cecília Gomes, António Fernandes, CARLOS BRANDÃO, Estoril Higher Institute for Tourism and Hotel Studies - Department of Food Sciences, Estoril, Portugal

P1-137 Evaluation of Food Defense in Hospitality — Marcos Jerónimo, Cátia Morgado, António Fernandes, CARLOS BRANDÃO, Estoril Higher Institute for Tourism and Hotel Studies - Department of Food Sciences, Estoril, Portugal

P1-138 Risk Assessment of *Clostridium perfringens* in Salted and Fermented Squid (Squid Jeotgal) — YEWON LEE, Woori Kim, Sang-Do Ha, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-139 Risk Assessment of *Clostridium perfringens* in Paste-type Fermented Sauces — YEONGEUN SEO, Min Suk Rhee, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-140 Effect of Packaging on the Risk of *Clostridium perfringens* in Ready-to-Eat Lunch Boxes Sold at Convenience Stores — SU JIN KIM, Jeong Yeon Lee, Sang-Do Ha, Ki Sun Yoon, Kyung Hee University, Seoul, South Korea

P1-141 Quantitative Microbial Risk Assessment of *Vibrio parahaemolyticus* from the Consumption of Ready-to-Eat Foods Containing Seafood Available in Retail Markets — JIN HWA PARK, Min Suk Rhee, Yohan Yoon, Hyun Jung Kim, Korea Food Research Institute, Wanju, South Korea

P1-142 Quantitative Risk Assessment Modeling Techniques in Managing Microbiological Food Safety Risks: Risk-based Hazard Analysis Critical Control Point Plans — ELIZABETH NOELIA WILLIAMS, Robert Buchanan, University of Maryland, College Park, MD, USA

P1-143 Comparison of Linear and Non-linear Models to Describe the Inactivation Kinetics of Vegetative Pathogens during Oil Roasting of Sunflower Kernels — STEPHANIE NGUYEN, Kelly Dawson, Balasubrahmanyam Kottapalli, Deann Akins-Lewenthal, Conagra Brands, Omaha, NE, USA

P1-144 Monetizing the Impact of Food Safety Recalls on the Low-moisture Food Industry — CARLY GOMEZ, Bradley Marks, Michigan State University, East Lansing, MI, USA

P1-145 Creating a Risk Model for Nosocomial Listeriosis in Cancer Patients Who Consume Ready-to-Eat Salad — CARLY GOMEZ, Bradley Marks, Sanja Ilic, Holly Paden, Elliot Ryser, Jade Mitchell, Michigan State University, East Lansing, MI, USA

P1-146 Heterologous Stress Adaptation to Gentamicin in Four Strains of *Listeria monocytogenes* after Sublethal Adaptive Response to Quaternary Ammonium Compound (QAC) — DIVYA KODE, Ramakrishna Nannapaneni, Mohit Bansal, Wen-Hsing Cheng, Chander Shekhar Sharma, Aaron Kiess, Mississippi State University, Mississippi State, MS, USA

P1-147 Distribution of Toxin Genes and Antimicrobial Resistance Genes among Staphylococci Isolated from Clinical and Food Samples in Algeria — Rachid Achek, Leila Bouayad, Radia Bouhamed, Zafer Cantekin, TAHA MOSSADAK HAMDI, Laboratory of Food Hygiene and Quality Insurance System (HASAQ), High National Veterinary School, Algiers, Algeria

P1-148 Homologous Stress Adaptation in Four Strains of *Listeria monocytogenes* to Quaternary Ammonium Compounds after Sublethal Exposure — DIVYA KODE, Ramakrishna Nannapaneni, Mohit Bansal, Wen-Hsing Cheng, Chander Shekhar Sharma, Aaron Kiess, Mississippi State University, Mississippi State, MS, USA

P1-149 Application of Metagenomics to Define Microbiomes and Detect *Listeria monocytogenes* in Smoked Fish and Ice Cream Facilities — BRANDON KOCUREK, Karen Jarvis, Christopher Grim, Paul Morin, Laura Howard, Andrea Ottesen, Ruth Timme, Padmini Ramachandran, Susan Leonard, Hugh Rand, Daniel Tadesse, Errol Strain, James Pettengill, David Lacher, Mark Mammel, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

P1-150 Development of Kinetic Models with *Salmonella* Isolates from Poultry to Describe the Kinetic Behavior in Chicken and Duck Tenderloins — HYEMIN OH, Heeyoung Lee, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-151 Evaluation of Kinetic Responses of Pathogenic *Escherichia coli* in Smoked Duck under Dynamic Conditions — EUNYOUNG PARK, Joo-Sung Kim, Doyeon Kim, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-152 Physiological Characterization of *Listeria monocytogenes* Isolates from Smoked Duck — EUNYOUNG PARK, Joo-Sung Kim, Doyeon Kim, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-153 Predictive Model of Growth of *Listeria monocytogenes* in Queso Fresco Cheese — MERLYN THOMAS, Abhinav Mishra, University of Georgia, Athens, GA, USA

P1-154 Modeling the Survival Kinetics of *Campylobacter jejuni* in Simulated Gastric Fluid — KOHEI TAKEOKA, Hiroki Abe, Kento Koyama, Shige Koseki, Hokkaido University, Sapporo, Japan

P1-155 Kinetic Behavior of *Salmonella* in Cucumber under Changing Temperatures — JIMYEONG HA, Joo-Sung Kim, Doyeon Kim, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-156 Development of a Dynamic Model to Describe the Fate of *Escherichia coli* in Diced Cucumbers under Dynamic Temperatures — JIMYEONG HA, Joo-Sung Kim, Doyeon Kim, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P1-157 A Risk Assessment Study of *Staphylococcus aureus* in Pancake Batter — AMANDA SISNEY, Nancy Dobmeier, Conagra Brands, Omaha, NE, USA

P1-158 A Risk Assessment Study of *Staphylococcus aureus* and *Bacillus cereus* in Beans Based on the Potential for Product Accumulation during Food Processing — AMANDA SISNEY, Christopher Showalter, Conagra Brands, Omaha, NE, USA

P1-159 Models for Survival of Foodborne Pathogens in Low-water Activity Foods Using Literature Data — MATTHEW IGO, Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA

P1-160 Determining Food Safety Modernization Act Compliance in Produce Packinghouses in the Dominican Republic — LAUREL DUNN, Lynette Orellana, Neil James, Ernest Jones, Quintin Gray, Rachel Fernandez, Johnesha Jackson, Gregory McNealy, Halimah Wynn, Jorge Del'Angel, Harriett Paul, University of Georgia, Athens, GA, USA

P1-161 Growth of *Clostridium perfringens* in Cooked Chicken during Cooling: One-step Dynamic Inverse Analysis, Sensitivity Analysis, and Markov Chain Monte Carlo Simulation — LIHAN HUANG, Eastern Regional Research Center, Agricultural Research Service, USDA, Wyndmoor, PA, USA

P1-162 Growth of Non-toxigenic *Clostridium botulinum* Mutant LNT01 in Cooked Beef: One-step Kinetic Analysis and Comparison with *C. sporogenes* and *C. perfringens* during Dynamic Cooling — LIHAN HUANG, Eastern Regional Research Center, Agricultural Research Service, USDA, Wyndmoor, PA, USA

P1-163 Predictive Model for Growth of *Clostridium botulinum* from Spores in Beef during Cooling — VIJAY JUNEJA, Max Golden, Anuj Purohit, Abhinav Mishra, Harshavardhan Thippareddi, Kathleen Glass, U.S. Department of Agriculture, ARS-ERRC, Wyndmoor, PA, USA

P1-164 Validation of the UltraSnap Surface ATP Test and Ensure Luminometer for ATP Hygiene Monitoring on Stainless Steel Surfaces — PAUL MEIGHAN, Mat Smith, Richard Todd, Hygiena, Camarillo, CA, USA

P1-165 Identifying Risk Factors Associated with *Salmonella* Prevalence in Southeastern United States' Pastured Poultry Farms — DAIZY HWANG, Michael Rothrock, Abhinav Mishra, University of Georgia, Athens, GA, USA

P1-166 A Predictive Model for Cross-Contamination of *Salmonella* in the Poultry Chilling Process — Xingning Xiao, Wen Wang, Jianmin Zhang, Ming Liao, Hua Yang, Qiang Wang, YANBIN LI, Institute of Quality and Standard of Agricultural Products, Zhejiang Academy of Agricultural Sciences, Hangzhou, China

P1-167 Development of an Agent-based Model for Norovirus Contamination of Berries from Infected Workers on the Farm — ROBYN MIRANDA, Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA

P1-168 Understanding the Cross-Contamination of Melons Via Environmental Matrices Simulating Field Conditions — RICHARD PARK, Aishwarya Rao, Martin Porchas, Paul Brierley, Sadhana Ravishankar, University of Arizona, Tucson, AZ, USA

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P1-170 Identification of Sources of Nickel Contamination in Foods and Its Exposure Assessment — Mehrnoosh Babaahmadi-Fooladi, Gijs Du Laing, LIESBETH JACXSENS, Ghent University, Ghent, Belgium

P1-171 Estimated Daily Intake and Cumulative Risk Assessment of Perchlorate via Diverse Foods for Taiwanese Populations — WEI-HSIANG CHANG, Ching-Chang Lee, Research Center for Environmental Trace Toxic Substances, National Cheng Kung University, Tainan, Taiwan

P1-172 Risk Assessment for Non Dioxin-like Polychlorinated Biphenyl Exposure from Food Consumption in Taiwan — HSIU-LING CHEN, Department of Food Safety/Hygiene and Risk Management, National Cheng Kuang University, Tainan, Taiwan

P1-173 Occurrence and Profiles of Phthalates in Processed Food from Taiwan and Their Implications for Human Exposure — CHING-CHANG LEE, Wei-Hsiang Chang, Guan-Liang Wu, Department of Environmental and Occupational Health, National Cheng Kung University, Tainan, Taiwan

P1-174 Predictive Microbial Modeling of Baking Inactivation Kinetics — QUINCY SUEHR, Nathan Anderson, U.S. Food and Drug Administration, Bedford Park, IL, USA

P1-175 The Impact of Free Chlorine Concentration in Fresh-cut Romaine Lettuce Wash Water on *E. coli* O157:H7 Cross-Contamination and Risk of Foodborne Illness in the United States — SOFIA SANTILLANA FARAKOS, Amir Mokhtari, Gordon Davidson, Elizabeth Noelia Williams, Jane Van Doren, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

P1-176 A Comparative Study of Heavy Metal Exposure Risk from the Consumption of Some Common Varieties of Cultured and Captured Fishes in Bangladesh — MOHAMMAD RUZLAN HABIB, Shahjalal University of Science and Technology, Dhaka, Bangladesh

P1-177 Introduction to the Calculation and Interpretation of Level of Detection — STEFFEN UHLIG, Ravinder Reddy, Bertrand Colson, Kirsten Simon, Samantha Lindemann, Matthew Kmet, QuoData GmbH, Dresden, Germany

P1-178 Application of Machine Learning for Food Safety Data Analysis — WEN ZOU, Weizhong Zhao, Junxiu Zhou, Kavina Munshi, NCTR/FDA, Jefferson, AR, USA

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P1-179 Prevalence of Major Antimicrobial Resistance Mechanisms in Putative Extended Spectrum β-Lactamase *Escherichia coli* Isolated from Beef Production Systems and Humans Using Whole Genome Sequencing — EMELIA ADATOR, Claudia Narvaez, Rahat Zaheer, Tim A. McAllister, University of Manitoba, Winnipeg, MB, Canada

P1-180 The GenomeTrakr Database Global WGS Network for Foodborne Pathogen Traceback — MARC ALLARD, Ruth Timme, Maria Sanchez, Eric Stevens, Maria Hoffmann, Kuan Yao, George Kastanis, Daniela Miller, Tim Muruvanda, Sara Lomonaco, Errol Strain, Justin Payne, Arthur Pightling, Hugh Rand, James Pettengill, Yan Luo, Narjol Gonzales-Escalona, David Melka, Phillip Curry,, U.S. Food and Drug Administration, Center for Food Safety & Applied Nutrition, College Park, MD, USA

P1-181 Use of Whole Genome Sequencing, Epidemiologic, and Traceback Data to Link a Multistate *Listeria monocytogenes* Outbreak to Ready-to-Eat Pork Products — UDIT MINOCHA, Jennifer Freiman, Jovita Haro, Glenn Tillman, Mustafa Simmons, Meryl Silverman, Maria Scott, Brad Webb, Amanda Conrad, Danielle Donovan, Vivienne Heines, Brenda Rue, Natalie Christophe, Sakina Hamdani, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

Blue Text – Developing Scientist Competitor

Green Text - Undergraduate Student Competitor

P1-182 Long Read Sequencing for Food Safety Applications — XUWEN WIENEKE, Sarita Raengpradub, Jiaojie Zheng, Timothy Freier, Mérieux NutriSciences, Crete, IL, USA

P1-183 Molecular Characterization of Native *Lactobacillus* Strains Isolated from *Vaccinium floribundum* Kunth by Partial Sequencing of 16S rDNA Genes — Celia Vargas, Carmen López, Teresa Gallardo, FÉLIX RAMOS, Daniela Landa, Centro Latinoamericano de Enseñanza e Investigación de Bacteriología Alimentaria (CLEIBA), Facultad de Farmacia y Bioquímica, Universidad Nacional Mayor de San Marcos, Lima, Peru

P1-184 Implications of Mobile Genetic Elements for *Salmonella enterica* Single Nucleotide Polymorphism Subtyping and Source Tracking Investigations — SHAOTING LI, Shaokang Zhang, Leen Baert, Bala Jagadeesan, Catherine Ngom-Bru, Xiangyu Deng, University of Georgia, Center for Food Safety, Griffin, GA, USA

P1-185 Microbial Genetics and Clonal Dissemination of Clinical *Salmonella* Javiana in the Southeastern United States — YASSER M. SANAD, Joanna Deck, Rajesh Nayak, Bijay Khajanchi, Ashraf Khan, Jing Han, Rossina Stefanova, Steven Foley, Department of Agriculture, School of Agriculture, Fisheries, and Human Sciences, University of Arkansas, Pine Bluff, AR, USA

P1-186 *Pseudomonadaceae* and *Dipodascaceae* Were Associated with Persistent Occurrence of *Listeria monocytogenes* in a Longitudinal Microbiome Monitoring of Three Apple Packinghouses — Xiaoqing Tan, TAEJUNG CHUNG, Yi Chen, Dumitru Macarisin, Luke LaBorde, Jasna Kovac, The Pennsylvania State University, University Park, PA, USA

P1-187 Associations between Microbial Ecology, Environmental Factors and Microbiological Quality of Surface Waters Collected in the Northeast United States — TAEJUNG CHUNG, Daniel Weller, Jasna Kovac, The Pennsylvania State University, University Park, PA, USA

P1-188 Organic Amendments Influence the Rhizosphere and Phyllosphere Microbiota Profiles of Collard Greens Grown in Southeast Texas — Kimani Bradley, Ellen-Ashley Williams, Dalais Bailey, Mahta Moussavi, Haimanote Bayabil, Almoutaz El-Hassan, Ripendra Awal, Ali Fares, Deland Myers, JAVAD BAROUEI, Prairie View A&M University, Prairie View, TX, USA

P1-189 Diversity of the *Escherichia coli* O145:H28 Accessory Genome Including Shiga Toxin-converting Prophages Originating from a Leafy Greens Growing Region in California — MICHELLE QIU CARTER, Antares Pham, Stephanie Patfield, Xiaohua He, USDA, ARS, WRRC, Albany, CA, USA

P1-190 Food Component Influence on the Water Activity and Net Isosteric Heat of Sorption for Low-moisture Foods at Elevated Temperatures — YUQIAO JIN, Juming Tang, Washington State University, Pullman, WA, USA

P1-191 Evaluation of Genetic Relatedness and Plasmid-mediated Virulence of *Salmonella* Schwarzengrund Strains Isolated from Food and Clinical Sources — BIJAY KHAJANCHI, Noah Yoskowitz, Jing Han, Christopher Grim, Shaohua Zhao, Steven Foley, U.S. Food and Drug Administration, Jefferson, AR, USA

P1-192 Whole Genome Sequences of Potentially Toxigenic Fungi from Walnuts, Peanuts, and Selected Fruits — SOLOMON GEBRU, Mark Mammel, Jayanthi Gangiredla, Vasiliki H. Tournas, Carmen Tartera, U.S. Food and Drug Administration, Laurel, MD, USA

P1-193 Enterotoxigenic Profile Characterization of *Bacillus cereus* Using Targeted RNA Sequencing — GUOJIE CAO, Jennifer Hait, George Kastanis, Sandra Tallent, U.S. Food and Drug Administration, College Park, MD, USA

P1-194 Distribution of Antimicrobial Resistance Genes Across Nontyphoidal *Salmonella enterica* Isolates from Various Foods — MICHAEL BAZACO, Heather Tate, Kathleen Gensheimer, Shaohua Zhao, John Ihrie, Andre Markon, James Pettengill, U.S. Food and Drug Administration, Silver Spring, MD, USA

P1-195 Comparative Genomic Analysis of Acinetobacter Isolated from Fresh Produce and Clinical Isolates — TAKIYAH BALL, Mark Mammel, David Lacher, Chiun-Kang Hsu, Susan Leonard, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

P1-196 Development of Next-Generation Sequencing and Metagenomics for Detection of Foodborne Viruses Within Oysters — ZHIHUI YANG, Gloria Meade, Mark Mammel, Marianne Solomotis, David Kingsley, U.S. Food and Drug Administration, Laurel, MD, USA

P1-197 Frequency of Multi-Locus Sequence Types in FSIS-regulated Ready-to-Eat Products — CARRIE CLARK, Mary Katherine Crews, Glenn Tillman, Mustafa Simmons, Jamie Wasilenko, Udit Minocha, Yoel Izsak, Scott Seys, Stevie Hretz, Meryl Silverman, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

P1-198 Taxonomic and Functional Shifts in Sprout Spent Irrigation Water Microbiome Due to *Salmonella* Contamination of Alfalfa Seeds — Elizabeth Reed, Yu Wang, Padmini Ramachandran, Andrea Ottesen, Eric Brown, JIE ZHENG, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

P1-199 Dynamics of Microbiome Composition during Enrichment of *Campylobacter* in Poultry Samples — RUNAN YAN, Andrea Ottesen, Padmini Ramachandran, Errol Strain, Elizabeth Reed, Jasna Kovac, The Pennsylvania State University, University Park, PA, USA

P1-200 A Retrospective Study Using Whole Genome Sequencing to Characterize *Listeria monocytogenes* Strains Found in Domestic and Imported Cheeses from 2000–Present — LAURA HOWARD, Paul Morin, U.S. Food and Drug Administration, ORA/NFFL, Jamaica, NY, USA

Low-water Activity Foods

P1-201 Global Gene Expression Analysis of *Salmonella* Contaminating Low-moisture Foods — VICTOR JAYEOLA, Jeffrey Farber, Sophia Kathariou, North Carolina State University, Raleigh, NC, USA

P1-202 Identification of the Lowest Lethality Zone in Wheat Flour Treated with Radio-Frequency Heating and Natural Cooling — JIE XU, Ren Yang, Yuqiao Jin, Graham Barnett, Juming Tang, Washington State University, Pullman, WA, USA

P1-203 Simulated Commercial Baking Validation of Peanut Butter Bars to Control *Salmonella* — DANIEL VEGA, Nicholas Sevart, Lakshmikantha Channaiah, Randall Phebus, Harshavardhan Thippareddi, Kansas State University, Manhattan, KS, USA

P1-204 Quantifying the Inactivation of *Enterococcus faecium* during Spray Drying — PHILIP STEINBRUNNER, Elliot Ryser, Kirk Dolan, Bradley Marks, Sanghyup Jeong, Michigan State University, East Lansing, MI, USA

P1-205 *Salmonella* and Surrogate Microorganism Behavior in Homemade Play Dough Based on Online Recipes — JIIN JUNG, Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA

P1-206 Butylparaben Improves the Thermal Inactivation Rate of *Escherichia coli* O157:H7 in Low-moisture Foods — Qiao Ding, Chongtao Ge, Robert Buchanan, ROHAN TIKEKAR, University of Maryland, College Park, MD, USA

P1-207 Evaluation of Methods for Inoculating *Salmonella* into Dairy Powders — Fangyu Chen, Alisha Aggarwal, Susanne Keller, Nathan Anderson, ELIZABETH GRASSO-KELLEY, Illinois Institute of Technology, Bedford Park, IL, USA

P1-208 Validation of a Cracker Baking Process Using Predictive Modeling — IAN HILDEBRANDT, Linnea Riddell, Michael James, Nicole Hall, Bradley Marks, Michigan State University, East Lansing, MI, USA

P1-209 Comparative Evaluation of *Salmonella* Recovery from Cinnamon Bark and Oregano Leaves Using Either Aluminosilicate Molecular Sieves in Pre-Enrichment Media or the FDA BAM Method — Uma Babu, Lisa Harrison, Isha Patel, Mark Mammel, Elmer Bigley III, KANNAN BALAN, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

P1-210 Isothermal Inactivation of *Enterococcus faecium* NRRL B-2354 in Individual Ingredients and Formulated Cookie Dough — XIYANG LIU, Quincy Suehr, Elizabeth Grasso-Kelley, Nathan Anderson, IFSH, Bedford Park, IL, USA

P1-211 Long-term Survival of *Listeria monocytogenes* on Nuts and Seeds as Affected by Relative Humidity Storage Conditions — JOELLE K. SALAZAR, Vidya Natarajan, Diana Stewart, Quincy Suehr, Tanvi Mhetras, Lauren J. Gonsalves, Mary Lou Tortorello, U.S. Food and Drug Administration, Bedford Park, IL, USA

Blue Text – Developing Scientist Competitor

Green Text - Undergraduate Student Competitor

P1-212 Efficacy of a Patented Peracetic Acid-based Sanitizing Solution Against a Shiga Toxin-producing *Escherichia coli* Surrogate during Wheat Tempering — Fatemeh Rahmany, Alma Fernanda Sanchez-Maldonado, REBECCA KAREN HYLTON, Pooneh Peyvandi, Amir Hamidi, Fadi Dagher, Agri-Neo Inc., Toronto, ON, Canada

P1-213 Patented Peracetic Acid-based Sanitizing Solution Achieves > 4 log CFU/g Reduction in *Salmonella* and Its Surrogate, *Enterococcus faecium* NRRL B-2354, on Alfalfa Seeds While Maintaining High Germination Rates — REBECCA KAREN HYLTON, Alma Fernanda Sanchez-Maldonado, Pooneh Peyvandi, Fatemeh Rahmany, Fadi Dagher, Amir Hamidi, Agri-Neo Inc., Toronto, ON, Canada

P1-214 Performance Evaluation of a Fluorescence Resonance Energy Transfer-based Real-time PCR Assay for the Detection of Pathogens in 25 g and 375 g Walnut Samples — VIKRANT DUTTA, Thomas Jones, Kyla Ihde, bioMérieux Inc., Hazelwood, MO, USA

P1-215 Evaluating Steam Treatment as a Potential Intervention for Microbial Risk Reduction of In-Shell Pecans — KARUNA KHAREL, Achyut Adhikari, Louisiana State University AgCenter, Baton Rouge, LA, USA

P1-216 U.S. Food and Drug Administration's Total Diet Study (TDS): Process and Challenges Faced in Modernizing the Food List — STEPHANIE KENEZ, Dana Hoffman-Pennesi, Alexandra Gavelek, Judith Spungen, Edward Nyambok, Terry Councell, Mark Wirtz, U.S. Food and Drug Administration, College Park, MD, USA

P1-217 Rapid Bioluminescence Detection of Bacteria in Cannabis-infused Foods Using Microsnap — Paul Meighan, Delia Calderon, Brandon Katz, RICHARD TODD, Jack Garretty, Hygiena, Guildford, United Kingdom

P1-218 Is It Safe to Use Drinking Water Treatment Residues from Harmful Algal Bloom-affected Areas for Land Application? — YUEHAN AI, Seungjun Lee, Jiyoung Lee, The Ohio State University, Columbus, OH, USA

P1-219 Quantification of Aflatoxin B1 in *Aspergillus parasiticus* and *A. flavus* in Peanuts Treated with Plant-based Antimicrobial Compounds — YAWA ZOLOME, Shideh Khorsandi, Premila Achar, Huggins Msimanga, Kennesaw State University, Kennesaw, GA, USA

P1-220 Validation of an ELISA-based Assay for Specific Detection and Quantification of Pecan and Macadamia Protein in Food Matrices, Clean-in-Place Rinse Water and Environmental Samples — Gabriela Lopez Velasco, Mara Celt, Patrick Mach, Sarah Sykora, RAJ RAJAGOPAL, Burcu Yordem, 3M Food Safety, St. Paul, MN, USA

P1-221 Stability Study of Milk, Egg and Peanut Protein in Swabs Utilized for Environmental Sampling Including Stability during Shipping and Storage after Sample Collection — Gabriela Lopez Velasco, Mara Celt, Patrick Mach, Sarah Sykora, Burcu Yordem, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

P1-222 Enzymatic Treatments to Reduce the Allergenicity of Almond Milk — JINGJING CHEN, Qianqian Zhu, Bo Jiang, Jiangnan University, Wuxi, China

P1-223 Western Blot Analysis of Fermented-Hydrolyzed Foods Utilizing Gluten-specific Antibodies Employed in a Novel Multiplex-Competitive ELISA — RAKHI PANDA, Eric Garber, U.S. Food and Drug Administration, College Park, MD, USA

P1-224 Growth Temperature and Salt Affect Thermal Resistance of Potential Hepatitis A Virus Surrogates *Staphylococcus carnosus* CS 299 and CS 300 — MAYURI PATWARDHAN, Doris D'Souza, University of Tennessee, Knoxville, TN, USA

P1-225 Antibiotic Resistance Profiles and Detection of Enterotoxin Genes in *Staphylococcus epidermidis* Isolates from Pork Production — HAENG HO LEE, Gi-Yong Lee, Hong Sik Eom, Soo-Jin Yang, Chung-Ang University, Anseong, South Korea

P1-226 Wide Host Range Phages of the Genus *FelixO1virus* are Potential Candidates for *Salmonella* Infantis Biocontrol — Dacil Rivera, Lauren Hudson, Thomas G. Denes, ANDREA MORENO-SWITT, Universidad Andres Bello, Santiago, Chile

P1-227 Determinants of Specificity of the *Escherichia coli* O157:H7 Bacteriophage PhiV10 — MICHAEL OATS, Luca Rotundo, Claudia Coronel, Carla Rosenfield, Trevor Lim, Andrew Kanach, George Paoli, Andrew Gehring, Arun Bhunia, Bruce Applegate, Purdue University, West Lafayette, IN, USA

General Microbiology

P1-228 Population Dynamics of *Listeria monocytogenes* during Rehydration of Dehydrated Potato — VIDYA NATARAJAN, Joelle K. Salazar, Girvin Liggans, Mary Lou Tortorello, U.S. Food and Drug Administration, Bedford Park, IL, USA

P1-229 Glove-mediated Transfer of *Listeria monocytogenes* on Fresh-cut Cantaloupes — YAN QI, Yingshu He, Wei Zhang, Xiangyu Deng, University of Georgia, Center for Food Safety, Griffin, GA, USA

P1-230 Growth of *E. coli* and *Salmonella* spp. at Low pH and Temperature Levels — PAMELA MCKELVEY, Andrew Scollon, Gina Masanz, Daniel Belina, Land O'Lakes, Inc., St. Paul, MN, USA

P1-231 Photocatalytically Enhanced Inactivation of Internalized *Salmonella* Typhimurium and *E. coli* in Fresh Lettuce Using UV with TiO_2 — SEUNGJUN LEE, Chulkyoon Mok, Jiyoung Lee, The Ohio State University, Columbus, OH, USA

P1-232 Isolation and Molecular Characterization of Shiga Toxin-producing *Escherichia coli* from Food and Clinical Samples — ASHRAF KHAN, Khulud Alotaibi, Division of Microbiology, Regulatory Compliance and Risk Management National Center for Toxicological Research, U.S. Food and Drug Administration, Jefferson, AR, USA

P1-233 Thermal Inactivation of Extraintestinal Pathogenic *Escherichia coli* Suspended in Ground Chicken Meat and the Effect of Virulence and Antibiotic Resistance Factors — AIXIA XU, Shiowshuh Sheen, James Johnson, Christopher Sommers, University of Maryland, Department of Nutrition and Food Science, College Park, MD, USA

P1-234 Inactivation of *Klebsiella pneumoniae* in Ground Chicken Meat by High-pressure Processing, Gamma Radiation, and Thermal Processing — AIXIA XU, Shiowshuh Sheen, Christopher Sommers, University of Maryland, Department of Nutrition and Food Science, College Park, MD, USA

P1-235 Characterizing the Microbiome of Recycled Bedding, the Environmental Persistence of *Salmonella enterica,* and the Implications for Preharvest Bovine Health — HANNAH PILCH, Charles Czuprynski, Garret Suen, Nicole Aulik, Donald Sockett, University of Wisconsin-Madison, Department of Pathobiological Sciences, Madison, WI, USA

P1-236 Antibiotic Resistance of Lactic Acid Bacteria Isolated from Dairy Products in Tianjin, China — KAIDI WANG, Hongwei Zhang, Jinsong Feng, Shenmiao Li, Xiaonan Lu, Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, BC, Canada

P1-237 *Salmonella* Detection from Large Milk Powder Samples Using the Thermo Scientific Suretect *Salmonella* Species PCR Assay — Charlotte Cooper, Katharine Evans, David Crabtree, Annette Hughes, Dean Leak, Agata Dziegiel, AMANDA MANOLIS, Thermo Fisher Scientific, Austin, TX, USA

P1-238 Food Authenticity Testing with Next-Generation Sequencing — Tiina Karla, Nicole Prentice, AMANDA MANOLIS, Thermo Fisher Scientific, Austin, TX, USA

P1-239 Isolation and Genome Analysis of *Lactococcus lactis* Strains Characterized for the Potential Utilization of Allulose — Chang Joo Lee, HYUN-JOONG KIM, Kyung Hee University, Yongin, South Korea

P1-240 Modulation of Gut Intestinal Microbiota during Prevention of Salmonellosis with *Lactobacillus* in BALB/cJ Mice — MENGFEI PENG, Jianghong Meng, Debabrata Biswas, University of Maryland, College Park, MD, USA

P1-241 Real-time PCR Assay for the Simultaneous Detection of *Lactobacillus* Species by Comparative Genome Analysis — EISEUL KIM, Hae-Yeong Kim, Kyung Hee University, Yongin, South Korea

P1-242 Comparison of Gastrointestinal Tolerance and Antimicrobial Effects of Probiotic Bacteria Isolated from Dietary Supplements — PIN-WEN WANG, W.T. Evert Ting, Purdue University Northwest, Hammond, IN, USA

P1-243 Protective Effects of β-Glucan Extracted from Spent Brewer's Yeast during Freeze-drying and Storage of Probiotic Lactobacilli — Jéssica da Silva Guedes, Tatiana Colombo Pimentel, Evandro L. de Souza, Estefânia Fernandes Garcia, MARCIANE MAGNANI, Federal University of Paraiba, João Pessoa, Brazil

Blue Text – Developing Scientist Competitor

Green Text - Undergraduate Student Competitor

P1-244 Functional Properties and Safety Assessments of *Lactobacillus* Strains Isolated from Selected Traditional Fermented Food Products in Nigeria — KOLAWOLE BANWO, Abiodun Sanni, Department of Microbiology, University of Ibadan, Ibadan, Nigeria

P1-245 Prevalence of Extended Spectrum β-Lactamase *Escherichia coli*, *Enterococcus* spp. and *Salmonella* in Soil and Water after Hurricane Florence Flooding in North Carolina — SHIVARAMU KEELARA, Paula J. Fedorka-Cray, Shivasharanappa Nayakvadi, Nigatu Atlaw, Department of Population Health and Pathobiology, CVM, NCSU, Raleigh, NC, USA

P1-246 Microbial Quality and Safety of Pesto, Salsa, Guacamole and Tapenades at Retail Markets — TESSA TUYTSCHAEVER, Mieke Uyttendaele, Liesbeth Jacxsens, Ghent University, Ghent, Belgium

P1-247 Thermal Reduction of *Salmonella* Inoculated Gelatin in Marshmallow — JENNIFER TODD-SEARLE, Danielle Voss, Bartosz Kielczewski, Kelly Poltrok-Germain, Nancy Bontempo, Mondelez International, East Hanover, NJ, USA

P1-248 Lethality of *Salmonella* spp., *Escherichia coli*, and *Listeria monocytogenes* during BBQ Sauce Processing — MAURISA MANSARAY, Ashley Cunningham, Stephanie Nguyen, Christopher Showalter, Deann Akins-Lewenthal, Conagra Brands, Omaha, NE, USA

P1-249 Quantitative Microbial Risk Assessment of *Vibrio cholerae* and *Vibrio vulnificus* by Consumption of Flatfish Sushi and Sashimi — SEJEONG KIM, Yoonjeong Yoo, Young-Mog Kim, Kwon-Sam Park, Il Shik Shin, Yohan Yoon, Risk Analysis Research Center, Sookmyung Women's University, Seoul, South Korea

P1-250 Enhancement of Thermal Inactivation of Foodborne Pathogenic Bacteria at Mild Heating Temperatures with Inclusion of Parabens — ZHUJUN GAO, Qiao Ding, Chongtao Ge, Rohan Tikekar, Robert Buchanan, University of Maryland, College Park, MD, USA

P1-251 Validation of a Drum Roaster for Peanut Roasting in a Jhagadia, Gujarat (India) Peanut Butter Facility — NANCY DOBMEIER, Balasubrahmanyam Kottapalli, Conagra Brands, Omaha, NE, USA

P1-252 Validation of Baking as a Kill-Step for Controlling *Salmonella* in Fruit Filled Pastry — Minto Michael, Daniel Vega, LAKSHMIKANTHA CHANNNAIAH, George Milliken, Harshavardhan Thippareddi, Nicholas Sevart, Randall Phebus, AIB International, Manhattan, KS, USA

P1-253 Isolation and Characterization of a Novel *Salmonella* Bacteriophage from Livestock Farms in Ohio — YUE YI, Ahmed Yousef, Ohio State University, Columbus, OH, USA

P1-254 Stress Response and Survival of *Salmonella* Enteritidis in Single and Dual Species Biofilms with *Pseudomonas fluorescens* Following Repeated Exposure to Quaternary Ammonium Compounds — Xinyi Pang, HYUN-GYUN YUK, Korea National University of Transportation, Jeungpyeong-gun, South Korea

P1-255 Biofilm Formation of O157 and Non-O157 Wild-Type and Pressure-stressed Shiga Toxin-producing *Escherichia coli* at 7°C and 25°C and Their Sensitivity to Quaternary Ammonium Compound-based Sanitizer — MONICA HENRY, Abimbola Allison, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P1-256 Phenotypic Characterization of Biofilm-forming *Bacillus* spp. Identified in the Irish Artisan Bakery Environment — SAKSHI LAMBA, MM Dechamma, Séamus Fanning, Amalia G.M. Scannell, UCD Centre for Food Safety, UCD Institute of Food and Health, UCD School of Agriculture and Food Science, University College Dublin, Dublin, Ireland

P1-257 Antimicrobial Resistance of Enterococci in Surface and Reclaimed Water in the Mid-Atlantic Region — Rebecca Patterson, SULTANA SOLAIMAN, Shirley A. Micallef, University of Maryland, College Park, MD, USA

P1-258 Distribution of Pathogenic *E. coli* in Surface and Reclaimed Water: A Conserve Study — SULTANA SOLAIMAN, Mary Theresa Callahan, Eric Handy, Cheryl East, Sarah Allard, Rianna Murray, Anthony Bui, Joseph Haymaker, Chanelle White, Shani Craighead, Brienna Anderson, Adam Vanore, Samantha Gartley, Salina Parveen, Fawzy Hashem, Eric May, Kali Kniel, Manan Sharma, Amy Sap, University of Maryland, College Park, MD, USA

P1-259 Prevalence of Methicillin-resistant *Staphylococcus aureus* in the Isidro Ayora General Hospital in the City of Loja, Ecuador — ELIANA BACULIMA, Diana Hualpa, Andres Cabrera, Fernando Serrano, Universidad Técnica Particular de Loja, Loja, Ecuador

P1-260 A Comparison Study of bioMérieux VIDAS SET II and the r-Biopharm Ridascreen SET Total to Detect the Presence of Staphylococcal Enterotoxins Using Matrix Dependent Extractions from a Variety of Foods — ASHLEY AURAND-CRAVENS, Beth Johnson, Vaneet Arora, Patricia Rule, Stan Bailey, KY Department of Public Health Division of Laboratory Services, Frankfort, KY, USA

P1-261 Hurdle Enhancement of Antimicrobial Efficacy of Acidic Electrolyzed Water on *Bacillus cereus* Spores Using Ultrasonication — RUILING LV, Donghong Liu, Xiaonan Lu, Zhejiang University, Hangzhou, China

P1-262 Isolation and Characterization of *Vibrio parahaemolyticus* Protected from Laboratory Validation from Natural Seafood Sources — KAYLA WALKER, Guadalupe Meza, Hung Tiong, University of West Alabama, Livingston, AL, USA

P1-263 The Migration of Phthalate Esters from Packaging Materials to Olive Oil under High Temperate Storage — Hua-Ru Su, Cheng-i Wei, TAI-YUAN CHEN, National Taiwan Ocean University, Keelung, Taiwan

P1-264 Withdrawn

P1-265 Insight into Bacterial Communities Present in Commercial Chopped Romaine Lettuce Processed in Early and Late Seasons — CHAO LIAO, Luxin Wang, Auburn University, Auburn, AL, USA

P1-266 Analyzing Microbial Community Change of Turkey Litter Compost Due to Heat Exposure Using 16S High Throughput Sequencing — HONGYE WANG, Vijay Shankar, Muthu Dharmasena, Xiuping Jiang, Clemson University, Clemson, SC, USA

P1-267 Development of an Olfactory Test as a Tool for Food Safety — TEIK-YING NG, Chih-Jaan Tai, Li-Tai Tsai, Hsiu-Chun Chen, Shih-Chieh Liao, Ming-Hsui Tsai, China Medical University Hospital, Taichung, Taiwan

P1-268 Growth Profile of Bacteria, Molds and Yeasts in Sliced Mozzarella Cheese Stored under Refrigeration — RENATA RODRIGUES DOS SANTOS, Rafael da Silva de Souza, Ilana Racowski, Termomecanica Technology College, São Bernardo do Campo, Brazil

P1-269 Acidified Sushi Rice Safety — ZAHRA MOHAMMAD, Larry Payton, Sujata A. Sirsat, University of Houston, Houston, TX, USA

P1-270 Assessment of Mercury Contamination in Sardine and Swordfish Using Inductively Coupled Plasma Atomic Emission Spectroscopy — LEILA BOUAYAD, Fetta Mehouel, Radia Bouhamed, Rachid Achek, Taha Mossadak Hamdi, Laboratory of Food Hygiene and Quality Insurance System (HASAQ), High National Veterinary School, Algiers, Algeria

P1-271 Development of a New and Natural Food Colorant Type Time-Temperature Indicator — Yi-Chen Lee, Chung-Saint Lin, Kune-Muh Tsai, Rong-Hsien Lin, Siang-Mei Zeng, YUNG-HSIANG TSAI, National Kaohsiung University of Science and Technology, Kaohsiung City, Taiwan

P1-272 Food Contamination Incidence by Foreign Materials Reported in Japan, 2014 to 2016 — KUNIHIRO KUBOTA, Masaru Tamura, Yuko Kumagai, Masanori Imagawa, Sachie Nakaji, Yoshinori Mizoguchi, Hiroshi Amanuma, National Institute of Health Sciences, Kawasaki, Japan

P1-273 Estimating the Burden of Foodborne Illness for *Campylobacter*, *Salmonella* and *Vibrio parahaemolyticus* in Japan from 2006 to 2016 — KUNIHIRO KUBOTA, Hiroshi Amanuma, Masaru Tamura, Kiyoko Tamai, Masahiro Shimojima, Shunsuke Shibuya, Yoshiharu Sakurai, Mayumi Komatsu, Fumiko Kasuga, National Institute of Health Sciences, Kawasaki, Japan

P1-274 Occupational and Food Safety Risks among Slaughterhouse Workers in Ilorin, North Central Nigeria — ISMAIL ODETOKUN, Ibraheem Ghali-Mohammed, Nma Alhaji, Aliyu Nuhu, Habeeb Oyedele, Saliu Ameen, Victoria Adetunji, University of Ilorin, Department of Veterinary Public Health and Preventive Medicine, Ilorin, Nigeria

P1-275 Evaluation of HACCP Implementation in Food Manufacturing Companies in the Emirates of Dubai — ABDUL AZEEZ MULLATTU EBRAHIM, M R S International Food Consultants, Dubai, United Arab Emirates

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P1-276 Effects of Food Safety Training on Achieving Food Safety Knowledge and Practices in Restaurants in the Emirates of Dubai — ABDUL AZEEZ MULLATTU EBRAHIM, M R S International Food Consultants, Dubai, United Arab Emirates

P1-277 Occurrence of *Campylobacter jejuni and Campylobacter coli* in Chilled Poultry Carcasses in Algeria — RADIA BOUHAMED, Leila Bouayad, Rachid Achek, Cemil Kurekci, Taha Mossadak Hamdi, Laboratory of Food Hygiene and Quality Insurance System (HASAQ), High National Veterinary School, Algiers, Algeria

P1-278 Transcriptomic Analysis of Botulinum Neurotoxin Expression in *Clostridium botulinum* Strain 62A in Culture Media Using RNA Sequencing — KRISTIN M. SCHILL, Yan Qi, Shaoting Li, Xiangyu Deng, Yun Wang, N. Rukma Reddy, Travis Morrissey, U.S. Food and Drug Administration, Bedford Park, IL, USA

P1-279 Fate of *Listeria monocytogenes* in Frozen Strawberries — Melanie Butler, Thomas Hammack, Dumitru Macarisin, Jianghong Meng, YI CHEN, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

P1-280 Effect of Growth Conditions on Desiccation Tolerance in *Salmonella enterica, Escherichia coli*, and *Listeria monocytogenes* — RACHEL STREUFERT, Susanne Keller, Nathan Anderson, Elizabeth Grasso-Kelley, U.S. Food and Drug Administration, Bedford Park, IL, USA

P1-281 Applications of DNA Sequencing in Food Microbiology: Looking Beyond Outbreak Investigations — MEGAN S. BROWN, J. David Legan, Eurofins Microbiology Laboratories, Madison, WI, USA

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TUESDAY POSTERS
8:30 AM – 6:15 PM

P2 POSTER SESSION 2

Antimicrobials
Dairy
Pre-harvest Food Safety
Produce
Sanitation and Hygiene
Viruses and Parasites

Kentucky International Convention Center, Exhibit Hall

P2-01 through P2-141 – Authors present 10:00 a.m.– 11:30 a.m. and 5:15 p.m. – 6:15 p.m.

P2-142 through P2-262 – Authors present 2:15 p.m. – 3:45 p.m. and 5:15 p.m. – 6:15 p.m.

Antimicrobials

P2-01 Polyphenolic Compounds Kill *Escherichia coli* or Affect Growth, Swarming Motility and Virulence Gene Expression at Sublethal Concentrations — Jorge Dávila-Aviña, Carolina Gil, Santos Garcia, NORMA HEREDIA, Departamento de Microbiología e Inmunología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, San Nicolas, Mexico

P2-02 Differential Antimicrobial Activity of Thymol and Oregano Oil against *Listeria monocytogenes* Strains — Maria Grazia Cusimano, Domenico Schillaci, Maria La Giglia, Vincenzo Arizza, Ilenia Calabrò, Vincenzo Di Marco Lo Presti, MARIA VITALE, Istituto Zooprofilattico Sperimentale of Sicily, Palermo, Italy

P2-03 Antimicrobial Activity of *Rosemary officinalis* Leaves against Foodborne Pathogens and Application as a Natural Disinfectant on Food Contact Surfaces — KYUNG MIN PARK, Minseon Koo, Hyun Jung Kim, Sung geon Yoon, Jin-Yong Kim, Tae Mi Yoon, Tae Ho Choi, University of Science and Technology, Daejoen, South Korea

P2-04 Dried Spices and Their Role in Final Product Quality – A Case Study — JACK MOURADIAN, Shelly Gebert, Matt Hundt, Third Wave Bioactives, Wauwatosa, WI, USA

P2-05 Identification of Nonpathogenic Surrogate Bacteria Applicable for Industrial-Scale Gaseous Chlorine Dioxide Treatment on Baby Carrots — JIEWEN GUAN, Juming Tang, Alison Lacombe, David F. Bridges, Bhargavi Rane, Shyam Sablani, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P2-06 Phenolic Extracts of Chokeberry Pomace Have Inhibitory Effects on *E. coli* O157:H7 But Not on Probiotic Bacteria and Normal Bacterial Flora — ARPITA ADITYA, Zabdiel Alvarado Martinez, Mengfei Peng, Debabrata Biswas, University of Maryland, College Park, MD, USA

P2-07 Assessing Bacterial Viability by Monitoring Adenine Nucleotides and Adenylate Charge in Response to Biocide Treatment — SAID GOUELI, Subhanjan Mondal, Kevin Hsiao, Promega Corp., Madison, WI, USA

P2-08 Fermentation Optimization to Maximize Production of Scarcely Produced Paenibacillin by *Paenibacillus polymyxa* OSY-EC — EMILY CAMPBELL, Ren Pengkang, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

P2-09 Synergistic Antimicrobial Effects of Metal Oxide Nanoparticles and Ajoene against *Campylobacter jejuni* — SHENMIAO LI, Jinsong Feng, Xiaonan Lu, Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, BC, Canada

P2-10 Evaluation of Bactericidal Effects of Phenyllactic Acid on Shiga Toxin-producing *E. coli* in Beef Products — Ruisheng Zheng, TONG ZHAO, Koushik Adhikari, Yen-Con Hung, University of Georgia, Griffin, GA, USA

P2-11 Synergistic Antimicrobial Activities of Gaseous Essential Oils against *Bacillus cereus* Vegetative Cells and Spores on a Laboratory Medium — YURIM CHO, Jeongmin Lee, Jee-Hoon Ryu, Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, South Korea

P2-12 Withdrawn

P2-13 Assessing the Efficacy of Sodium Bisulfate in Tempering Water to Control Shiga Toxin-producing *Escherichia coli* in Wheat — AISWARIYA DELIEPHAN, Janak Dhakal, Charles Aldrich, Kansas State University, Manhattan, KS, USA

P2-14 Screening Cultures for Nitrate Reduction and Their Use in the Fermentation of Vegetable Extracts to Generate 'Natural Nitrite', a Clean Label Ingredient — ARJUN BHUSAL, Peter Muriana, Oklahoma State University, Stillwater, OK, USA

P2-15 *Listeria monocytogenes* Control in Cold Smoked Salmon Using Natural and Sodium-free Preservatives — EELCO HEINTZ, Paw Dalgaard, Henkjan van Lent, Michael Eliasen, Leonardo Vega, Niacet, Tiel, The Netherlands

P2-16 Antimicrobial Activity of Different Cabbages Based on In Vitro and In Silico Methods — Ramachandran Chelliah, Kandasamy Saravanakumar, MOMNA RUBAB, Deog-Hwan Oh, Kangwon National University, Chuncheon, South Korea

P2-17 Physiological Damages Caused to Cells of *Salmonella* Enteritidis PT4 by Continuous Exposure to Mint (*Mentha piperita L.*) Essential Oil — Adma Nadja Ferreira de Melo, Geany Targino de Souza Pedrosa, Erika Tayse da Cruz Almeida, Evandro L. de Souza, Donald W. Schaffner, MARCIANE MAGNANI, Federal University of Paraiba, João Pessoa, Brazil

P2-18 Cell Damage Caused by Mandarin Essential Oil to Autochthonous Spoilage Lactic Acid Bacteria in Orange Juice — Geany Targino de Souza Pedrosa, Adma Nadja Ferreira de Melo, Erika Tayse da Cruz Almeida, Evandro L. de Souza, Rafael Pagan, MARCIANE MAGNANI, Federal University of Paraiba, João Pessoa, Brazil

P2-19 Antimicrobial Resistance of *Salmonella* Recovered from Environmental Samples on Three North Carolina Tomato Farms — ROBIN GRANT MOORE, Diane Ducharme, Otto Simmons, Kellie P. Burris, Lee-Ann Jaykus, Jie Zheng, Eric Brown, Rebecca L. Bell, North Carolina State University, Raleigh, NC, USA

P2-20 Assessment of Antibiotic Usage and Oxytetracycline Residues in Eggs from Commercial Poultry Farms in Ilorin, Nigeria — IBRAHEEM GHALI-MOHAMMED, Ismail Odetokun, Shukurat Omotayo Ghali, Ismail Adewuyi Adeyemo, Isaac Olufemi Olatoye, University of Ilorin, Department of Veterinary Public Health and Preventive Medicine, Ilorin, Nigeria

P2-21 Effect of Nutrient Enrichment on Antimicrobial-resistance Dynamics of Native Soil Bacteria — TERRANCE ARTHUR, Amit Vikram, Eric Miller, Getahun Agga, John Schmidt, U.S. Department of Agriculture – ARS, U.S. Meat Animal Research Center, Clay Center, NE, USA

P2-22 Influence of pH on the Effectiveness of a Natural Antimicrobial to Control *Listeria monocytogenes* on Ready-to-Eat, Clean Label, Smoked Pork Sausage during Extended Storage at 4° and 10°C — JOHN LUCHANSKY, Stephen Campano, Paul Hargarten, Trevor Schueler, Corey Janquart, Bradley Shoyer, Laura Shane, Elizabeth Henry, Manuela Osoria, Anna Porto-Fett, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P2-23 Investigation into the Detection of Semicarbzide, a Nitrofurazone Indicator, in Chicken — RANDOLPH DUVERNA, Rita Kishore, John Johnston, John Jarosh, Catalina Yee, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

P2-24 Survival and Inactivation of *Listeria monocytogenes* from Common Specialty Crop Food Contact and Non-Food Contact Surfaces Using Different Antimicrobials — Trevor Suslow, ADRIAN SBODIO, Janneth Pinzon, David Hill, Mariya Skots, University of California-Davis, Davis, CA, USA

P2-25 Susceptibility of *Listeria monocytogenes* Isolates from Food, Environmental, and Clinical Origin in South Africa against a Commercial Bacteriophage — ROCHELLE KEET, Diane Rip, Stellenbosch University, Stellenbosch, South Africa

P2-26 Antimicrobial Effect of Citral-based Emulsions against *Escherichia coli* (MTCC 443) on Fresh-cut Papaya Surface — Irshaan Syed, Preetam Sarkar, PRATIK BANERJEE, University of Memphis, Memphis, TN, USA

P2-27 The Effect of Cranberry Pomace Ethanol Extract on the Growth of Meat Starter Cultures, *Escherichia coli* O157:H7, *Salmonella* Enteritidis, and *Listeria monocytogenes* — TSUN YIN ALEX LAU, Shai Barbut, S. Balamurugan, University of Guelph, Guelph, ON, Canada

P2-28 Evaluation of Maqui (*Aristotelia chilensis)* extract and Copper against Biofilm Production in *Listeria monocytogenes* — Ana Maria Quesille-Villalobos, Patricia Madrid, Patricia Gallardo, Leonardo Vasquez, Magaly Toro, ANGELICA REYES-JARA, INTA, Universidad de Chile, Santiago, Chile

P2-29 Antimicrobial and Physical Properties of Chitosan/Acetylated Starch Edible Films Containing Cinnamon and Clove Essential Oils — KAI WEN CHOO, Wei Wang, Azlin Mustapha, University of Missouri, Columbia, MO, USA

P2-30 Evaluation of Two Antimicrobial Treatments, Chlorine and Peroxyacetic Acid, to Effectively Control *Listeria monocytogenes, Salmonella* spp., and *Escherichia coli* O157:H7 on Celery Stalks — PETER NIELSEN, Gary Wruble, Alliance Analytical Laboratories Inc., Coopersville, MI, USA

P2-31 Influence of Pre-adaptation to Sub-lethal Concentrations of a Sanitizer on the Susceptibility of Fecal Coliforms to Antibiotics — HIMABINDU GAZULA, Jinru Chen, Department of Food Science and Technology, The University of Georgia, Griffin, GA, USA

P2-32 Bacterial Contamination of Touch Screens in Restaurants and Grocery Stores — CHARLES GERBA, Luisa Ikner, Derek Lopez, James Arbogast, University of Arizona, Tucson, AZ, USA

P2-33 Potential Application of the Photosensitizer Curcumin in Inactivating Foodborne Pathogens on Chicken — JINGWEN GAO, Karl Matthews, Rutgers University, New Brunswick, NJ, USA

P2-34 How Water Antimicrobials and Produce Volume Influence Cross-Contamination during Batch Washing in Retail Operations — Hyein Jang, JINGWEN GAO, Licheng Huang, Karl Matthews, Rutgers University, New Brunswick, NJ, USA

P2-35 Identifying Nonpathogenic *Salmonella* Surrogates for Industrial Scale Treatment of Almonds Using Gaseous Chlorine Dioxide — BHARGAVI RANE, Alison Lacombe, Shyam Sablani, David F. Bridges, Juming Tang, Jiewen Guan, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P2-36 Efficacy of Cinnamon Oil Nanoemulsion in Inhibiting *Salmonella* spp. and *Listeria* spp. on Mung Bean Sprouts — ELAINE SAWYER, Hari Kotturi, Kanika Bhargava, University of Central Oklahoma, Edmond, OK, USA

P2-37 Evaluation of Cranberry Antimicrobial Properties by TLC-Bioautography — CHAYAPA TECHATHUVANAN, Yu-Ting Hung, Christopher McNamara, Margarita Gomez, Ocean Spray Cranberries, Inc., Lakeville-Middleboro, MA, USA

P2-38 Long-term Survival Phase Cells of *Listeria monocytogenes* Exhibit Increased Tolerance to Cinnamaldehyde in 0.85% Saline and Apple Juice — SAMUEL KIPROTICH, Iowa State University, Ames, IA, USA

P2-39 Comparison of a Novel Lactic Acid-based Antimicrobial Solution (Purac Evolve) to Lactic Acid and Water as a Final Pre-Rigor Beef Carcass Wash to Reduce Shiga Toxin-producing *Escherichia coli* Contamination — SAURABH KUMAR, Nicholas Sevart, Daniel Vega, Randall Phebus, Kansas State University, Manhattan, KS, USA

P2-40 Isolation of Antimicrobial- and Lactase-producing Lactic Acid Bacteria from Farm Animals and Produce — ERICA JOHNSON, Guadalupe Meza, Hung Tiong, University of West Alabama, Livingston, AL, USA

P2-41 Implementation of Fluorescent Assays to Measure Membrane Damage to *Escherichia coli* O157:H7 after Exposure to Chlorine Dioxide — DAVID F. BRIDGES, Alison Lacombe, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P2-42 The Use of *Bacillus* spp. Isolated from Ready-to-Eat Date Fruits to Control *Listeria monocytogenes* — KRISHNA S. GELDA, Valeria R. Parreira, Gisèle LaPointe, Jeffrey Farber, University of Guelph, CRIFS, Department of Food Science, Guelph, ON, Canada

P2-43 Sanitizer Susceptibility of Recurrent and Sporadic *Listeria monocytogenes* from Meat Processing Environments When Grown in Planktonic and Biofilm States — JOVANA KOVACEVIC, Deana Rolheiser, Valerie Bohaychuk, Lynn McMullen, Oregon State University, Portland, OR, USA

P2-44 The Use of Flow Cytometry for the Rapid Detection of Fluorescent-tagged *Salmonella* spp. in Food and Environmental Samples — MEGAN S. BROWN, Andrzej A. Benkowski, J. David Legan, Eurofins Microbiology Laboratories, Madison, WI, USA

P2-45 Tracing Contamination Issues and Challenges with *Listeria* spp. in an Artisan Dairy Plant in British Columbia, Canada Over a Nineteen-year Period — JOVANA KOVACEVIC, Lorraine McIntyre, Sion Shyng, Oregon State University, Portland, OR, USA

P2-46 Efficacy of a Food Acid to Inhibit *Escherichia coli* O157:H7 and Disrupt Its Biofilms on High Density Polyethylene Surface — LAUREN NADEN, Joshua Payne, Carl Knueven, Tony Kountoupis, Divya Jaroni, Oklahoma State University, Stillwater, OK, USA

P2-47 Validation of the USDA Official Method Neutralization Step/Buffer for a Novel Antimicrobial Solution of Five Percent Lactic Acid Plus Surfactants — Daniel Unruh, SARA LASUER, Garrett McCoy, Robert Ames, Saurabh Kumar, Corbion, Lenexa, KS, USA

P2-48 Antimicrobial Properties of Ohelo Berry (*Vaccinium reticulatum*) Fractions: Anthocyanins, Non-Anthocyanin Phenolics, and Organic Acids — XIAOHAN LIU, Stuart Nakamoto, Yong Li, University of Hawaii at Manoa, Honolulu, HI, USA

P2-49 Comparison of the Antimicrobial Activities of *Ohelo* Berry (*Vaccinium reticulatum*) and Cranberry (*Vaccinium macrocarpon*) — XIAOHAN LIU, Stuart Nakamoto, Yong Li, University of Hawaii at Manoa, Honolulu, HI, USA

P2-50 Effects of Sodium Lactate on the Growth of *Bacillus cereus* in a Rice-based Model Food — Jing Ni Tan, CHENG-AN HWANG, Lihan Huang, Hsin-I Hsiao, Eastern Regional Research Center, Agricultural Research Service, USDA, Wyndmoor, PA, USA

P2-51 Discovery of Novel Small Molecules, Metabolites and Probiotic Strains from Plant Ecosystems to Control Foodborne Pathogens — BOWORNNAN CHANTAPAKUL, Valeria R. Parreira, Manish N. Raizada, Jeffrey Farber, University of Guelph, CRIFS, Department of Food Science, Guelph, ON, Canada

P2-52 Effect of Gallic Acid and Protocatechuic Acid on *Salmonella* Typhimurium — ZABDIEL ALVARADO-MARTINEZ, Debabrata Biswas, University of Maryland, College Park, MD, USA

P2-53 Validation of Vinegar Powder to Control *Listeria monocytogenes*, *Salmonella enterica*, Shiga Toxin-producing *Escherichia coli*, and Lactic Acid Bacteria in Fresh Chicken Salad — DANIEL UNRUH, Sara LaSuer, Garrett McCoy, Thomas Rourke, Saurabh Kumar, Corbion, Lenexa, KS, USA

P2-54 Assessment of Five Percent Lactic Acid Plus Surfactants and Ten Percent Lactic Acid Antimicrobial Interventions for Spoilage Microorganism Growth and Survival on Beef Tissues — DANIEL UNRUH, Sara LaSuer, Garrett McCoy, Audrey Boeken, Robert Ames, Saurabh Kumar, Corbion, Lenexa, KS, USA

P2-55 Optimization of the Functionality of Sanitizers and Nisin Using Response Surface Methodology: Control of *E. coli* O157:H7 ATCC 43888 and *L. monocytogenes* ATCC 7644 Biofilm — STANLEY DULA, Oluwatosin Ademola Ijabadeniyi, Durban University of Technology, Durban, South Africa

P2-56 Purification and Structural Elucidation of Paraplantaricin TC318, a Novel Natural Antimicrobial Food Preservative Produced by *Lactobacillus paraplantarum* — WALAA HUSSEIN, En Huang, Ismet Ozturk, Xu Yang, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

P2-57 Assessment of Probiotic Traits, Antimicrobial Characteristics and Safety of *Enterococcus durans* Osy-Egy Isolated from Artisanal Hard Cheese — WALAA HUSSEIN, Ahmed Abdelhamid, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

P2-58 Effect of Heat (Cooking) on the Concentration of Gentamicin Residue in Chicken — EKENE EZENDUKA, Chika Onyeanu, Aruh Anaga, John Nwanta, University of Nigeria, Nsukka, Nsukka, Nigeria

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P2-59 Interactions of Carvacrol, Caprylic Acid, Habituation, and Mild Heat for Pressure-based Inactivation of O157 and Non-O157 Serogroups of Shiga Toxin-producing *Escherichia coli* in Low-Acid Environments — NIAMUL KABIR, Sadiye Aras, Shahid Chowdhury, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P2-60 Synergism of Mild Heat, Nisin, and Elevated Hydrostatic Pressure for Inactivation of *Listeria monocytogenes* — SADIYE ARAS, Niamul Kabir, Jayashan Adhikari, Shahid Chowdhury, Aliyar Fouladkhah, Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN, USA

P2-61 Reproducible Inactivation of *Staphylococcus aureus* on a Surface Using UV LED — THERESA THOMPSON, Garth Eliason, Jay Pasquantonio, Phoseon Technology, Hillsboro, OR, USA

P2-62 Development a Pilot Plasma Device to Inactivate *Salmonella* spp. on Shell Eggs — CHIA-MIN LIN, Chih-Yao Hou, Yen-Chuan Chiu, Shih-Ming Syu, National Kaohsiung University of Science and Technology (NKUST), Kaohsiung, Taiwan

P2-63 Heat Resistance of *Clostridium perfringens* Vegetative Cells in *Sous Vide* Processed Ground Beef Supplemented with Grape Seed Extract — Serap Cosansu, VIJAY JUNEJA, Marangeli Osoria, Sudarsan Mukhopadhyay, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P2-64 Use of Pathogen-specific Bacteriophages to Reduce the Viability of *Escherichia coli* O157:H7 on Fresh Produce — BADRINATH VENGARAI JAGANNATHAN, Melissa Morgan, Paul Priyesh Vijayakumar, University of Kentucky, Lexington, KY, USA

P2-65 Cross-resistance to Phage Infection in *Listeria monocytogenes* Serotype ½ a — DANIELLE TRUDELLE, Daniel Bryan, Thomas G. Denes, The University of Tennessee, Knoxville, TN, USA

P2-66 Antibiotic Resistance Phenotyping and Genotyping of Verocytotoxigenic *Escherichia coli* Isolated from Irrigation Water in British Columbia, Canada and Their Susceptibility to Bacteriophages — YVONNE MA, Siyun Wang, Food, Nutrition and Health, University of British Columbia, Vancouver, BC, Canada

P2-67 Evaluation of Individual and Cocktails of Bacteriophages against Shiga Toxin-producing *Escherichia coli* and Their Biofilms — PABASARA WEERARATHNE, Tony Kountoupis, Pushpinder Kaur Litt, Divya Jaroni, Oklahoma State University, Stillwater, OK, USA

P2-68 Reduction of *Aeromonas hydrophila* Contamination on Lettuce by Using a Novel *Aeromonas hydrophila*-specific Phage — YEON SOO KIM, Damilare Adeyemi, In Young Choi, Mi-Kyung Park, School of Food Science and Biotechnology, Kyungpook National University, Daegu, South Korea

P2-69 Characterization of a Novel Bacteriophage, EscoHU1, Infecting Both *Escherichia coli* O157:H7 and *Salmonella* — SHOGO YAMAKI, Yuji Kawai, Koji Yamazaki, Hokkaido University, Hakodate, Japan

P2-70 Genomic Characterization of *Salmonella*-infecting Bacteriophages Isolated from British Columbia, Canada — KAREN FONG, Denise Tremblay, Sylvain Moineau, Siyun Wang, Food, Nutrition and Health, University of British Columbia, Vancouver, BC, Canada

P2-71 Efficiency of a Phage Intervention against *Salmonella* on Lean Pork, Pork Trim and Bacon — SONALI SIRDESAI, Giovanni Eraclio, Robin Peterson, Steven Hagens, Joël van Mierlo, Bert de Vegt, Micreos Food Safety B.V., Wageningen, The Netherlands

P2-72 Characterization of Selected β-Lactam-resistant *Escherichia coli* Isolates from Food Products — XINHUI LI, Carmen Radeke, Collin Grota, Mackenzie Johnson, Emma Freeman, University of Wisconsin-La Crosse, La Crosse, WI, USA

P2-73 Molecular Epidemiology and Antibiotic Resistance of *Staphylococcus aureus* from Food Animal Carcasses and Carcass Handlers in Nigeria — ONYINYE OKORIE-KANU, Kennedy Chah, Dipendra Thapaliya, Ekene Ezenduka, Madubuike Anyanwu, Christain Okorie-Kanu, Anthony Mgbeahuruike, John Nwanta, Toochukwu Ejiofor, Tara Smith, Gracen Gerbig, University of Nigeria, Nsukka, Nigeria

P2-74 The Antimicrobial Activities of Beef Fatty Acids and Their Effects on Virulence Gene Expression in *Listeria monocytogenes* and *Salmonella* Typhimurium — YUAN YAO CHEN, Madhu Badoni, David Rolland, Payam Vahmani, Mike Dugan, Xianqin Yang, Agriculture and Agri-Food Canada, Lacombe, AB, Canada

P2-75 Antimicrobial Resistance in Surface Water of Two Rivers with Agricultural Use in Chile — Erika Estrada, Constanza Constanza Díaz, Carla Barria, Marilia Salgado, ANDREA MORENO SWITT, Aiko Adell, Universidad Andres Bello, Santiago, Chile

P2-76 Prevalence of Extended Spectrum β-Lactamase Encoding Genes: A South African Cucumber Agroecosystem Case Study. — Manana Dlangalala, Germán Villamizar-Rodríguez, ERIKA DU PLESSIS, Lise Korsten, University of Pretoria, Pretoria, South Africa

P2-77 Microbial Safety Status of Rape Produced and Sold from Small Scale Farming in South Africa — Degracious Kgoale, Stacey Duvenage, ERIKA DU PLESSIS, Lise Korsten, University of Pretoria, Pretoria, South Africa

P2-78 Beef Contamination with *Salmonella* spp. and Their Resistance to Antibiotics is a Concern and a Threat to Public Health — REJOICE EKLI, Frederick Adzitey, Anthony Amison Agbolosu, University for Development Studies, Tamale, Ghana

P2-79 Preliminary Investigation of Antimicrobial Resistance Genes in Microbes from Different Types of Retail Food — HONGSHENG HUANG, Chris Grenier, Beverley Phipps-Todd, Andrea Arzate, Karen Zhao, Nur Syifa Azmil, Dele Ogunremi, Susan Nadin-Davis, Ottawa Laboratory – Fallowfield, Canadian Food Inspection Agency, Ottawa, ON, Canada

P2-80 Dissemination of Incn Plasmid Carrying *Mph*a, *Oqx*ab and $Bla_{CTX\text{-}M\text{-}14}$/$Bla_{CTX\text{-}M\text{-}65}$ in Extensively Drug-resistant *Salmonella* Indiana ST17 Isolated from Humans and Retail Foods in Shanghai, China — ZENGFENG ZHANG, Xiaojie Qin, Jingxian Yang, XiuJuan Zhou, Yan Cui, Chunlei Shi, Xianming Shi, Shanghai Jiao Tong University, Shanghai, China

P2-81 The Cantaloupe Farm Environment Has a Diverse Genetic Pool of Antibiotic-Resistance and Virulence Genes — JANETH PÉREZ-GARZA, Santos Garcia, Eduardo Franco, Norma Heredia, Universidad Autónoma de Nuevo León, San Nicolas, Mexico

P2-82 A Nationwide Survey of Food Safety Practices on Small Microgreen Farms in the United States — GINA RIGGIO, Kristen Gibson, University of Arkansas, Fayetteville, AR, USA

P2-83 Bacteria Communities Analysis by 16S Arnr Gene Sequencing in a Melon Producing Agro-Environment — VICTOR MERCADO, Eduardo Franco, Angel Merino, Luisa Solis, Norma Heredia, Santos Garcia, Departamento de Microbiología e Inmunología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, San Nicolas, Mexico

P2-84 Evaluation of Chlorine Dioxide Gas against Four *Salmonella enterica* Serovars Artificially Contaminated on Whole Blueberries — BASSAM A. ANNOUS, David Buckley, David Kingsley, Angela Burke, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P2-85 Characteristics of Antimicrobial Resistance of *Salmonella enterica* Isolates from Retail Foods in Shanghai, China — JINGXIAN YANG, Zengfeng Zhang, Xiaojie Qin, Yan Cui, XiuJuan Zhou, Xianming Shi, Shanghai Jiao Tong University, Shanghai, China

P2-86 Phenotypic and Genotypic Analysis of Antibiotic Resistance of *Listeria monocytogenes* Isolated from Food Products — Greetje Castelijn, Redmar van den Berg, Michel Rapallini, Menno van der Voort, BART WULLINGS, Netherlands Food and Consumer Product Safety Authority (NVWA) Laboratory Feed, Food & Consumer product safety, Wagenigen, The Netherlands

P2-87 Assessment of Veterinary Drugs Present in Pork Kidney Purchased from Four Retail Stores — WEILIN SHELVER, Amy McGarvey, U.S. Department of Agriculture, Fargo, ND, USA

Viruses and Parasites

P2-88 Withdrawn

P2-89 The Presence of *Cryptosporidium* spp., *Cyclospora cayetanensis, Toxoplasma gondii,* and *Giardia intestinalis* in Potential Alternative Sources of Agricultural Water: A Conserve Study — SHANI CRAIGHEAD, Brienna Anderson, Samantha Gartley, Alyssa Kelly, Alexis Omar, Adam Vanore, Chengsheng Jiang, Walter Betancourt, Charles Gerba, Joseph Haymaker, Derek Foust, Rico Duncan, Chanelle White, Salina Parveen, Fawzy Hashem, Sarah Allard, Amy Sapkota, Kali Kniel, University of Delaware, Newark, DE, USA

P2-90 Diverse Shiga Toxin-producing *Escherichia coli*-specific Bacteriophages Exist in Goat Feces and the Surrounding Environments on an Organic, Produce-growing Farm in Northern California, USA — MARION LENNON, Yen Te Liao, Carol Lauzon, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P2-91 Crassphage as a Source Tracking Tool to Investigate Human Stool Contamination — GEUN WOO PARK, Terry Fei Fan Fan, Anna Montmayeur, Jan Vinjé, Centers for Disease Control and Prevention, Atlanta, GA, USA

P2-92 Virus Recovery Affected by Contact Surface Physicochemistry of Polymer and Glass — Y. CAROL SHIEH, Runan Yan, Yun Wang, Tim Duncan, U.S. Food and Drug Administration, Bedford Park, IL, USA

P2-93 The Prevalence of Bacteriophages Lytic against Shiga Toxin-producing *Escherichia coli* (STEC) and Its Correlation with STEC Bacterial Hosts in an Organic Farm — YEN TE LIAO, Marion Lennon, Alexandra Salvador, Valerie Lavenburg, Angeline Hsu, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P2-94 Chemical Inactivation of *Encephalitozoon intestinalis* and *Salmonella* Enteritidis — LORDWIGE ATIS, Maria Torres, Ynes Ortega, University of Georgia, Griffin, FL, USA

P2-95 Optimization and Evaluation of a Viradel Method for Viral Detection in Environmental Source Waters: A Conserve Study — BRIENNA ANDERSON-COUGHLIN, Shani Craighead, Alyssa Kelly, Samantha Gartley, Adam Vanore, Chengsheng Jiang, Walter Betancourt, Joseph Haymaker, Chanelle White, Derek Foust, Rico Duncan, Sarah Allard, Mary Theresa Callahan, Charles Gerba, Salina Parveen, Fawzy Hashem, Shirley A. Mi, University of Delaware, Newark, DE, USA

P2-96 Enteric Virus Detection in Leafy Greens — RACHEL RODRIGUEZ, Jacquelina Woods, U.S. Food and Drug Administration, Dauphin Island, AL, USA

P2-97 Preliminary Study on the Prevalence of Hepatitis A and E Viruses in Feral Fish Obtained from Two Major Lagoons in Lagos, Nigeria — SELIM ALARAPE, Babatunde Olusola, Olanike Adeyemo, David Olaleye, University of Ibadan, Ibadan, Nigeria

P2-98 Adaptation of the Human Intestinal Enteroid Infectivity Assay for Environmental Detection of Noroviruses — KATIE OVERBEY, Kellogg Schwab, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

P2-99 Antimicrobial-resistant Bacteria Present in Fresh Produce from the United States and Mexico — MARY THERESA CALLAHAN, Kara LeClair, Hectorina Rodulfo, Marcos De Donato, Shirley A. Micallef, University of Maryland, College Park, MD, USA

P2-100 Optimization of the Human Intestinal Enteroid Model to Study the Efficacy of Sanitizers against Human Norovirus — BLANCA ESCUDERO-ABARCA, Rebecca Goulter, Lee-Ann Jaykus, North Carolina State University, Raleigh, NC, USA

P2-101 Efficacy of a Novel Alcohol-based Surface Sanitizer against Human Norovirus — BLANCA ESCUDERO-ABARCA, James Arbogast, Chris Fricker, Rachel Leslie, Emma Lepri, Lee-Ann Jaykus, North Carolina State University, Raleigh, NC, USA

P2-102 Murine Norovirus Remains Stable at Extreme pH in Association with *Bacillus cereus* — Giselle Almeida, WENJUN DENG, Kristen Gibson, University of Arkansas, Fayetteville, AR, USA

Sanitation and Hygiene

P2-103 Performance of Traditional and Eco-friendly Sanitizers against *Listeria* spp. at Various Temperatures and Organic Loads — CARA BOUCHER, Joy Waite-Cusic, David Stone, Jovana Kovacevic, Oregon State University, Portland, OR, USA

P2-104 Comparison of Chemical Methods for Removal of *Listeria innocua* Biofilm Attached to a Stainless Steel Surface — GARY GAMBLE, U.S. Department of Agriculture – ARS, Athens, GA, USA

P2-105 Effect of Dry Sanitization on Biofilm of *Salmonella* Strains Isolated from the Peanut Supply Chain — Aline Morgan von Hertwig, Flávia Souza Prestes, André Aquino Mariano Pereira, Pâmela de Oliveira Pena, Astrid Caroline Muniz Silva, Andreia Miho Morishita Harada, MARISTELA DA SILVA NASCIMENTO, University of Campinas (UNICAMP), Department of Food Technology, Faculty of Food Engineering (FEA), Campinas, Brazil

P2-106 Synergistic Effect of Sodium Hypochlorite and UV Light on the Survival of *Listeria monocytogenes* Biofilms — ELLEN MENDEZ, Brian Tande, Valentina Trinetta, KSU Food Science Institute, Manhattan, KS, USA

P2-107 Bacteriophages as Biosanitizers: Using Lytic Phage to Control and Eradicate *Listeria monocytogenes* Biofilm — Stevan Cucic, Janet Lin, Cezar Khursigara, HANY ANANY, Agriculture and AgriFood Canada, Guelph, ON, Canada

P2-108 Effect of Wash Water Matrix on the Correlation between Free Chlorine and Oxidation-reduction Potential during Fresh Produce Washing Operations — SAM VAN HAUTE, Yaguang Luo, Bin Zhou, Imca Sampers, Martijn Vanhaverbeke, Patricia Millner, Ghent University Global Campus, Incheon, South Korea

P2-109 Multi-Lab Validation for FDA Identification of *Salmonella*, *E. coli* and *Listeria monocytogenes* Using the Vitek-MS System — MICHAEL BROWN, Lisa Newberry, Thomas Hammack, Kristopher Stanya, Christopher Peters, Amir Alavi, Shannon Ruelle, Gary Hartman, Henry Lau, Elizabeth Reed, Jennifer Hait, Ashfaqe Ahmed, Stephanie Horton, Tamayo Barnes, Nancy Miranda, Pongpan Laksanalamai, Michele Plehn, Dana Waggon, U.S. Food and Drug Administration, Bothell, WA, USA

P2-110 Influence of Suspended Particulates from Harvest Debris on *Salmonella* Survival in Chlorinated Whole Tomato Wash Water — SAM VAN HAUTE, Yaguang Luo, Samantha Bolten, Ganyu Gu, Xiangwu Nou, Bin Zhou, Patricia Millner, Ghent University Global Campus, Incheon, South Korea

P2-111 Efficacy of Ferrous and Alkaline-activated Persulfate to Remove Foodborne Pathogens from Romaine Lettuce — HANG QI, Yung-Hsiang Tsai, Yen-Con Hung, University of Georgia, Griffin, GA, USA

P2-112 Comparison of Sanitation Methods Commonly Used by the United States Fresh Produce Industry or Ghanaian Households for Inactivating — Joycelyn K. Quansah, Koushik Adhikari, JINRU CHEN, Department of Food Science and Technology, The University of Georgia, Griffin, GA, USA

P2-113 Influence of Bacterial Competitors on S*almonella enterica* Growth in Microbiological Media and Attachment to Vegetable Seeds — Da Liu, JINRU CHEN, Department of Food Science and Technology, The University of Georgia, Griffin, GA, USA

P2-114 Analyzing Aggregate Environmental Monitoring Data for *Listeria* spp. in Frozen Food Manufacturing Environments — BRITTANY MAGDOVITZ, Sanjay Gummalla, Harshavardhan Thippareddi, Mark Harrison, University of Georgia, Athens, GA, USA

P2-115 Evaluation of Enzymatic Cleaning on the Microbial Flora of Installations and the Food Products in a Processed Food Industry — LAURENT DELHALLE, Bernard Taminiau, Papa Abdoulaye Fall, Sophie Burteau, Sebastien Fastrez, Marina Ballesteros, Georges Daube, University of Liege, Liege, Belgium

P2-116 Inactivation of *Escherichia coli* O157:H7 in Radish Seeds by Combined Treatments of Gaseous Chlorine Dioxide and Mild Wet Het — WOORIM YEOM, Hyejung Shin, Jee-Hoon Ryu, Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, South Korea

P2-117 Influence of Types of Abiotic Surfaces on Antimicrobial Activities of Gaseous Chlorine Dioxide Against *Bacillus cereus* Spores — JEONGMIN LEE, Yurim Cho, Nam-Taek Lee, Jee-Hoon Ryu, Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, South Korea

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P2-118 Inactivation of *Escherichia coli* O157:H7 on Various Abiotic Surfaces Using Gaseous Chlorine Dioxide — JEONGMIN LEE, Yurim Cho, Nam-Taek Lee, Jee-Hoon Ryu, Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, South Korea

P2-119 *Escherichia coli* O157:H7 Inactivation in Phosphate Buffer by X-Ray with Various Levels of Accelerating Voltage — YUWEI WU, Sam Chang, Mississippi State University, Pascagoula, MS, USA

P2-120 Consecutive Treatments with Sterilex Eliminate Biofilms by — RONG WANG, You Zhou, Norasak Kalchayanand, Dayna Harhay, Tommy Wheeler, U.S. Department of Agriculture-ARS, Clay Center, NE, USA

P2-121 Comparison of Antimicrobial Activities of Organic Acid Vapors Against *Escherichia coli* O157:H7 and *Listeria monocytogenes* Attached on Stainless Steel — HYEJUNG SHIN, Woorim Yeom, Jee-Hoon Ryu, Department of Biotechnology, College of Life Sciences and Biotechnology, Korea University, Seoul, South Korea

P2-122 Reduction of *Escherichia coli* O157:H7 and *Salmonella* Typhimurium on Formica Coupons by Switchgrass Extractives, a Value-Added Product — JOSEPH CHOI, Emily Camfield, Nicole Labbe, Kimberly Gwinn, Bonnie Ownley, Naima Moustaid-Moussa, Doris D'Souza, University of Tennessee, Knoxville, TN, USA

P2-123 Disinfection Efficiency of Slightly Acidic Electrolyzed Water Combined with Chemical Treatments on Fresh Fruits — ERIC BANAN-MWINE DALIRI, Xiuqin Chen, Charles Nkufi Tango, Deog-Hwan Oh, Kangwon National University, Chuncheon, South Korea

P2-124 Effectiveness of Blue Light-emitting Diode Illumination in the Inactivation of Histamine-producing Bacteria — YU-RU HUANG, Yung-Hsiang Tsai, Yi-Chen Lee, Yi-Yin Chen, National Penghu University of Science and Technology, Penghu, Taiwan

P2-125 Efficacy of Novel Photo-chlorine Dioxide against *Clostridium difficile* Endospores — MUTHU DHARMASENA, David Buckley, Hongye Wang, Xiuping Jiang, Clemson University, Clemson, SC, USA

P2-126 Ultraviolet Light with Grape Seed Extract and Curcumin Inactivates Aichi Virus on Formica Surfaces — JACKSON CRAIG, Janie Hetu, Doris D'Souza, University of Tennessee, Knoxville, TN, USA

P2-127 Effect of High Intensity Light Pulses on the Reduction of Microbial Load in Chia (*Salvia hispanica L.*) Seeds — RAUL AVILA-SOSA, Josué Said Méndez-Aguilar, Fatima Reyes-Jurado, Aurelio Lopez-Malo, Enrique Palou, Carlos Enrique Ochoa-Velasco, Addí Rhode Navarro-Cruz, Benemérita Universidad Autónoma de Puebla, Puebla, Mexico

P2-128 Evaluation of Environmental Monitoring Tools for the Release of Microorganisms — SARAH JONES, Kristen Gibson, University of Arkansas, Fayetteville, AR, USA

P2-129 Usage Status of ATP Bioluminometers by Dietitians of the Center for Children's Foodservice Management in Korea — HYE-KYUNG MOON, Seolhee Ahn, Changwon National University, Changwon, South Korea

P2-130 Comparison of Sanitary Inspection Results on Knives and Gloves by the Grade of Children's Foodservice — HYE-KYUNG MOON, Changwon National University, Changwon, South Korea

P2-131 The Efficacy of ATP Monitoring Systems for Measuring Organic Load on Postharvest Surfaces — KRISTIN LANE, Lynne McLandsborough, Wesley Autio, Amanda Kinchla, University of Massachusetts, Amherst, MA, USA

P2-132 Changes in AMP, ADP, and ATP Concentrations over Extended Growth Curves for Bacterial Species Significant to Food Hygiene — NICHOLAS W SMITH, Jeffrey Sindelar, Scott A Rankin, University of Wisconsin-Madison, Department of Food Science, Madison, WI, USA

P2-133 Sanitation Monitoring of Stainless Steel Surfaces Using the Total Adenylates Hygiene Monitoring Test — NATSUMI TANAKA, Wataru Saito, Mikio Bakke, Kikkoman Biochemifa Company, Noda, Japan

P2-134 Evaluation of Two Real-time BAX PCR Assays for the Detection of Genus *Listeria* Species and *Listeria monocytogenes* — NISHA CORRIGAN, Maryse Rannou, Lizaig Gouguet, Christophe Quere, Thomas Moeller, Hugo Gonzalez, Qualicon Diagnostics LLC, A Hygiena Company, Wilmington, DE, USA

P2-135 The Effect of Food Safety on Customer Satisfaction: Exploring Customer-generated Reviews through Business Intelligence — JACK HODGES, Minwoo Lee, Agnes DeFranco, Sujata A. Sirsat, University of Houston, Houston, TX, USA

P2-136 Evaluating FDA Food Recalls with Sanitation as a Root Cause — AMIT KHERADIA, Remco, Zionsville, IN, USA

P2-137 Hand and Glove Surface Cross-Contamination Potential Based on Nitrile and Vinyl Glove Surface Characteristics — BARRY MICHAELS, Christopher Griffith, Stephen Ardagh, B. Michaels Group Inc., Palatka, FL, USA

P2-138 The Development of a Multiple Hurdle Approach to Improve Microbial Safety of Ground Beef — Ranjith Ramanathan, CONNER MCDANIEL, Sabra Billups, Divya Jaroni, Ravirajsinh Jadeja, Oklahoma State University, Stillwater, OK, USA

P2-139 Evaluation of a Commercial Enzymatic Drain Cleaner for Food Matrix Digestion — Stephanie Hice, Shalini Wijeratne, Joey Talbert, BYRON BREHM-STECHER, Iowa State University, Ames, IA, USA

P2-140 Microbial Analyses of Dried Crickets Used as a Human Protein Supplement — JENNIFER PERRY, University of Maine School of Food and Agriculture, Orono, ME, USA

P2-141 Development of an Indirect Enzyme-Linked Immunosorbent Assay (ELISA) for the Rapid Detection of Peanut in Processed Foods — SOL-A KIM, Jeong-Eun Lee, Hyo-In Kim, Won Bo Shim, Gyeongsang National University, Jinju, South Korea

P2-142 Food Safety Risk Associated with Dropped Produce on *Listeria monocytogenes*-contaminated Floor Surfaces in Grocery Stores — Angela Shaw, MANREET BHULLAR, Ana Monge, Jacques Overdiep, Bridget Perry, Lillian Nabwiire, Niraja Shivalingaiah, Iowa State University, Ames, IA, USA

P2-143 An Approach to Implementing the FDA Recommendation to Verify the Minimization of Contamination and/or Spread of Pathogens in Fresh Cut Processing Food Facilities — ANGELA NUNEZ, Christopher McGinnis, Eric Wilhelmsen, Jim Brennan, SmartWash Solutions, LLC, Salinas, CA, USA

P2-144 An Acidic Silver Ion Pretreatment Can Greatly Reduce the Risk of an Illness Outbreak for Fresh Cut Leafy Greens — JIM BRENNAN, Eric Wilhelmsen, Christopher McGinnis, Tom Myers, Florence Wu, SmartWash Solutions, LLC, Salinas, CA, USA

P2-145 Growth Kinetics of *Listeria monocytogenes*, Shiga Toxin-producing *Escherichia coli*, and *Salmonella enterica* on Fresh-cut Produce Stored at 5, 10, or 22°C — BINGZHUO ZHAO, University of Wisconsin-Madison, Madison, WI, USA

P2-146 Comparison of Sodium Nitrite and Natural Celery Nitrite on the Inhibition of Spore Germination of *Clostridium sporogenes* as a Nonpathogenic Surrogate Assay in Meat Products — DENNIS PLETCHER, Jacob Nelson, Peter Muriana, Oklahoma State University, Stillwater, OK, USA

Produce

P2-147 Combined Effect of Storage Conditions, Surface Integrity, and Length of Shelf Life on the Growth of *Listeria monocytogenes* and Spoilage Microbiota on Refrigerated Ready-to-eat Products — SHIYU CAI, Randy Worobo, Abigail Snyder, The Ohio State University, Columbus, OH, USA

P2-148 Growth and Survival of *Listeria monocytogenes* on Intact Fruit and Vegetable Surfaces: A Systematic Review — CLAIRE M. MARIK, Joyce Zuchel, Donald W. Schaffner, Laura K. Strawn, Virginia Tech, Blacksburg, VA, USA

P2-149 Prevalence of *Salmonella* spp. Isolated from Environmental Food Surfaces from Vegetable Markets in Cambodia — CARLA SCHWAN, Karina Desiree, Kanwal Ayub, Jessie Vipham, Kansas State University, Manhattan, KS, USA

P2-150 Prevalence and Quantification of *Salmonella* spp., Generic *Escherichia coli* and Coliforms on Vegetables Sold in Informal Markets in Cambodia — KARINA DESIREE, Carla Schwan, Kanwal Ayub, Jessie Vipham, Kansas State University, Manhattan, KS, USA

P2-151 Validation of the Efficacy of Triple Wash Procedures with Commercial Antimicrobials to Inactivate *Salmonella* and *Listeria monocytogenes* and Improve Microbial Quality of Squashes: Laboratory and Onsite Plant Studies — KA WANG LI, Lisa Jones, Wentao Jiang, Hanna Khouryieh, Cangliang Shen, West Virginia University, Morgantown, WV, USA

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P2-152 Cold Plasma Activation (Ionization) Enhances the Efficacy of Aerosolized Hydrogen Peroxide in Reducing Populations of *Salmonella* Typhimurium and *Listeria innocua* on Apples, Tomatoes, Cantaloupe and Romaine Lettuce — Yuanyuan Song, XUETONG FAN, U.S. Department of Agriculture, ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P2-153 Surface Survival and Internalization of *Salmonella enterica* Inoculated Onto the Surface of Cucumber Fruit — BRENDA KROFT, Jie Zheng, Shirley A. Micallef, University of Maryland, College Park, MD, USA

P2-154 Microbial Safety Status of Rape Produced and Sold from Small-scale Farming in South Africa — DEGRACIOUS KGOALE, Stacey Duvenage, Erika du Plessis, Lise Korsten, University of Pretoria, Pretoria, South Africa

P2-155 Persistence of *Cyclospora cayetanensis*, *Cryptosporidium parvum* and *Salmonella enterica* Typhimurium on Cilantro (*Coriandrum sativum*) and Parsley (*Petroselinum crispum*) When Introduced by Spray Irrigation — IKECHUKWU OGUADINMA, Juan Carlos Diaz-Perez, Maria Torres, Marilyn Erickson, Ynes R. Ortega, University of Georgia, Griffin, GA, USA

P2-156 Decontamination of Raw Cucumbers Using Microbubbles — JOSEPH EIFERT, Noah Wax, Pengyu Chen, Sunghwan Jung, Virginia Tech, Blacksburg, VA, USA

P2-157 Effect of Storage Temperature on the Survival or Growth of *Listeria monocytogenes* on Whole and Fresh-cut Produce — JUAN MOREIRA, Erika Mera, Achyut Adhikari, Louisiana State University, Baton Rouge, LA, USA

P2-158 Inactivation of *Salmonella* Typhimurium during Flume Washing of Diced Tomatoes with a Sulfuric Acid/Surfactant-based Sanitizer — NATASHA SLONIKER, Chunyu Kang, Elliot Ryser, Michigan State University, East Lansing, MI, USA

P2-159 Dieoff of *E. coli* and Attenuated *Salmonella* Typhimurium on Baby Lettuce and Spinach under Field Conditions Following a Standardized Simulated Irrigation Event with Contaminated Water in New York, California, and Spain — ALEXANDRA BELIAS, Adrian Sbodio, Pilar Truchado, Daniel Weller, Ana Allende, Daniel Munther, Trevor Suslow, Martin Wiedmann, Renata Ivanek, Cornell University, Ithaca, NY, USA

P2-160 Comparison of Mid-Atlantic Grower Perceptions and Nontraditional Irrigation Water Realities: A Conserve Study — SARAH ALLARD, Mayhah Suri, Sultana Solaiman, Mary Theresa Callahan, Chanelle White, Paul Goeringer, Daphne Pee, Joseph Haymaker, Fawzy Hashem, Eric May, Salina Parveen, Kali Kniel, Manan Sharma, Shirley A. Micallef, Rachel Rosenberg Goldstein, Amy Sapkota, Maryland Institute for Applied Environmental Health, University of Maryland, School of Public Health, College Park, MD, USA

P2-161 Enhancing Microbial Safety of Microgreens: Combined Ultrasound and Warm Water Treatment as an Environmentally-friendly Seed Sanitation Method — Hee Kyung Park, MENGYI DONG, Hao Feng, University of Illinois at Urbana-Champaign, Urbana, IL, USA

P2-162 Antimicrobial Effects of Spraying Calcium Oxide Solution on Sprouting Seeds — MENGYI DONG, Hee Kyung Park, Hao Feng, University of Illinois at Urbana-Champaign, Urbana, IL, USA

P2-163 Washing Techniques to Reduce Microbial Growth Using Different Sanitizers on Fresh Lettuce — PRACHI PAHARIYA, Ruplal Choudhary, Derek Fisher, Southern Illinois University, Carbondale, IL, USA

P2-164 Survival of *Listeria monocytogenes* in Hydroponic Lettuce Systems — MARGARET R. MOODISPAW, Carlos Saint-Preux, Vishal Srivastava, Melanie L. Lewis Ivey, Sanja Ilic, The Ohio State University, Columbus, OH, USA

P2-165 Microbial Populations in Recirculating Hydroponic System and Packaged Lettuces — ADWOA DANKWA, Robson Machado, Jennifer Perry, University of Maine, Orono, ME, USA

P2-166 Examination of the Growth and Survival of *Listeria monocytogenes* in Hydroponic Fertilizer Solutions Maintained at Different pH — JANNY MENDOZA, Achyut Adhikari, Louisiana State University AgCenter, Baton Rouge, LA, USA

P2-167 Inactivation of *Escherichia coli* O157:H7 in Spinach Leaves by Nonthermal Pulsed Light and Novel Sanitizer Wash Combination — SUDARSAN MUKHOPADHYAY, Kimberly Sokorai, Dike Ukuku, Xuetong Fan, Modesto Olanya, Vijay Juneja, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P2-168 Ozonized Water with Plant Antimicrobials: An Effective Method to Inactivate *Salmonella enterica* on Iceberg Lettuce in Produce Wash Water — GOVINDARAJ DEV KUMAR, Sadhana Ravishankar, University of Georgia Center for Food Safety, Griffin, GA, USA

P2-169 Survey of Potential Sources of *E. coli* on Lands Adjacent to Leafy Green Fields — PAULA RIVADENEIRA, Channah Rock, University of Arizona, Yuma, AZ, USA

P2-170 Isolation and Characterization of *Escherichia coli* from Leafy Green Vegetables Using Molecular and Antimicrobial Disc Diffusion Method — DUSTIN SMITH, Leonard Williams, Janak Khatiwada, Meagan Thompson, Shurrita Davis, North Carolina A&T State University-Center of Postharvest Technologies (CEPHT), Kannapolis, NC, USA

P2-171 Pilot Plant Simulation of an In-Process Aggregating Continuous Sampling Technique on Spinach — FLORENCE WU, Steven Huang, Christopher McGinnis, Eric Wilhelmsen, AEMTEK, Inc., Fremont, CA, USA

P2-172 Performance Evaluation of a GENE-UP Real-time PCR in a Unit Dose Format (EH1-2) for the Detection of Shiga Toxin-producing *E. coli* in 200 g Spinach — MICHELLE KEENER, Deborah Briese, Peter Ladell, Ron Johnson, John Mills, Stan Bailey, Vikrant Dutta, bioMérieux Inc., Hazelwood, MO, USA

P2-173 Evaluation of Viability of *Escherichia coli* O157:H7 and *Listeria monocytogenes* on Sanitizer-treated Spinach Leaves Using Combined Propidium Monoazide Staining and Quantitative PCR — VIJAY SINGH CHHETRI, Yu Han, Marlene Janes, Achyut Adhikari, Louisiana State University AgCenter, Baton Rouge, LA, USA

P2-174 Sodium Bisulfate and Peroxyacetic Acid Reduce *Escherichia coli* O157:H7 Populations on Fresh Romaine When Applied Alone or in Combination as a Postharvest Wash — JOSHUA MAHER, Katelynn Stull, Eleni Pliakoni, Sara Gragg, Kansas State University, Manhattan, KS, USA

P2-175 Assessing the Role of Phyllosphere Bacteria on Norovirus Stability and Attachment in Romaine Lettuce — IRENE YIM, Erin DiCaprio, University of California Davis, Davis, CA, USA

P2-176 Effect of a Bacteriophage Cocktail against *Salmonella enterica* on Romaine Lettuce Leaves — CATHERINE WONG, Siyun Wang, Pascal Delaquis, Food, Nutrition and Health, University of British Columbia, Vancouver, BC, Canada

P2-177 Methods Evaluation to Differentiate Presumptive *Bacillus cereus* on Butterhead Lettuce — THOMAS DE BOCK, Jelena Jovanovic, Andreja Rajkovic, Monica Höfte, Mieke Uyttendaele, Laboratory of Food Microbiology and Food Preservation, Department of Food Technology, Safety and Health, Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium

P2-178 *Salmonella enterica* Colonization of Kale Leaves is Age and Drought Stress-dependent — XINGCHEN LIU, Shirley A. Micallef, University of Maryland, College Park, MD, USA

P2-179 Isolation and Identification of Molecular of *Pseudomonas* spp. Isolated on Green Leafy Vegetables Purchased from Retail Sources — SHURRITA DAVIS, Leonard Williams, Meagan Thompson, Dustin Smith, Janak Khatiwada, North Carolina A&T State University–Center of Postharvest Technologies (CEPHT), Kannapolis, NC, USA

P2-180 Transfer of Indicator *Escherichia coli* to Spinach and Carrots Grown in Organic Soil Amended with Raw Animal Manure in California, 2017 to 2018 — PEIMAN AMINABADI, Alda Pires, Patricia Millner, Anna Zwieniecka, Thais Ramos, Michele Jay-Russell, Western Center for Food Safety, University of California-Davis, Davis, CA, USA

P2-181 *Salmonella* Prevalence, Concentration, and Diversity in Poultry Litter in the Southern United States — LAUREL DUNN, Loretta Friedrich, Vijendra Sharma, Travis Chapin, Keith Schneider, Michelle Danyluk, University of Georgia, Athens, GA, USA

TUESDAY

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P2-182 Different Soil Contamination Levels of *Salmonella* Newport Influence Internalization during Pepper Transplanting — CAMERON BARDSLEY, Joyce Zuchel, Robert Williams, Gregory Welbaum, Steve Rideout, Renee Boyer, Laura K. Strawn, Virginia Tech – Eastern Shore AREC, Painter, VA, USA

P2-183 Improving the Microbial Safety of Sprouts Using Lactic Acid Bacteria Cultures — JANETH PEREZ GARZA, Deepa Ashwarya Kuttappan, Mary Anne Amalaradjou, University of Connecticut, Storrs, CT, USA

P2-184 Procedures for Improved Detection and Isolation of *E. coli* O157:H7 from Artificially Contaminated Sprout Irrigation Water — WILLIS FEDIO, Ruben Zapata, Lyssa White, Brian Lorber, Yatziri Preciado, New Mexico State University, Las Cruces, NM, USA

P2-185 Determining Water Quality and Bacterial Load on Tomatoes in Flume Tanks from Florida Packinghouses. — BRUNA BERTOLDI, Jaysankar De, Christopher Baker, Christopher Pabst, Alan Gutierrez, Keith Schneider, University of Florida, Gainesville, FL, USA

P2-186 Investigating the Prevalence, Persistence, and Diversity of *Listeria monocytogenes* and *Listeria* Species in Produce Packinghouses — ERIKA ESTRADA, Genevieve Sullivan, Alexis M. Hamilton, Faith Critzer, Martin Wiedmann, Laura K. Strawn, Virginia Tech - Eastern Shore AREC, Painter, VA, USA

P2-187 Detecting *Listeria monocytogenes* in a Variety of Individually Quick-Frozen Vegetables Using the BAX System Real-time PCR Assay — JULIE WELLER, Anastasia Likanchuk, Priyanka Surwade, Andrew Farnum, Victoria Kuhnel, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P2-188 A Multi-regional Study of Generic *Escherichia coli* Persistence in Soils Amended with Raw Manure and Produce in Organic Farming Systems — Thais Ramos, Michele Jay-Russell, Patricia Millner, James Stover, Paulo Pagliari, Mark Hutchinson, Jason Liley, Nicholas Rowley, Peiman Aminabadi, Jerome Baron, Annette Kenney, Fawzy Hashem, ALDA PIRES, University of California, Davis, CA, USA

P2-189 Multi-regional Prevalence and Persistence of Four Foodborne Pathogens in Manured Soils in Certified Organic Farms — Thais Ramos, Michele Jay-Russell, Patricia Millner, James Stover, Paulo Pagliari, Mark Hutchinson, Jason Liley, Nicholas Rowley, Peiman Aminabadi, Jerome Baron, Annette Kenney, Fawzy Hashem, ALDA PIRES, University of California, Davis, CA, USA

P2-190 Decontamination of Pathogens on Produce Using Chlorine Dioxide Gas Generated by Sodium Chlorite Acid Reaction — HUI-ERH CHAI, Cheng-An Hwang, Lihan Huang, Vivian Chi-Hua Wu, Lee-Yan Sheen, Institute of Food Science and Technology, National Taiwan University, Taipei, Taiwan

P2-191 Role of the Dormant State in the Persistence and Resistance of Shiga Toxin-producing *Escherichia coli* in the Fresh Produce Chain — XUEYANG WU, Abdulhakeem Alzahrani, Chelsey Tremblay, Keith Warriner, University of Guelph, Guelph, ON, Canada

P2-192 Detection of Low Levels of *Salmonella* spp. in Sprout Rinse Water Using the RapidChek SELECT *Salmonella* Test Method — Lois Fleck, MEREDITH SUTZKO, Romer Labs, Inc., Newark, DE, USA

P2-193 *Salmonella* Detection Via Immunomagnetic Separation and Liquid Crystal Technology — ADELINO DOSSANTOS, Amie Minor, Brenda Keavey, Zachary Kuhl, Megan Young, WVDA, Charleston, WV, USA

P2-194 Antimicrobial Effect of Natural Fruit Extracts against *Salmonella* on Cucumbers — SUYEUN BYUN, Chi-Hung Chen, Hsinbai Yin, Jitu Patel, U.S. Department of Agriculture, Beltsville, MD, USA

P2-195 Carvacrol Nanoemulsion Controls *Escherichia coli* O157:H7 on Fresh Produce — CHI-HUNG CHEN, Hsinbai Yin, Zi Teng, Suyeun Byun, Yaguang Luo, Jitu Patel, University of Maryland, College Park, MD, USA

P2-196 Control of *Listeria monocytogenes* on Fresh Strawberries by Lactic Acid Bacteria — Stephanie Colorado-Suarez, HSINBAI YIN, Chi-Hung Chen, Jitu Patel, University of Maryland, Baltimore, MD, USA

P2-197 Efficacy of Benzyl Isothiocyanate for Controlling *Salmonella* on Alfalfa Seeds — HSINBAI YIN, Chi-Hung Chen, Ashley Boomer, Jitu Patel, University of Maryland, Baltimore, MD, USA

P2-198 Growth Potential of *Listeria monocytogenes* in Apple Flesh and Juice — SURASRI SAHU, Girdhari Sharma, Isha Patel, Atin Datta, U.S. Food and Drug Administration - CFSAN, Laurel, MD, USA

P2-199 Impact of Field Debris on Tomato Wash Water Quality Deterioration — BIN ZHOU, Yaguang Luo, Zi Teng, Xiangwu Nou, Patricia Millner, U.S. Department of Agriculture–ARS, Beltsville, MD, USA

P2-200 Impact of Irrigation with Wastewater and Roof-harvested Rainwater on the Persistence of *Escherichia coli* Surrogates on Lettuce Cultivars in the Field — NIDHI GUPTA, Hsinbai Yin, Ashley Boomer, Chi-Hung Chen, Suyeun Byun, Jitu Patel, University of Maryland, College Park, MD, USA

P2-201 Potential for *Salmonella* Cross-Contamination during Tomato Washing and Pre- and Post-Wash Commingling — GANYU GU, Samantha Bolten, Sam Van Haute, Bin Zhou, Yaguang Luo, Steve Rideout, Xiangwu Nou, U.S. Department of Agriculture–ARS, Beltsville, MD, USA

P2-202 Preparation Methods to Produce a Postharvest Wash Water Model: Assessment and Validation for Use in Food Safety Studies — Paola Martinez-Ramos, AMANDA KINCHLA, Wesley Autio, Maria Corradini, Kristin Lane, University of Massachusetts, Amherst, MA, USA

P2-203 *Salmonella* Inactivation and Cross-Contamination on Cherry and Grape Tomatoes during Washing in Simulated Commercial Wash Water — SAMANTHA BOLTEN, Ganyu Gu, Sam Van Haute, Bin Zhou, Patricia Millner, Yaguang Luo, Shirley A. Micallef, Xiangwu Nou, U.S. Department of Agriculture–ARS, Beltsville, MD, USA

P2-204 Evaluation of Viral Infectivity during the Frozen Storage of Berries — ALYSSA KELLY, Brienna Anderson, Robyn Miranda, Donald W. Schaffner, Kali Kniel, University of Delaware, Newark, DE, USA

P2-205 Steady State Gaseous Chlorine Dioxide Treatment for the Inactivation of Tulane Virus on Berry Fruits — DAVID KINGSLEY, Bassam A. Annous, U.S. Department of Agriculture, Dover, DE, USA

P2-206 The Effect of Edible Nano Coating for Improving Shelf Life and Food Safety of Raspberries — AROSHA LOKU UMAGILIYAGE, Ruplal Choudhary, Southern Illinois University, Carbondale, IL, USA

P2-207 Effective Pack Practices: Use of Antifungal Packaging Films with Cinnamaldehyde Nanoemulsions to Control Postharvest Diseases in Strawberries — AUSTIN MCDANIEL, Helena Pontes Chiebao, Eleni Pliakoni, Londa Nwadike, Umut Yucel, Valentina Trinetta, Kansas State University, Food Science Institute, Manhattan, KS, USA

P2-208 The Influence of Water Antimicrobials and Low Temperature Storage on Inhibiting *E. coli* O157:H7 and O26:H11 on Strawberries — Licheng Huang, Jingwen Gao, XIN LUO, Karl Matthews, Rutgers University, New Brunswick, NJ, USA

P2-209 Effects of X-Ray Irradiation on Pathogen Contamination and Quality Aspects of Fresh Blueberries — PHILIP STEINBRUNNER, Christopher Wells, Sanghyup Jeong, Michigan State University, East Lansing, MI, USA

P2-210 Efficacy of Gaseous Chlorine Dioxide in Reducing *Salmonella*, *E. coli* O157:H7, and *Listeria monocytogenes* on Strawberries and Blueberries — Phillip Luu, ACHYUT ADHIKARI, Louisiana State University AgCenter, Baton Rouge, LA, USA

P2-211 Inactivation of Murine Norovirus and Hepatitis A Virus on Strawberry, Blueberry and Raspberry by High Pressure Processing — MU YE, Xinmiao Xu, Alvin Lee, Institute for Food Safety and Health, Illinois Institute of Technology, Bedford Park, IL, USA

P2-212 Behavior of Two Serotypes of *Listeria monocytogenes* from Outbreaks and Recalls on the Surface of Stone Fruits during Refrigerated Storage — ANTONIO J DE JESUS, Ishani Sheth, Zhujun Gao, Hee jin Kwon, Minji Hur, Thomas Hammack, Dumitru Macarisin, Yi Chen, U.S. Food and Drug Administration, College Park, MD, USA

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P2-213 Characterization of Tree Fruit Bacterial Communities during Harvest — KERRY COOPER, Janneth Pinzon, Margarethe Cooper, Mariya Skots, Gilberto Flores, Rachel Mackelprang, Trevor Suslow, The University of Arizona, Tucson, AZ, USA

P2-214 Microbial Quality of Peach Wash Water and Gloves Worn by Packers in Peach Packinghouses — PEIEN WANG, Joycelyn K. Quansah, Himabindu Gazula, Katie B. Pitts, Dario J. Chavez, Duke Lane III, Jinru Chen, Department of Food Science and Technology, The University of Georgia, Griffin, GA, USA

P2-215 Assessment of the Efficacy of Rapid Tests on Predicting Bacterial Growth on Apple Packinghouse Equipment Surfaces — ALEXIS M. HAMILTON, Ines Hanrahan, Marcella Galeni, Victor Villegas, Martin Blackburn, Monique Aguilar Borba, Cecilia Yiu, Daniel Gleason, Faith Critzer, Washington State University, School of Food Science, Pullman, WA, USA

P2-216 The Use of Advanced Oxidation Process to Degrade Chlorpyrifos and Reduce Colonies of *Escherichia coli* O157:H7 on Apples — JORDAN HO, University of Guelph, Guelph, ON, Canada

P2-217 Attachment Strength of Foodborne Pathogens on Different Melon Varieties from Various Regions in the United States — QI WEI, Monique Torres, Martin Porchas, Ting Fang, Paul Brierley, Sadhana Ravishankar, University of Arizona, Tucson, AZ, USA

P2-218 Survival of *Salmonella* spp. on Cantaloupe Field Pack Food Contact Surfaces — LORETTA FRIEDRICH, Benjamin Chapman, Laura K. Strawn, Michelle Danyluk, University of Florida CREC, Lake Alfred, FL, USA

P2-219 Aqueous Chlorine Dioxide Inactivates *Salmonella* on Whole Papaya — LIANGER DONG, Yong Li, University of Hawaii at Manoa, Honolulu, HI, USA

P2-220 Prevalence, Virulence and Antimicrobial Resistance of *Salmonella* Isolated from Mango "Ataulfo" — ANGÉLICA GODÍNEZ-OVIEDO, Montserrat Hernández-Iturriaga, Universidad Autónoma de Querétaro, Querétaro, Mexico

P2-221 Internalization of *Salmonella* spp. in Mangoes (*Mangifera indica*) Variety Tommy Atkins — CARLOS HENRIQUE TERSAROTTO, Bernadette DGM Franco, Faculty of Pharmaceutical Sciences, University of São Paulo, São Paulo, Brazil

P2-222 *Listeria* Contamination and Identification of Potential Growth Niches in a Ready-Meal Manufacturing Small- and Medium-sized Enterprise: A Case Study — Alin Turila, ELLEN W. EVANS, Elizabeth C. Redmond, ZERO2 FIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom

P2-223 Stress and Sanitizer Resistance Characterization of Persistent and Transient *Listeria monocytogenes* Isolates from a Cold-Smoked Salmon Processing Facility — ANNA SOPHIA HARRAND, Renato Orsi, Bala Jagadeesan, Leen Baert, Martin Wiedmann, Cornell University, Ithaca, NY, USA

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P2-224 Blue Light Exposure Kills *Escherichia coli* Cells Treated at Close Range and May Enhance Microgreen Food Safety — ELLEN R. TURNER, Yaguang Luo, Robert Buchanan, U.S. Department of Agriculture–ARS, Beltsville, MD, USA

P2-225 Effects of Switchgrass Fast Pyrolysis Biochar Generation Temperature on Survival of *E. coli* O157:H7 in Soil — JOSHUA GURTLER, Akwasi Boateng, Charles Mullen, U.S. Department of Agriculture-ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P2-226 Survival of Desiccation-resistant *Salmonella* on Apple Slices after Dehydration and Following Antimicrobial Immersion Treatments — JOSHUA GURTLER, Susanne Keller, Xuetong Fan, Modesto Olanya, Tony Jin, U.S. Department of Agriculture-ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P2-227 Prevalence and Distribution of *Listeria monocytogenes* in Public Watersheds of the Central California Coast Near Leafy Green Growing Areas from 2011 to 2016 — LISA GORSKI, Michael Cooley, Marc Allard, Eric Brown, Yi Chen, U.S. Department of Agriculture – ARS, WRRC, Albany, CA, USA

P2-228 Establishing Baseline Inhibition of *Escherichia coli* in Aqueous Dairy Manure Prior to Treatment by a Fungal Biocontrol Agent — ALEXIS OMAR, Sivaranjani Palani, Pushpinder Kaur Litt, Anastasia E. M. Chirnside, Kali Kniel, University of Delaware, Newark, DE, USA

P2-229 Bioremediation Practices to Reduce Human Pathogen Contamination for Agricultural Soils — MORGAN YOUNG, Carl Knueven, Siddhartha Thakur, Eduardo Gutierrez, North Carolina State University, Raleigh, NC, USA

P2-230 Effects of Manuring on Survival of *E. coli* in Certified Organic Field Soils and Transfer to Fresh Produce in the Delmarva Region — ANNETTE KENNEY, Fawzy Hashem, Alda Pires, Michele Jay-Russell, Patricia Millner, University of Maryland Eastern Shore, Princess Anne, MD, USA

P2-231 Strain, Soil Type, and Irrigation Regime Influence *Salmonella* Survival in Poultry Litter Amended Sandy and Clay Soils — LAURA K. STRAWN, Cameron Bardsley, Steve Rideout, David Ingram, Yuhuan Chen, Jane Van Doren, David Oryang, Virginia Tech - Eastern Shore AREC, Painter, VA, USA

P2-232 A Longitudinal Study Using 16s rRNA Gene Sequence Analysis of Soil Amended or Unamended with Heat-treated Poultry Pellets Contaminated with *Salmonella* Newport — MANOJ SHAH, Christopher Grim, Karen Jarvis, Teresa Bergholz, Manan Sharma, North Dakota State University, Fargo, ND, USA

P2-233 Factors Affecting *Salmonella* Newport Survival in Soil and Subsequent Transfer to Spinach Plants — MANOJ SHAH, Rhodel Bradshaw, Eric Handy, Cheryl East, Teresa Bergholz, Manan Sharma, North Dakota State University, Fargo, ND, USA

P2-234 Serotypes and Antimicrobial Resistance of *Salmonella* Recovered from Chicken Litter in Florida Operations — ALAN GUTIERREZ, Jaysankar De, Keith Schneider, University of Florida, Gainesville, FL, USA

P2-235 Survival of *Escherichia coli* O157 Recovered from Bovine Manure in Autoclaved and Unautoclaved Florida Sandy Soil — CHRISTOPHER BAKER, Shinyoung Lee, Jaysankar De, KwangCheol Casey Jeong, Keith Schneider, University of Florida, Gainesville, FL, USA

P2-236 Bacterial Survival as a Factor of Variation in Extrinsic and Intrinsic Soil Parameters with Biological Soil Amendments of Animal Origin — PUSHPINDER KAUR LITT, Alyssa Kelly, Quinn Riley, Alexis Omar, Gordon Johnson, Manan Sharma, Kali Kniel, University of Delaware, Newark, DE, USA

P2-237 Application of Rhizobacteria as a Biocontrol by Tackling Plant-Pathogen Interactions — PUSHPINDER KAUR LITT, Nick Johnson, Harsh Bais, Manan Sharma, Kali Kniel, University of Delaware, Newark, DE, USA

P2-238 Estimating *Salmonella* and *Campylobacter* Cell Density in Animal Feces and Their Potential to Lead to Significant Contamination Events — Taal Levi, Jennifer Allen, JOY WAITE-CUSIC, Oregon State University, Corvallis, OR, USA

P2-239 Isolation and Characterization of Extended Spectrum β-Lactamase (ESBL) Producing Non-Shiga-toxigenic *Escherichia coli* (nSTEC) from Healthy Food Animals and Their Environment — SHIVASHARANAPPA NAYAKVADI, Dhananjay Desai, Shivaramu Keelara, Paula.J. Fedorka-Cray, Chethan Kumar HB, Eaknath B Chakurkar, Visiting Scholar, Raleigh, NC, USA

P2-240 Incidence of Coagulase-positive Staphylococci and *Staphylococcus aureus* on Flies from Cattle Sources — LUYAO ZHAO, Jinru Chen, Department of Food Science and Technology, The University of Georgia, Griffin, GA, USA

P2-241 Whole Genome Sequence Analysis of Seven Broad Host Range *Salmonella enterica* bacteriophages — SUDHAKAR BHANDARE, Anna Colavecchio, Jean-Guillaume Emond-Rheault, Jeremie Hamel, Irena Kukavica-Ibrulj, Brian Boyle, Roger Levesque, Lawrence Goodridge, McGill University, Ste-Anne-de-Bellevue, QC, Canada

Dairy

P2-242 Addition of Probiotics Affects the Physicochemical and Microbiological Properties of Yogurt Made from Soy Milk and Cow's Milk during Refrigerated Storage — Li Cui, Sam Chang, YAN ZHANG, Ramakrishna Nannapaneni, Mississippi State University, Pascagoula, MS, USA

P2-243 Evaluation of Two Prototypes of Intelligent Packaging with a pH Indicator to Determine Spoiled Cow Milk — ANA ROMERO, Marcia Ferreira, Murilo Sanson, Courtney Stewart, Jessica Martin, Kay Cooksey, Clemson University, Clemson, SC, USA

Blue Text – Developing Scientist Competitor

Green Text - Undergraduate Student Competitoror

P2-244 Antimicrobial Susceptibility Monitoring of Bacterial Pathogens Isolated from Korean Black Goat — Woo Kyung Jung, Sook Shin, Chan Lan Kim, Kun Taek Park, YONG HO PARK, Seoul National University, Seoul, South Korea

P2-245 Sporeformer Presence in a Milk Fractionation Process — Kristi Gowans, Reece Larsen, Tina Lin, JEREMY ARBON, Greyden Clark, Frost Steele, Bradley Taylor, Brigham Young University, Provo, UT, USA

P2-246 Determining the Effect of Individual or Combined Protective Cultures on the Growth of *Listeria monocytogenes* and Shiga Toxin-producing *Escherichia coli* in Raw Milk — SULAIMAN ALJASIR, Catherine Gensler, Dennis D'Amico, University of Connecticut, Storrs, CT, USA

P2-247 Detection of *Listeria* spp. in Unpasteurized Retail Dairy Products in Maine — DHAFER ALSHAIBANI, Jennifer Perry, University of Maine, Orono, ME, USA

P2-248 A Comparative Evaluation of the GENE-UP *Listeria monocytogenes* Assay for the Detection of *Listeria monocytogenes* in Whey Powder-Unit Dose Format — JOHN MILLS, Stan Bailey, Deborah Briese, Ron Johnson, Michelle Keener, Patricia Rule, Nikki Taylor, bioMérieux Inc., Hazelwood, MO, USA

P2-249 Occurrence and Antimicrobial Resistance Patterns of *Escherichia coli* O157:H7 and Non-Typhoidal *Salmonella* in Milk and Feces of Lactating Dairy Cows and Camels in Borana, Southern Ethiopia — Diriba Hunduma, Silvia Alonso, Getahun Agga, Oudessa Kerro Dego, Barbara Wieland, Hiwot Desta, Delia Grace, KEBEDE AMENU, Addis Ababa University, Bishoftu, Ethiopia

P2-250 The Evaluation and Implementation of Two Automated Enzyme-linked Fluorescent Assays for the Detection of *Salmonella* and *Listeria monocytogenes* from Large Gram Size Dairy Samples — ASHLEY ENGEL, Jennifer Bipes, Patricia Rule, Stan Bailey, First District Association, Litchfield, MN, USA

P2-251 Fast (under 19 minutes) Fully-automated or Medium-throughput Semi-automated Multi-contaminant Screening of Milk Samples with the Evidence Series Biochip Analysers — J. Mahoney, K. Crossey, J. Porter, D. Hamm, M.L. Rodríguez, R.I. McConnell, S.P. Fitzgerald, RACHEL FULLERTON, Randox Food Diagnostics, Crumlin, United Kingdom

P2-252 Microbiological Safety of Pulses-based Fermented Foods Developed and Prepared in the Laboratory — Oluwatosin Ademola Ijabadeniyi, Amina Yusuf, Mellisa Jula, AJIBOLA OYEDEJI, Durban University of Technology, Durban, South Africa

P2-253 Comparison of the Bac*gene Listeria* spp. Real-time PCR and BAX System 24E Genus *Listeria* PCR Methods for the Detection of Genus *Listeria* in Food and Environmental Samples from Two Dairy Production Facilities — DANIEL DEMARCO, Colin O'Malley, Roger Hooi, Anita Gerung, Douglas Marshall, Jennifer Willig, Eurofins, Louisville, KY, USA

P2-254 16S rRNA Analysis of Bacterial Genera Present on Wooden Boards at Different Depths from Several Cheese-aging Facilities — KIRTY WADHAWAN, Scott A Rankin, Garret Suen, Charles Czuprynski, University of Wisconsin- Madison, Department of Pathobiological Sciences, Madison, WI, USA

P2-255 The Safety of Raw Milk Cheese and Raw Milk Used for Cheese-making in Ireland — KIERAN JORDAN, Antonio Lourenco, Martin Danaher, Mary Moloney, Teagasc, Fermoy, Ireland

P2-256 Source Tracking and Succession of Microbial Communities during the Production of a Farmstead Cheese — LANG SUN, Dennis D'Amico, University of Connecticut, Storrs, CT, USA

P2-257 Assessing Growth and Survival of *Listeria monocytogenes* in Wash Solutions Used in Artisanal Washed Rind Cheese Production — ROSALIND NEALE, Catherine Donnelly, University of Vermont, Burlington, VT, USA

P2-258 Differential Growth of *Listeria monocytogenes* in Soft Ripened Cheeses at Refrigerated Temperatures — JUSTIN FALARDEAU, Siyun Wang, Food, Nutrition and Health, University of British Columbia, Vancouver, BC, Canada

P2-259 Understanding of Microbial Communities Potentially Associated with Quality and Safety in Cheddar, Provolone and Swiss Cheeses — Jungmin Choi, Sang In Lee, Sushumna Canakapalli, Bryna Rackerby, Ian Moppert, SI HONG PARK, Oregon State University, Corvallis, OR, USA

P2-260 Modelling Population Dynamics of *Listeria monocytogenes* Strain in Lactic Soft Cheese Following Acid and Osmotic Stress Exposures — Thulani Sibanda, ELNA BUYS, University of Pretoria, Pretoria, South Africa

P2-261 Impact of Use of Natural Whey Starter on the Microbiological Characteristics of Artisanal Brazilian Canastra Cheese during Ripening — Cynthia Jurkiewicz, Vanice Natera, Giovanna F. Ripari, Julia Bevilacqua, Vanessa Occhipinti, Raquel Oliveira, MARIZA LANDGRAF, Uelinton Manoel Pinto, Gustavo Augusto Lacorte, Christian Hoffmann, Bernadette DGM Franco, Food Research Center, Faculty of Pharmaceutical Sciences, University of São Paulo, São Paulo, Brazil

P2-262 Diversity of Oxacillin-Resistant *Staphylococcus aureus* Isolated from Cheese — CAROLINA CHAVES, César Rodríguez, Melissa Montenegro, Irina Piedra, Marta Perez, Maria Laura Arias, CIET, San Jose, Costa Rica

NOTES

WEDNESDAY POSTERS
8:30 AM – 3:30 PM

P3 POSTER SESSION 3

Beverages and Acid/Acidified Foods
Food Chemical Hazards and Food Allergens
Food Toxicology
Laboratory and Detection Methods
Meat, Poultry and Eggs
Microbial Food Spoilage
Packaging
Seafood
Water

Kentucky International Convention Center, Exhibit Hall

P3-01 through P3-145 – Authors present 9:00 a.m. – 11:00 a.m.

P3-146 through P3-255 – Authors present 1:00 p.m. – 3:00 p.m.

Food Toxicology

P3-01 Genetic Analysis of Natural Microflora in Stored Joraengyi Rice Cakes and Their Capability for Propionic Acid Production — HEEDAE PARK, Jung Kyu Chae, Iqbal Hossain, Sazzard Hossen Toushik, Ha Lim Jeong, Sang-Do Ha, Advanced Food Safety Research Group, Brain Korea 21 Plus, Chung-Ang University, Ansung, South Korea

P3-02 Mass Spectrometry Analysis for Evaluation of Gluten Residues in Wheat Beers — WANYING CAO, Joseph Baumert, Melanie Downs, University of Nebraska-Lincoln, Lincoln, NE, USA

P3-03 The Application of Enzymatic Histamine Assay for Fermented Foods — Kazuhiko Shimoji, MIKIO BAKKE, Kikkoman Biochemifa Company, Noda, Japan

P3-04 Mitigation Strategies for Acrylamide in Bread — CARLOS BRANDÃO, Cátia Morgado, Inês Coelho, Inês Henriques, Isabel Castanheira, Manuela Guerra, Nelson Félix, Patricia Bernardo, Susana Jesus, Estoril Higher Institute for Tourism and Hotel Studies, Estoril, Portugal

P3-05 Single Kernel Aflatoxin and Fumonisin Levels in Commercial Corn from Texas with Different Bulk Mycotoxin Levels — RUBEN CHAVEZ, Xianbin Cheng, Timothy Herrman, Matthew J. Stasiewicz, University of Illinois at Urbana-Champaign, Urbana, IL, USA

P3-06 Significance of Anti-heat Processed Milk Antibody on ELISA-based Detection in a Dark Chocolate Matrix — ANN NGUYEN, Kristina Williams, Daniel Lee, Lauren Jackson, Binaifer Bedford, Jihyum Kwon, Peter Scholl, Sefat Khuda, U.S. Food and Drug Administration, Laurel, MD, USA

P3-07 Quality Characteristics and Aflatoxin Contents of Homemade Doenjang (Korean Traditional Fermented Soybean PCaste) — So Yeong Ryu, SANG YOO LEE, Seongeun Heo, Sheen-Hee Kim, Gil Jin Kang, Hyang Sook Chun, Advanced Food Safety Research Group, BK21 Plus, School of Food Science and Technology, Chung-Ang University, Anseong, South Korea

P3-08 Occurrence and Exposure Analysis of Deoxynivalenol, Nivalenol and Their Glucosides in Cereal and Cereal-based Foods in Korea — SANG YOO LEE, So Young Woo, Su Kyung Jang, Sheen-Hee Kim, Gil Jin Kang, Hyang Sook Chun, Advanced Food Safety Research Group, BK21 Plus, School of Food Science and Technology, Chung-Ang University, Anseong, South Korea

P3-09 Combined Effects of Temperature and Oxidative Stress on the Growth, Aflatoxin Production, and Gene Expression of *Aspergillus flavus* — FEI TIAN, Sang Yoo Lee, So Young Woo, Gun Hee Cho, Hyang Sook Chun, Advanced Food Safety Research Group, BK21 Plus, School of Food Science and Technology, College of Biotechnology and Natural Resources, Chung-Ang University, Anseong, South Korea

P3-10 Effects of Nzu (Calabash Clay) on Mineral and Aflatoxin Contents in Cows' Milk from Abeokuta, Nigeria — AMINA BADMOS, Flora Oluwafemi, Federal University of Agriculture Abeokuta Ogun State, Nigeria, Abeokuta, Nigeria

P3-11 Effect of Storage Techniques on Aflatoxin Load in Maize Ogi from Uyo Metropolis, Akwa Ibom State, Nigeria — ADENIYI SANYAOLU, Inemesit Bassey, Humprey Udofot, Nyakno Willey, University of Uyo, Uyo, Nigeria

P3-12 Aflatoxin Production by *Aspergillus flavus* and *Aspergillus parasiticus* on Nyjer Seed Cake — CHIH-HSUAN CHANG, W.T. Evert Ting, Dawit Gizachew, Purdue University Northwest, Hammond, IN, USA

P3-13 Reduction of Ochratoxin a in Rice and Oat Porridge by an Indirect Steaming Process with Baking Soda — HYUN JUNG LEE, Kejia Gu, Shufang Li, Dojin Ryu, University of Idaho, Moscow, ID, USA

Laboratory and Detection Methods

P3-14 Detection of *Salmonella* Typhimurium in Pooled Environmental Sponge Swab Enrichment Cultures Using the bioMérieux VIDAS SLM and Easy SLM Immunoassays and the FDA BAM Culture Method — Ryan Zimmerman, LeAnne Hahn, Sue Kelly, LAURIE POST, Brian Farina, Charles Deibel, Patricia Rule, Stan Bailey, John Mills, Deibel Laboratories, Inc., Bethlehem, PA, USA

P3-15 Test for Detection of *Listeria* spp. from Environmental Surfaces without Enrichment — NAWAL BAKIR, Quynh-Nhi Le, Preetha Biswas, Brooke Roman, Mark Mozola, Robert Donofrio, Benjamin Bastin, Nicole Klass, Patrick Bird, Neogen Corporation, Lansing, MI, USA

P3-16 Evaluation of the Certus Environmental *Listeria* spp. Detection Kit for the Detection of *Listeria* spp. on Environmental Surfaces: AOAC Performance Tested Method 101802 — JOHN BODNER, Benjamin Bastin, Nicole Klass, Erin Crowley, CERTUS Food Safety, Chicago, IL, USA

P3-17 Qualitative Comparison of Environmental Swabbing Devices for Recovery of *Listeria monocytogenes* from Stainless Steel — ARLETTE SHAZER, Joelle K. Salazar, Diana Stewart, Mary Lou Tortorello, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-18 Use of 3M Molecular Detection Assays for Detection of *Salmonella* spp., *E. coli* O157:H7 and *Listeria monocytogenes* in Fresh Spinach and Environmental Samples — Erick Reyes, Fabiola Ramirez, Angel Trejo, Alejandro Arriaga, GUSTAVO GONZÁLEZ-GONZÁLEZ, Maltie Erandy Cabello-Aceves, Angélica Alejandra De la Torre-Anaya, 3M Food Safety México, Guadalajara, Mexico

P3-19 In-house Validation of a Loop Mediated Isothermal Amplification (LAMP)-Bioluminescent Technology for the Detection of *Listeria* spp. and *Salmonella* spp. in Three Different Matrices — Olivia Lugo-Magaña, Nallely Saucedo-Briviesca, Adrián Rojas-Ávila, Brenda Arianna Sánchez-Vera, Abigail Castro-Juárez, Carlos Sepúlveda-Ibarra, GUSTAVO GONZÁLEZ-GONZÁLEZ, 3M Food Safety México, Guadalajara, Mexico

P3-20 Independent Validation of a Proprietary Service-based Method for Detection and Identification of *E. coli* O26, O45, O103, O111, O121, O145 and O157:H7 — ERIN CROWLEY, Edan Hosking, Brooke Roman, Susan Alles, Susanne Hinkley, Karen Cooper, Danielle Keys, Mark Mozola, Robert Donofrio, Benjamin Bastin, Wesley Thompson, Q Laboratories, Inc., Cincinnati, OH, USA

P3-21 Evaluation of the of the MC-Media Pad Yeast and Mold Device for the Enumeration of Yeast and Mold: A Collaborative Study — ERIN CROWLEY, Benjamin Bastin, Dane Brooks, James Agin, David Goins, Charlotte Lindhardt, Renaud Chollet, Q Laboratories, Inc., Cincinnati, OH, USA

P3-22 Enumeration of Total Aerobic Counts in a Variety of Foods by the MC Media Pad™ Rapid Aerobic Count Device: A Collaborative Study — ERIN CROWLEY, Benjamin Bastin, Nicole Klass, James Agin, David Goins, Charlotte Lindhardt, Renaud Chollet, Q Laboratories, Inc., Cincinnati, OH, USA

P3-23 Evaluation of the GENE-UP® SLM for the Detection of *Salmonella* spp. in Various Chocolate Products — JOY DELL'ARINGA, John Mills, Stan Bailey, Erin Crowley, Benjamin Bastin, Nicole Klass, bioMérieux Inc., Hazelwood, MO, USA

P3-24 Evaluation of the Biomérieux VIDAS/GENE-UP® Top7 Shiga Toxin-producing *E. coli* Detection System — ROBERT BARLOW, Kate McMillan, CSIRO Agriculture & Food, Brisbane, Australia

P3-25 Evaluation of the GENE-UP *Cronobacter* spp. Assay for the Detection of *Cronobacter* from Environmental Surfaces (Stainless Steel and Plastic) — Nikki Taylor, John Mills, Ron Johnson, PATRICIA RULE, Stan Bailey, Vikrant Dutta, bioMérieux Inc., Hazelwood, MO, USA

P3-26 Performance Evaluation of 3M Molecular Detection Assay 2 – *Campylobacter* for Detection of *Campylobacter* spp. in Unpasteurized Milk Products and Poultry Matrices — ELAINE CHIU, Olga Sagatu, Vaishali Saliya, Sarah Tutua, John Fam, Eurofins Food Analytics NZ Ltd., Auckland, New Zealand

P3-27 Characterization of Bacteriophage Targeting *Citrobacter* spp., *Escherichia coli*, and *Klebsiella oxytoca* Used in a Selective *Salmonella* Enrichment Broth by Transmission Electron Microscopy and Whole Genome Sequencing — MARK MULDOON, Vera Gonzalez, Meredith Sutzko, Shannon Modla, Shawn Polson, Brewster Kingham, Romer Labs, Inc., Newark, DE, USA

P3-28 Development of a Next Generation Sequencing Workflow for Food DNA Analysis: How to Identify Meat and Fish Species in Complex Food Products — AMANDA MANOLIS, Sofia Nogueira, Mario Gadanho, Sandra Chaves, Tiina Karla, Thermo Fisher Scientific, Austin, TX, USA

P3-29 Thermo Scientific Brilliance Campycount Enumeration Method Microval Validation in Comparison to EN ISO 10272-2:2017 in Accordance with ISO 16140-2:2016 — AMANDA MANOLIS, Jessica Williams, Ana-Maria Leonte, Gail Betts, Thermo Fisher Scientific, Austin, TX, USA

P3-30 Thermo Scientific *Listeria* Precis Enumeration Method: NF Validation EN ISO 16140-2:2016 — AMANDA MANOLIS, Jessica Williams, Ana-Maria Leonte, Françios Le Nestour, Thermo Fisher Scientific, Austin, TX, USA

P3-31 Thermo Scientific Brilliance Staph 24 Enumeration Method Microval Validation ISO 16140-2:2016 — AMANDA MANOLIS, Jessica Williams, Ana-Maria Leonte, Gail Betts, Thermo Fisher Scientific, Austin, TX, USA

P3-32 Thermo Scientific *Listeria* Precis Detection Method: NF Validation EN ISO 16140-2:2016 — AMANDA MANOLIS, Ana-Maria Leonte, Maryse Rannou, Muriel Bernard, Jessica Williams, Thermo Fisher Scientific, Austin, TX, USA

P3-33 Thermo Scientific Suretect *Cronobacter* Species PCR Assay: NF Validation Using the Applied Biosystems Quantstudio 5 PCR Instrument — AMANDA MANOLIS, Liz Harrison, Ana-Maria Leonte, Jessica Williams, Maryse Rannou, Muriel Bernard, Thermo Fisher Scientific, Austin, TX, USA

P3-34 Thermo Scientific Suretect *E. coli* O157:H7 PCR Assay: AOAC-RI PTM Validation Using the Applied Biosystems Quantstudio 5 PCR Instrument — AMANDA MANOLIS, Jessica Williams, Liz Harrison, Benjamin Bastin, Thermo Fisher Scientific, Austin, TX, USA

P3-35 Thermo Scientific Suretect *Listeria monocytogenes* Assay: AOAC-RI PTM and NF Validation Using the Quantstudio 5 PCR Instrument — AMANDA MANOLIS, Ana-Maria Leonte, Maryse Rannou, Muriel Bernard, Jessica Williams, Benjamin Bastin, Thermo Fisher Scientific, Austin, TX, USA

P3-36 Improved *Salmonella* Detection from Primary Production Samples Using Multiplex PCR Methodology — Charlotte Cooper, Katharine Evans, David Crabtree, Annette Hughes, AMANDA MANOLIS, Thermo Fisher Scientific, Austin, TX, USA

P3-37 Superior Detection of Multiple *Salmonella* Serovars from Meat and Environmental Samples Using a Multiplex PCR Method — Charlotte Cooper, Katharine Evans, David Crabtree, Annette Hughes, AMANDA MANOLIS, Thermo Fisher Scientific, Austin, TX, USA

P3-38 Aptamer-based Platform for Optical Detection of *Salmonella* Enteritidis — ALEXANDER MILLS, Lili He, University of Massachusetts Amherst, Amherst, MA, USA

P3-39 Validating a Method for Multiplex Screening of *Salmonella* Mutants for Survival on Dry Surfaces — OURANIA RAFTOPOULOU, Victor Jayeola, Steffen Porwollik, Weiping Chu, Michael McClelland, George-John Nychas, Sophia Kathariou, Agricultural University of Athens, Athens, Greece

P3-40 ISO 16140-2 (2016) Validation of Genedisc for the Detection of Shiga Toxin-producing *Escherichia coli* from O157, O111, O26, O103 and O145 Groups — Justine Baguet, Cécile Bernez, SABRINA MACE, Nicolas Nguyen Van Long, Christophe Quere, Maryse Rannou, ADRIA Food Technology Institute - UMT14.01 SPORE RISK, Quimper, France

P3-41 Prevalence and Characterization of Thermophilic Sporeformers in French Dairy Powders — Louis Delaunay, SABRINA MACE, Emeline Cozien, Florence Postollec, Ivan Leguerinel, Anne-Gabrielle Mathot, ADRIA Food Technology Institute - UMT14.01 SPORE RISK, Quimper, France

P3-42 Strains Used as Biopesticides from Foodborne Contaminants — Emeline Cozien, Pierre Gehannin, Nassim Mouhali, Nadine Henaff, SABRINA MACE, Anne-Gabrielle Mathot, Florence Postollec, ADRIA Food Technology Institute - UMT14.01 SPORE RISK, Quimper, France

P3-43 ISO 16140-2 (2016) Validation of RAPID'*B. cereus* Method for the Enumeration of Presumptive *Bacillus cereus* group in Dairy Products, Ready to Eat and Ready to Reheat Products and Cereals, Spices, Dehydrated Fruits and Vegetables — Lila Lefebvre, Nicolas Nguyen Van Long, Sarah Peron, FLORENCE POSTOLLEC, Maryse Rannou, ADRIA - UMT ACTIA19.03 ALTER'iX, Quimper, France

P3-44 Development of Standards for Conducting Microbiological Challenge Tests for Food and Feed Products (ISO 20976) — Hélène Bergis, Gail Betts, Rachel Binet, Patrick Bird, Sara Bover-Cid, Frederique Cantergiani, Louis Coroller, Heidy Den Besten, Mariem Ellouze, Elisa Goffredo, Gretchen Gutierrez, Véronique Huchet, Paul in't Veld, Luigi Lanni, Yvan Le Marc, Jeanne-Marie Membre, Elisabeth Payeux, Stella Planchon, ADRIA - UMT ACTIA19.03 ALTER'iX, Quimper, France

P3-45 *Salmonella* Typhimurium-specific Signatures as Targets for Detection by Using DNA Aptamers in Foods and the Environment — AZRINA NAWAWI, Srinand Sreevatsan, Michigan State University, East Lansing, MI, USA

P3-46 Amplified Nucleic Acid Single Temperature Reaction for Detection of Genogroup II Human Norovirus — JEREMY FAIRCLOTH, Edan Hosking, Eric Tovar, Lee-Ann Jaykus, North Carolina State University, Raleigh, NC, USA

P3-47 Assessment and Comparison of Molecular Subtyping and Characterization Methods for *Salmonella* — SILIN TANG, Renato Orsi, Hao Luo, Chongtao Ge, Guangtao Zhang, Robert Baker, Martin Wiedmann, Mars Global Food Safety Center, Beijing, China

P3-48 Detection of *Salmonella* spp. and *Listeria monocytogenes* in Artificially Contaminated Processed Egg Products Using the Assurance GDS Pathogen Detection System — KHYATI SHAH, Khanh Soliven, Tim Kelly, Andrew Lienau, Lisa John, Millipore-Sigma, Bellevue, WA, USA

P3-49 Use of the Assurance® GDS EHEC ID Assay to Genetically Confirm *E. coli* O157:H7-Positive Contaminated Beef and Carcass Cloth Samples According to the Newly Revised USDA FSIS EHEC Definition — KHYATI SHAH, Ta Deng, Andrew Lienau, Markus Jucker, Lisa John, MilliporeSigma, Bellevue, WA, USA

P3-50 Performance Comparison of Shiga Toxin-producing *E. coli* Multiplex Molecular Assays — JANI HOLOPAINEN, Laura Vaahtoranta, Hanna Lehmusto, Emmi Hurskainen, Jonna Roivanen, Suvi Airikka, Ahmed Al-Mosawi, Charlotte Cooper, Amanda Manolis, Dean Leak, Nina Wickstrand, Thermo Fisher Scientific, Vantaa, Finland

P3-51 Validation of a Novel Loop-mediated Isothermal Amplification Method for the Detection of *Salmonella* Enteritidis in Shell Eggs — LIJUN HU, Melanie Butler, Li Ma, Thomas Hammack, Eric Brown, Guodong Zhang, U.S. Food and Drug Administration, College Park, MD, USA

P3-52 Development of a Colorimetric Loop-mediated Isothermal Amplification Assay Using Molecular Beacon HRP-Mimicking for the Rapid Detection of *Listeria* spp. in Mushrooms — JEONG-EUN LEE, Sol-A Kim, Hyo-In Kim, Won Bo Shim, Gyeongsang National University, Jinju, South Korea

P3-53 Rapid Detection of *Campylobacter* in Poultry Matrices Using a Loop-mediated Isothermal Amplification (LAMP)–Bioluminescent Assay — Jerri Lynn Pickett, Melissa Sisemore, Jamie Goseland, Jesse Goseland, Christina Barnes, John David, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

WEDNESDAY

Blue Text - Developing Scientist Competitor

Green Text - Undergraduate Student Competitor

P3-54 Comparative Evaluation of the Ready-to-Use 3M *Campylobacter* Enrichment Broth and the 3M Molecular Detection Assay 2 – *Campylobacter* for the Detection of *Campylobacter* in a Variety of Poultry Matrices — Leslie Thompson-Strehlow, Nathan Clemens, Hannah Bakken, Christina Barnes, Lisa Monteroso, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

P3-55 Rapid Detection of *stx1, stx2* and *Eae* from Shiga Toxin-producing *Escherichia coli* in Meat, Produce and Raw Dairy Samples Using Loop Mediated Isothermal Amplification and Bioluminescence Detection — Christina Barnes, Neil Percy, Tonya Bonilla, Cynthia Zook, Lisa Monteroso, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

P3-56 Performance Evaluation of a Loop-mediated Isothermal Amplification-Bioluminescent Assay for Rapid Detection of *Salmonella* spp. in Boot Swabs and Animal Feed from Brazil — Vanessa Tsuhako, Pedro Beretta, Daiane Martini, Andréia Maroli, Sidiane Castanha, Douglas Rizzotto, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

P3-57 Performance Evaluation of a Loop-mediated Isothermal Amplification-Bioluminescent Assay for Rapid Detection of *E. coli* O157 in Brazilian Raw Beef and Hamburger Patties. — Vanessa Tsuhako, Danielle Almeida, Maria Thereza Moura, Camila Cristina Bernardoni, Vanessa Erika Murai, Amanda Letícia Silva, Patrícia de Freitas Pereira, Ana Cláudia Bernardoni, RAJ RAJAGOPAL, 3M Food Safety, St. Paul, MN, USA

P3-58 Performance Evaluation of a Fluorescence Resonance Energy Transfer Based Real-time PCR in a Unit Dose Format (SLM2) for the Detection of *Salmonella* spp. in 375 g Dark Chocolate — Deborah Briese, Peter Ladell, Ron Johnson, John Mills, Stan Bailey, VIKRANT DUTTA, bioMérieux Inc., Hazelwood, MO, USA

P3-59 Withdrawn

P3-60 Surface Plasmon Resonance-based *Salmonella* Typhimurium Detection Using Antibody-linked Magnetic Nanoparticles for Capturing, Purification, and Signal Amplification — DEVENDRA BHANDARI, Fur-Chi Chen, Tennessee State University, Nashville, TN, USA

P3-61 Sensitivity of Petrifilm Staph Express Count Plate for Enumeration of *Staphylococcus aureus* in Various Foods — JIMYEONG HA, Yoonjeong Yoo, Yuna Choi, Byoung-Ik Sohn, Hyun-Jo Bang, Seung-Ho Choi, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P3-62 Characterization and Analysis of *Campylobacter F*lagellin Protein Using a Panel of Monoclonal Antibodies — SHREYA SINGH HAMAL, Fur-Chi Chen, Tennessee State University, Nashville, TN, USA

P3-63 Quality Indicator Testing of Chocolate and Other Confectionery Products with the TEMPO® Automated Enumeration System — JOHN MILLS, Joy Dellaringa, bioMérieux Inc., Hazelwood, MO, USA

P3-64 A Comparative Evaluation of the GENE-UP *Listeria* spp. Assay for the Detection of *Listeria* Species in Deli Ham and on Stainless Steel Environmental Surfaces Unit Dose Format — JOHN MILLS, Stan Bailey, Deborah Briese, Vikrant Dutta, Ron Johnson, Michelle Keener, Patricia Rule, Nikki Taylor, bioMérieux Inc., Hazelwood, MO, USA

P3-65 Performance of 3M Petrifilm Rapid Aerobic Count Plates for Determining Aerobic Counts in Cocoa Products in Comparison to the Traditional Culture Method — Dariel Intriago-Bermúdez, Anyi Gutierrez-Sterling, Sheyla Yali, CARI LINGLE, 3M Food Safety, St. Paul, MN, USA

P3-66 Performance of Rapid Enumeration Methods for Lactic Acid Bacteria in Cured Meat Products from Brazil — Vanessa Tsuhako, Danielle Almeida, Maura Chiapinotto, Alceu Marafon, Sandra Heidtmann, CARI LINGLE, 3M Food Safety, St. Paul, MN, USA

P3-67 Performance of a Rapid *E. coli* Enumeration Method in Brazilian Dairy Products — Vanessa Tsuhako, Pedro Beretta, Fabiana Ferreira, Tiago Olegário, Patrícia Bloemker, CARI LINGLE, 3M Food Safety, St. Paul, MN, USA

P3-68 Evaluation of an Alternative Method for Enumeration of Lactic Acid Bacteria in Brazilian Bacon — Lara Maria Vieira Flores Carvalho, Caio Fialho de Freitas, Cristina De Abreu Constantino, Luís Augusto Nero, CARI LINGLE, 3M Food Safety, St. Paul, MN, USA

P3-69 Elimination of Sampling Error through Comminution of Food — Cameron Owens, Nicole Mitchell, Patricia Hanson, Jason Crowe, Diane Pickett, LYNDSEY CAULKINS, Florida Department of Agriculture and Consumer Services, Tallahassee, FL, USA

P3-70 One-Step Enrichment Broth for the Simultaneous Recovery of *Salmonella enterica* and *Cronobacter sakazakii* in Powdered Infant Formula — AFIA BOUMAIL, Anne Helmer, Marie Goreth Nicizanye, Anna Yattara, Michael Giuffre, Sergiy Olishevskyy, FoodChek Laboratories Inc., Sainte-Julie, QC, Canada

P3-71 Evaluation of the Universal Enrichment Broth *Salmonella*, *Staphylococcus*, *Shigella*, *Listeria* and *E. coli* for the Detection of the Main Food Pathogens in Cheeses — Josée Houle, KARINE SEYER, Vincent Martineau, Canadian Food Inspection Agency, St-Hyacinthe, QC, Canada

P3-72 Selective Supplement for One-Step Enrichment of Low Numbers of Sublethally Stressed *Salmonella* in the Presence of Competitive Flora — JEAN-FELIX SICARD, Mounia Akassou, Elva De la Rosa, Anna Galitcaia, Michael Giuffre, Sergiy Olishevskyy, FoodChek Laboratories Inc., Sainte-Julie, QC, Canada

P3-73 Rapid Quantitative Enumeration of *E. coli* and Coliforms in Foods — SAILAJA CHANDRAPATI, Cari Lingle, Haley Saddoris, 3M Food Safety, St. Paul, MN, USA

P3-74 Rhamnose-substituted Buffered *Listeria* Enrichment Broth Increases *Listeria monocytogenes* Enrichment Populations in Select Seafood Matrices — RONALD SMILEY, U.S. Food and Drug Administration/ORA/Arkansas Laboratory, Jefferson, AR, USA

P3-75 Evaluation of the 3M Petrifilm Rapid *E. coli*/Coliform Count Plate and 3M Petrifilm Rapid Aerobic Count Plate for Enumeration Microorganisms in Raw Milk Samples in Thailand — SOMCHAI WONGSAMOOT, Paruch Kunprom, Kotchaphan Bowonchairit, Panida Pisaisawat, Nongnuch Promla, Wanida Mukkana, Wipa Kongsakul, Yodlak Saengprao, Bureau of Quality Control of Livestock Products, Department of Livestock Development, Bangkok, Thailand

P3-76 Development of an Amperometric Biosensor Integrated with Biotinylated Bacteriophages as Novel Sandwich Biorecognition Elements for the Detection of Shiga Toxin-producing *Escherichia coli* — IRWIN QUINTELA, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P3-77 Direct and Rapid Detection of Shiga Toxin-producing — IRWIN QUINTELA, Vivian Chi-Hua Wu, Western Regional Research Center, Agricultural Research Service, USDA, Albany, CA, USA

P3-78 Construction of a GFP-tagged *Listeria innocua* Strain for Use in Detection of Cross-Contamination in Food Testing Laboratories — SAMUEL ELLIS, Christopher Kvaal, St. Cloud State University, St. Cloud, MN, USA

P3-79 Comparing Anaerobic Systems, Culture Vessels and Initial Temperature of Enrichment Broth in the Recovery of *Shigella flexneri* from a High Background Level Food Type — OLUWASEUN AGBAJE, Clinton Thompson, Robert Duvall, Rachel Binet, U.S. Food and Drug Administration, College Park, MD, USA

P3-80 Optimizing the Recovery of Wild Type *Shigella* from High Background Level Food Matrices — OLUWASEUN AGBAJE, Clinton Thompson, Robert Duvall, Rachel Binet, U.S. Food and Drug Administration, College Park, MD, USA

P3-81 Compatibility of Polymorphic Locus Sequence Typing with Commercially Available Environmental Sampling Tests for *Listeria* and *Salmonella* — Tom Edlind, YANHONG LIU, U.S. Department of Agriculture–ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P3-82 Culture-independent Typing of Foodborne Pathogens in Poultry Products — Tom Edlind, YANHONG LIU, U.S. Department of Agriculture–ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P3-83 Detection and Antibiotic Resistance Determination of *Campylobacter* in Milk Using Colorimetric-based Microfluidic "Lab-on-a-Chip" Device — LUYAO MA, Marlen Petersen, Xiaonan Lu, Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, BC, Canada

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P3-84 Detection of Botulinum Neurotoxins A, B, E and F in Fifteen Selected Problematic Food Matrices Using the Endopeptidase-Mass Spectrometry Assay — TRAVIS MORRISSEY, Viviana Aguilar, Kristin M. Schill, N. Rukma Reddy, Guy Skinner, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-85 Detection of Mislabeled Canned Seafood Products Using DNA Barcoding — SARAH STADIG, Jonathan Deeds, Amanda Windsor, U.S. Food and Drug Administration, College Park, MD, USA

P3-86 Detection of Staphylococcal Enterotoxins A and B in Chicken Salad with RIDASCREEN and VIDAS Methods — HOSSEIN DARYAEI, Shannon Pickens, Matthew Kmet, Tara Doran, Donald Burr, Ravinder Reddy, Illinois Institute of Technology/IFSH, Bedford Park, IL, USA

P3-87 Development of a Molecular Serotyping Assay for *Escherichia coli* Via Targeted Sequencing of the O-Antigen Gene Cluster — JACOB ELDER, Pina Fratamico, Yanhong Liu, Lori Bagi, Robert Tebbs, Adam Allred, Prasad Siddavatam, Krishna Reddy Gujjula, Haktan Suren, Chirita DebRoy, Edward Dudley, David Needleman, Xianghe Yan, U.S. Department of Agriculture–ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P3-88 Development of an Integrated Detection Platform for the In-Process Surveillance of *Listeria* spp. In Environmental Monitoring Samples — BEATRIZ QUIÑONES, Veronica DeGuzman, Jaszemyn Yambao, David Medin, Bertram Lee, U.S. Department of Agriculture-ARS-WRRC-PSM Unit, Albany, CA, USA

P3-89 Differentiation and Screening of Foodborne Bacterial Pathogen Strains Using Colorimetric Gold Nanoparticles — HONGSHENG HUANG, Jacob Rogowski, Lina Liu, Marc-Olivier Duceppe, Sanaz Karami, Marlena Scaffidi, Paul Chen, Frank Gu, Ottawa Laboratory – Fallowfield, Canadian Food Inspection Agency, Ottawa, ON, Canada

P3-90 ID Fungi Plates and Mass Spectrometry Complement Each Other to Facilitate Mold Identification — Semcheddine Cherrad, Markus Kostrzewa, Katharina Mucek, DANIELE SOHIER, Markus Timke, Sebastien Vacher, Bruker, Bremen, Germany

P3-91 Reproducibility of MALDI-TOF MS for Pathogen Confirmation and Identification of Non-pathogenic Bacterial Isolates: Assessment According to the AOAC Guidelines — Benjamin Bastin, Patrick Bird, Erin Crowley, Claudie Le Doeuff, Sarah Peron, Maryse Rannou, DANIELE SOHIER, Markus Timke, Bruker, Bremen, Germany

P3-92 A Rapid, Simultaneous and Simple Method for the Detection of *Salmonella* and *Escherichia coli* in Wheat Flour — FEREIDOUN FORGHANI, David A. Mann, Shaokang Zhang, Xiangyu Deng, Henk den Bakker, Francisco Diez-Gonzalez, University of Georgia, Center for Food Safey, Griffin, GA, USA

P3-93 Inkjet Printed Nano-patterned Aptamer-based Sensors for Improved Optical Detection of Foodborne Pathogens — SUSANA DIAZ-AMAYA, Min Zhao, Li-kai Lin, Jan Allebach, George Chiu, Amanda Deering, Lia Stanciu, Purdue University, West Lafayette, IN, USA

P3-94 Colorimetric Detection of *Clostridium perfringens* in a Model Meat System Using Paper-based Microfluidics — CODI JO BROTEN, John B. Wydallis, Thomas Reilly, III, Bledar Bisha, University of Wyoming, Laramie, WY, USA

P3-95 Evaluation of *Salmonella* and Shiga Toxin-producing *Escherichia coli* Presence in Various Pet Foods Using Rapid PCR-based Assay as Pre-screening Method — AYODEJI ADENIYI, Remio Moreira, Darvin Cuellar, Alejandro Echeverry, Texas Tech University, Lubbock, TX, USA

P3-96 Enumeration and Pathotyping of *Escherichia coli* in Agricultural Water — BIYU WU, Jin Dong, Solange Saxby, Yen Nguyen, Lynn Nakamura-Tengan, Yong Li, University of Hawaii at Manoa, Honolulu, HI, USA

P3-97 Development of an Ultra-Sensitive and Specific Multiplex Single-Tube Nested qPCR Assay for Simultaneous Detection of *Campylobacter jejuni* and *Salmonella* spp. — BIYU WU, Yong Li, University of Hawaii at Manoa, Honolulu, HI, USA

P3-98 Quantification and Discovery of PCR Inhibitors Found in Food Matrices Commonly Associated with Foodborne Viruses — CASSANDRA R. SUTHER, Matthew D. Moore, University of Massachusetts, Amherst, Amherst, MA, USA

P3-99 Evaluation of Roka Atlas-based Assay for Major Foodborne Pathogens in Food and Environmental Samples — CHRISTINA M. FERREIRA, Jie Zheng, Elizabeth Reed, Yi Chen, Thomas Hammack, Laila Ali, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

P3-100 From Stools to Water: Contamination of Irrigation Water Using an Artificial Hand Tool Exposed to Stool Samples Containing Oocysts of *Cyclospora cayetanensis* — EMMA PATREGNANI, Mauricio Durigan, Cathy Snider, Chun Wang, Katie Kneupper, Fernando J. Bornay-Llinares, Alexandre daSilva, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

P3-101 Isolation and Identification of Three Gram Negative Bacterial Species from Powdered Infant Formula Using MALDI-TOF Mass Spectrometry and rRNA Sequence Analysis — IRSHAD SULAIMAN, Nancy Miranda, Steven Simpson, U.S. Food and Drug Administration, Atlanta, GA, USA

P3-102 Matrix Extension of a Loop-mediated Isothermal Amplification (LAMP) Assay for Screening *Salmonella* in Raw Pet Food — KELLY DOMESLE, Shenia Young, Beilei Ge, U.S. Food and Drug Administration, Laurel, MD, USA

P3-103 Matrix Impact on the Variation of Test Results and Measurement Uncertainty in Proficiency Testing Data from Milk, Infant Formula and Oyster Samples — SAMANTHA LINDEMANN, Bertrand Colson, Ravinder Reddy, Steffen Uhlig, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-104 Method Performance of Two Aerobic Plate Count Methods in the Longstanding Milk Proficiency Testing Program — RAVINDER REDDY, Samantha Lindemann, Robert Newkirk, Vishnu Patel, Christian Bläul, Kirsten Simon, Steffen Uhlig, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-105 Rapid Detection of *Salmonella* against Other Bacterial Strains Using Hyperspectral Microscope Images — MATTHEW EADY, Bosoon Park, USDA, ARS, Athens, GA, USA

P3-106 Detection of *Salmonella* and *Listeria* from Multiple Dairy Products Using the BAX System Real-time PCR Assays — LESLIE THOMPSON-STREHLOW, Nathan Clemens, Julie Weller, Anastasia Likanchuk, Priyanka Surwade, Stacy Stoltenberg, SGS Vanguard Sciences, North Sioux City, SD, USA

P3-107 Application of Improved Genetically Modified Detection Methods using Screening Multiplex PCR for Authorized Genetically Modified Soybean Processed Food — HYE LIM KWAK, Kyung Yoon Kwon, Kwang Yong Ko, CJ Cheiljedang, Suwon, South Korea

P3-108 Development of a Rapid and Accurate Detection Method for *Listeria monocytogenes* in Golden Needle Mushrooms, Using Quantitative Real-time PCR — SOOMIN LEE, Won-Il Kim, Hyeonheui Ham, Kyoung-Hee Choi, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P3-109 Droplet Digital PCR for Detection of Foodborne Pathogens — JOSEPH CAPOBIANCO, Cheryl Armstrong, Mike Clark, Astrid Cariou, Adelaide Leveau, Sophie Pierre, U.S. Department of Agriculture–ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

P3-110 Development of Sensitive DNA Primers to Detect *Listeria monocytogenes* in *Pleurotus eryngii* Directly after Enrichment by Quantitative Real-time PCR — YEONGEUN SEO, Soomin Lee, Won-Il Kim, Hyeonheui Ham, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P3-111 A Reduced 90 ml Enrichment to Detect *Salmonella* from Environmental Surfaces Using the BAX System — Anastasia Likanchuk, Priyanka Surwade, JULIE WELLER, Victoria Kuhnel, Andrew Farnum, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-112 Validation of the BAX System Real-time PCR Assay for *Salmonella* in Fresh Cut Mango — Anastasia Likanchuk, Victoria Kuhnel, JULIE WELLER, Priyanka Surwade, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-113 Validation of Detection of *Listeria monocytogenes* in 125g Natural Cheese Product by Real-time BAX LM PCR and VIDAS LMO2 Methods — WENDY MCMAHON, Helen Andrews, Jacqui Zimmerman, Cheng Zhang, Upasana Hariram, Mérieux NutriSciences, Crete, IL, USA

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P3-114 A Quantitative Approach Utilizing the BAX System Real-time PCR Assay for *Salmonella* to Estimate Log CFU/Sample in Ground Turkey — TYLER STEPHENS, Julie Weller, April Englishbey, Stacy Stoltenberg, Anastasia Likanchuk, Priyanka Surwade, Victoria Kuhnel, Roy Radcliff, Sally Binder, Dorn Clark, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-115 Comparison between BAX Cycle Threshold Values and Most Probable Number to Estimate Preenrichment Log CFU/ml of *Salmonella* in Pre-Scald and Re-Hang Chicken Rinsates at a Commercial Processing Facility — APRIL ENGLISHBEY, Julie Weller, M. Alexandra Calle, Sebastian Sandoval, Tyler Stephens, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-116 Evaluation of Chlorine Dioxide Gas Treatments against *Salmonella* spp. Artificially Contaminated on Mung Bean Seeds — BASSAM A. ANNOUS, David Buckley, Angela Burke, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P3-117 Efficacy of Propidium monoazide Combined Real-time PCR to Detect Seven Viable Species of Foodborne Pathogens — SUNG-YOUN KIM, Dong-yeon Seo, Ji Young Moon, Dong-ho Kim, Division of Safety Analysis, Experiment & Research Institute National Agricultural Products Quality Management Service, Gimcheon-si, South Korea

P3-118 Evaluation of Alternative Rapid Methods for the Detection of *Salmonella* spp. in Dark Chocolate Using Multiple Incubation Times — CATHARINE CARLIN, Samantha Lau, Zeina Kassaify, Rachel Cheng, Martin Wiedmann, Cornell University, Ithaca, NY, USA

P3-119 Independent Validation for the Polyskope 1.0 Multiplex Pathogen Detection Assay for the Detection of Shiga Toxin-producing *Escherichia coli* Non-O157, *Escherichia coli* O157, *Listeria monocytogenes,* and *Salmonella* Species — PAUL SMITH, Michael Centola, Polyskope Labs, Oklahoma City, OK, USA

P3-120 Rapid Differentiation of Live and Dead Shiga Toxin-producing *E. coli* Using DNA Photo Labeling Combined with PCR — AMY JONES, Keith Schneider, KwangCheol Casey Jeong, Soohyoun Ahn, University of Florida, Gainesville, FL, USA

P3-121 Single Lab Validation for the MPN-Real Time PCR Method for Detection of *Vibrio vulnificus* in Oysters — JOEY MARCHANT, Jessica Jones, U.S. Food and Drug Administration, Gulf Coast Seafood Laboratory, Dauphin Island, AL, USA

P3-122 *Cronobacter sakazakii* ISO 22964:2017 Testing of Milk Powders Using Commercially Available PCR — Karen Hunt, KIERAN JORDAN, Charlene Legeay, Teagasc, Fermoy, Ireland

P3-123 Recovery of *E. coli* O157:H7 by the BAX System in Beef Trim Using Surface Sampling Swabs — JULIE WELLER, Anastasia Likanchuk, Priyanka Surwade, Victoria Kuhnel, Stacy Stoltenberg, Tyler Stephens, April Englishbey, Steven Huang, Eric Wilhelmsen, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-124 Evaluating a High-throughput Targeted Amplicon Sequencing Approach for Simultaneous Detection and Quantitation of Foodborne Bacteria, Viruses and the Parasite *Cyclospora cayetanensis* from Complex Samples — ISHA PATEL, Mark Mammel, Gopal Gopinath, Cathy Snider, Chun Wang, Katie Kneupper, Mauricio Durigan, Emma Patregnani, Hediye Nese Cinar, Alexandre daSilva, U.S. Food and Drug Administration – CFSAN, Laurel, MD, USA

P3-126 Performance Validation of the BAX System Free DNA Cleanup Kit to Eliminate PCR False Positives Caused by External Contaminant DNA — SAI SIDDARTH KALBURGE, Yangyang Wang, Andrew Farnum, Indira Padmalayam, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-127 Development of a New BAX® System Real-time *E. coli* O157:H7 Single Target PCR Assay — SAI SIDDARTH KALBURGE, Yangyang Wang, Andrew Farnum, Indira Padmalayam, Qualicon Diagnostics LLC, A Hygiena Company, New Castle, DE, USA

P3-128 Development of a PCR-typing Method for the Identification of *Salmonella* Serotypes — HAE-YEONG KIM, Soo-Mi Eum, Gyoungju Nah, Hyun-Joong Kim, Kyung Hee University, Yongin, South Korea

P3-129 Development of Multiplex PCR for the Detection of Typhoidal *Salmonella* Serovars — HYUN-JOONG KIM, Do-Geun Lee, Hae-Yeong Kim, Kyung Hee University, Yongin, South Korea

P3-130 Optimization of the Filtering Concentration Method for Rapid Detection of *Escherichia coli* O157:H7 in Lettuce and Cabbage Using Real-time PCR — JIN-HEE KIM, Seung-hae Gwak, So-Young Lee, Jong-Kyung Lee, Se-Wook Oh, Kookmin University, Seoul, South Korea

P3-131 Rapid Detection of *Escherichia coli* O157:H7 in Lettuce and Cabbage by Reducing Homogenization Buffer and DNA Elution Volumes — JIN-HEE KIM, So-Young Lee, Seung-hae Gwak, Se-Wook Oh, Kookmin University, Seoul, South Korea

P3-132 Serotype Identification from Metagenomic Sequencing of Flour Inoculated with a Cocktail of *Salmonella enterica* — JULIE HAENDIGES, Elizabeth Reed, James Pettengill, Jie Zheng, Errol Strain, Jesse Miller, Maria Hoffmann, NSF International, Ann Arbor, MI, USA

P3-133 Comparison of the Molecular Detection Assay 2 *Salmonella* and Korean Standard Method (real-time PCR) for the Detection of *Salmonella* Typhimurium in Mousse and Tiramisu Cakes — SO-YOUNG LEE, Jin-Hee Kim, Seung-hae Gwak, Seung-Ho Choi, Hyun-Jo Bang, Byoung-Ik Sohn, Se-Wook Oh, Kookmin University, Seoul, South Korea

P3-134 Comparison of the 3M Molecular Detection Assay and Korean Standard Method for Detecting *Salmonella* Typhimurium and *Listeria monocytogenes* in Yuk-Hwe and Yuk-Sashimi — SEUNG-HAE GWAK, Jin-Hee Kim, So-Young Lee, Byoung-Ik Sohn, Hyun-Jo Bang, Seung-Ho Choi, Se-Wook Oh, Kookmin University, Seoul, South Korea

P3-135 Rapid Detection of Shiga Toxin-producing *Escherichia coli* Using Recombinase Polymerase Amplification — Matthew Thomas, Timothy Janzen, Noriko Goji, VICTORIA ARLING, Burton Blais, Dele Ogunremi, Amit Mathews, Kingsley Amoako, Canadian Food Inspection Agency, Calgary, AB, Canada

P3-136 Validation of a Thirty-Second Test for Beta-Lactams at United States Tolerance/Target Levels in Commingled Raw Milk — Robert Markovsky, Stanley E. Charm, David Douglas, Ryan Sullivan, Alan Tran, David Legg, Janine Schwartz, Lindsey McRobbie, ROBERT SALTER, Charm Sciences, Inc., Lawrence, MA, USA

P3-137 Limit of Detection of a ELISA Commercial Kit for the Detection of T-2 Toxin in Foods — ADELINO DOSSANTOS, Amie Minor, Brenda Keavey, Zachary Kuhl, Megan Young, WVDA, Charleston, WV, USA

P3-138 Validation of an ELISA Detection Method Extension for Abrin in Foods — ADELINO DOSSANTOS, Amie Minor, Brenda Keavey, Zachary Kuhl, Megan Young, WVDA, Charleston, WV, USA

P3-139 Detection of Ricin in Foods Utilizing a Handheld Detection Device — AMIE MINOR, Adelino DosSantos, Zachary Kuhl, Brenda Keavey, Christian Robinson, Justin Ferrell, West Virginia Department of Agriculture, Charleston, WV, USA

P3-140 Simultaneous Quantification of Aflatoxin, Vomitoxin, and Fumonisin in Corn Using the Envirologix Common Extraction Protocol for Flex Mycotoxin Immunoassays — Anna Rice, Brendan Gow, Cheryl Bailey, Russell Roberts, Terry Goddard, Breck Parker, JACK PETERS, EnviroLogix, Inc., Portland, ME, USA

P3-141 Detection of Acrylamide in Foods Using Filtration-assisted Optical Detection — ZHUANGSHENG LIN, Lili He, UMass Amherst, Amherst, MA, USA

P3-142 Determination of Endocrine Disruptors and Two Metals in Foods — Keng-Win Tsai, CHIA-YANG CHEN, Institute of Food Safety and Health, National Taiwan University, Taipei City, Taiwan

P3-143 Determination of Perfluoroalkyl Substances in Food Packaging in Taiwan — Peng Siao, CHIA-YANG CHEN, Institute of Environmental Health, National Taiwan University, Taipei City, Taiwan

P3-144 Use of Surface-enhanced Raman Spectroscopy in Determination of Nano-sized Particles in Food Grade TiO_2 — JANAM PANDYA, Lili He, University of Massachusetts, Amherst, MA, USA

P3-145 Particle Size Analysis for Detecting Crystalline Solids in Powder Infant Formula — Bradley Taylor, RUO FEN LIAO, Garth Lee, Brigham Young University, Provo, UT, USA

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Food Chemical Hazards and Food Allergens

P3-146 Effectiveness of Cleaning Strategies for Removing Milk Chocolate from Pilot-scale Chocolate Processing Equipment — Liyun Zhang, Binaifer Bedford, Girdhari Sharma, Allison Brown, Helene Hopfer, Gregory Ziegler, LAUREN JACKSON, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-147 Transfer of Shrimp Allergens to Oil and French Fries Using Shared Fryers — Anirudh Kaja, Binaifer Bedford, Anne Eischeid, Steven Bloodgood, Jane Cluster, Karen Swajian, LAUREN JACKSON, U.S. Food and Drug Administration, Bedford Park, IL, USA

P3-148 Sandwich ELISA Targeting Ara h 2 and Ara h 3 for Improved Detection and Quantitation of Peanut in Foods — GIRDHARI SHARMA, Ajay Chatim, Ann Nguyen, Sefat Khuda, Kristina Williams, U.S. Food and Drug Administration - CFSAN, Laurel, MD, USA

P3-149 Development and Validation of a Quantitative Monoclonal Antibody-based ELISA for the Detection of Sesame in Common Food Products — John Gray, Henry Grise, JASON ROBOTHAM, Ken Roux, BioFront Technologies, Tallahassee, FL, USA

P3-150 Development of a Monoclonal Antibody-based ELISA for the Specific Detection of Fish Tropomyosin — HENRY GRISE, John Gray, Ken Roux, Jason Robotham, BioFront Technologies, Tallahassee, FL, USA

Beverages and Acid/Acidified Foods

P3-151 An Extended Bigelow-type Meta-Regression Model Describing the Heat Resistance of *Byssochlamys* Spores — VASCO A. P. CADAVEZ, Verônica Ortiz Alvarenga, Leonardo do Prado Silva, Anderson de Souza Sant'ana, Ursula A. Gonzales-Barron, Polytechnic Institute of Bragança, Bragança, Portugal

P3-152 Making Sulfur-free White Wine through the Use of α-Pinene — CHIH-YAO HOU, Yu-Wei Chen, Yu-Heng Lai, Zheng-Ting Hou, National Kaohsiung University of Science and Technology (NKUST), Kaohsiung, Taiwan

P3-153 Factors That Impact Survival of *Salmonella* during Storage of Beans and Batch Production of Cold Brew Coffee — JIA YAN, William Ristenpart, Linda J. Harris, University of California, Davis, Food Science and Technology Dept., Davis, CA, USA

P3-154 Evaluation of a CO_2 Monitoring System for the Early Quality Testing for a Variety (Chocolate, Vanilla, Coffee) of High Protein Beverage Drinks — PATRICIA RULE, Jessica Battisto, Austin Pettit, Michelle Keener, Brian Mayer, Stan Bailey, bioMérieux Inc., Hazelwood, MO, USA

P3-155 Microbial Source Tracking of Fecal Contamination in Maipo and Maule Rivers in Central Chile — AIKO ADELL, Constanza Díaz, Carla Barria, Gabriela Gaona, Nicolas Villagra, Leonardo Vera, Woutrina Smith, Minji Kim, Universidad Andres Bello, Santiago, Chile

P3-156 Microbial Evaluation of 'Adoyo' Drink Sold in Ogun State, Nigeria — MOJISOLA ADEGUNWA, Yejide Da-Silva, Emmanuel Alamu, Adegoke Bakare, Federal University of Agriculture, Abeokuta, Nigeria

P3-157 Does the Indigenous Microbial Community of Kombucha Prevent Survival and Growth of Pathogens? — SHERIDAN BREWER, Maria Torres, Mark Harrison, Larry R. Beuchat, Ynes R. Ortega, University of Georgia Center for Food Safety, Griffin, GA, USA

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P3-159 Inactivation of Foodborne Pathogens in Opaque Fluid Using a Thin-film UV Reactor — BRAHMAIAH PENDYALA, Ankit Patras, Michael Sasges, Tennessee State University, Nashville, TN, USA

P3-160 Effects of High Pressure and High Temperature Short Time Processing on Microbiological Shelf Life, Physicochemical Properties, and Non-Enzymatic Browning in Atemoya Juice — BANG-YUAN CHEN, Yun-Ting Hsiao, Chung-Yi Wang, Fu Jen Catholic University, Taipei, Taiwan

Water

P3-161 Prevalence and Characteristics of Selected Foodborne Bacterial Pathogens in Post-Hurricane Florence Floodwaters — JEFFREY NIEDERMEYER, William (Bill) Miller, Angela Harris, Ryan Emanuel, Theo Jass, Sophia Kathariou, North Carolina State University, Raleigh, NC, USA

P3-162 The Relationship between *E. coli* Levels and Pathogen Detection in Surface Water Samples is Mediated by Environmental Conditions — DANIEL WELLER, Natalie Brassill, Channah Rock, Sherry Roof, Renata Ivanek, Martin Wiedmann, Cornell University, Ithaca, NY, USA

P3-163 Occurrence and Levels of *Salmonella* Species in Primary Irrigation Water Canals and Return Flows in Arizona and the Risk of Contamination of Lettuce Crops — KELLY BRIGHT, Monique Torres, Patricia Gundy, Huruy Zerzghi, Brianna Leija, Candace Garrett, Charles Gerba, University of Arizona, Tucson, AZ, USA

P3-164 Incidence of Fecal Indicator and Pathogenic Bacteria in Reclaimed and Return Flow Waters in Arizona, United States — Libin Zhu, Monique Torres, Walter Betancourt, Manan Sharma, Shirley A. Micallef, Charles Gerba, Amy Sapkota, Amir Sapkota, Salina Parveen, Fawzy Hashem, Eric May, Kali Kniel, Mihai Pop, SADHANA RAVISHANKAR, University of Arizona, Tucson, AZ, USA

P3-165 *Listeria monocytogenes* Levels and Population Diversity in Surface Waters in the United States Mid-Atlantic Region — DUMITRU MACARISIN, Jin Qing, Dana Harriger, Rachael Picard, Edward Wells, Yakov Pachepsky, Marc Allard, Eric Brown, Yi Chen, U.S. Food and Drug Administration, College Park, MD, USA

P3-166 Occurrence and Population Diversity of *Listeria monocytogenes* in Two Irrigation Ponds in Maryland — JIN QING, Alec Barlow, Matthew Stocker, Yakov Pachepsky, Marc Allard, Eric Brown, Yi Chen, Dumitru Macarisin, U.S. Food and Drug Administration, College Park, MD, USA

P3-167 Evaluation of Nontraditional Irrigation Water Sources for Shiga Toxin-producing and Atypical Enteropathogenic *Escherichia coli* in the United States Mid-Atlantic Region — JOSEPH HAYMAKER, Manan Sharma, Salina Parveen, Fawzy Hashem, Eric May, Eric Handy, Chanelle White, Cheryl East, Rhodel Bradshaw, Shirley A. Micallef, Mary Theresa Callahan, Sarah Allard, Brienna Anderson, Shani Craighead, Samantha Gartley, Adam Vanore, Kali Kniel, Sultana Solaima, University of Maryland Eastern Shore, Princess Anne, MD, USA

P3-168 Presence of *Salmonella* and *Listeria monocytogenes* in Reclaimed and Surface Irrigation Water Sources on Maryland's Eastern Shore: A Conserve Study — CHANELLE WHITE, Fawzy Hashem, Salina Parveen, Eric May, Joseph Haymaker, Eric Handy, Cheryl East, Sarah Allard, Shirley A. Micallef, Manan Sharma, Kali Kniel, Amy Sapkota, University of Maryland Eastern Shore, Princess Anne, MD, USA

P3-169 Evaluation of Survival and Infectivity of Environmental *Listeria monocytogenes* Isolates in Tidal Brackish Irrigation Water — SAMANTHA GARTLEY, Shani Craighead, Brienna Anderson-Coughlin, Manan Sharma, Eric Handy, Rolf Joerger, Dallas Hoover, Kali Kniel, University of Delaware, Newark, DE, USA

P3-170 Variability of Generic *E. coli* Along the Tualatin River during the 2018 Blueberry Growing Season — Alex Emch, Sarah Guffey, Nicole Berg, Lauren Gwin, Jovana Kovacevic, JOY WAITE-CUSIC, Oregon State University, Corvallis, OR, USA

P3-171 Biofilm Formation by *Pseudomonas aeruginosa* Isolated from Mineral Water Samples Marketed in the State of São Paulo, Brazil — Beatriz Silva, Marianna Miranda Furtado, Lúcio Bueno Vieira Junior, Aline Cirino Trevisan, ANDERSON DE SOUZA SANT'ANA, University of Campinas, Campinas, Brazil

P3-172 Characterization of *Pseudomonas aeruginosa* Isolates in Mineral Water of São Paulo, Brazil, Using Pulsed-Field Gel Electrophoresis — Beatriz Silva, Sarah Lee, Christian Silva, Carlos Oliveira, ANDERSON DE SOUZA SANT'ANA, University of Campinas, Campinas, Brazil

P3-173 Photodynamic Treatment as an Alternative for *Alicyclobacillus* spp. Inactivation — Leonardo Prado-Silva, Ana T. P. C. Gomes, Mariana Q. Mesquita, Maria G. P. M. S. Neves, Maria A. F. Faustino, Adelaide Almeida, Gilberto U. L. Braga, ANDERSON DE SOUZA SANT'ANA, University of Campinas, Campinas, Brazil

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P3-174 Behavior of Silver Nanoparticles under Various Wash Water Conditions for Leafy Green Processing — GAYATHRI GUNATHILAKA, Jianzhou He, Hui Li, Wei Zhang, Elliot Ryser, Michigan State University, East Lansing, MI, USA

Packaging

P3-175 Fabrication of a Metal Oxide Coated Pouch for Alternative Processing of Military Ration Components — SHANNON MCGRAW, Christopher Oldham, Gregory Parsons, Danielle Froio-Blumsack, U.S. Army CCDC-Soldier Center, Natick, MA, USA

P3-176 Antimicrobial Coatings for Improving Safety and Shelf Life of Cherry Tomatoes — TONY JIN, Joshua Gurtler, U.S. Department of Agriculture – ARS, Eastern Regional Research Center, Wyndmoor, PA, USA

Seafood

P3-177 Black Drum (*Pogonias cromis*) Shelf Life Comparing Four Packaging Methods — JOSHUA COBAR, Katheryn Parraga, Evelyn Watts, Louisiana State University, Baton Rouge, LA, USA

P3-178 Development of Predictive Models for *Vibrio vulnificus* and *Vibrio cholerae* Growth in Gizzard Shad Sashimi — YUJIN KIM, Sun-Young Park, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P3-179 Quantification of Risk for *Vibrio parahaemolyticus* Foodborne Illness by Sea Pineapple (*Halocynthia roretzi*) Consumption — JOOHYUN KANG, Woori Kim, Min Suk Rhee, Yohan Yoon, Sookmyung Women's University, Seoul, South Korea

P3-180 Prevalence, Antibiotic Resistance, and Virulence Gene Profiles of *Listeria monocytogenes* Isolated from Smoked Salmon in South Korea — Se-Hyung Kim, Ki Sun Yoon, Eun Woo Lee, Won Bo Shim, Dongryeoul Bae, Dong-Hyeon Kim, MeeKyung Kim, Hyo-Sun Kwak, Jinhyun Kim, Yongseok Jang, KUN-HO SEO, Konkuk University, Seoul, South Korea

P3-181 Microbiological Characteristics of Non-eviscerated Smoked Blue Whiting (*Micromesistius poutassou)* Fish during Storage — ABIODUN KUPOLUYI, Adewale Olusegun Obadina, Mobolaji Omemu, Federal University of Agriculture, Abeokuta, Abeokuta, Nigeria

P3-182 Histamine Production by *Photobacterium* spp. in Tuna and Mahi-Mahi Tissue at Various Storage Temperatures — MARLEE HAYES, Katie L. Baltzer, Jessica Nash, Ronald A. Benner, Jr., Kristin Bjornsdottir-Butler, U.S. Food and Drug Administration, Gulf Coast Seafood Laboratory, Dauphin Island, AL, USA

P3-183 Metagenomic Evaluation of Methods to Recover of *Vibrio* spp. from Oysters — PADMINI RAMACHANDRAN, Leena Malayil, Robin Cagle, Amy Sapkota, Andrea Ottesen, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA

P3-184 Rapid Screening for Finfish Species Substitution Using Chip-based Capillary Electrophoresis and a Web-based Application — SHANNARA LYNN, NOAA, Pascagoula, MS, USA

P3-185 The Effect of Tumbling Processes on the Shelf Life of Whole Octopus (*Amphioctopus kagoshimensis* and *A. marginatus*) Stored in Ice — YU-RU HUANG, Chi-Jen Lo, Yung-Hsiang Tsai, Yi-Chen Lee, National Penghu University of Science and Technology, Penghu, Taiwan

P3-186 Food-derived Bioactive Peptides on Antioxidative Capacity, Xanthine Oxidase and Tyrosinase Inhibitory Activity — Anthony Thaha, Chung-Saint Lin, TAI-YUAN CHEN, National Taiwan Ocean University, Keelung, Taiwan

P3-187 Rapid Concentration and Molecular Detection of *Vibrio harveyii* in Oyster Farm Seawater — MICHAEL HORNBACK, J.D. Birkenholz, Steve Graham, Andrew Page, InnovaPrep, Drexel, MO, USA

P3-188 Inactivation of *Listeria monocytogenes* in Frozen Cooked Shrimp by High Pressure Processing — FOTEINI PARLAPANI, Ioannis Boziaris, Christina DeWitt, School of Agricultural Sciences, University of Thessaly, Volos, Greece

P3-189 The Inactivation Effect of High Pressure Processing on Histamine-forming Bacteria — Chung-Saint Lin, Yi-Chen Lee, Hsien-Feng Kung, Tai-Yuan Chen, Chung-Yi Wang, Siang-Mei Zeng, YUNG-HSIANG TSAI, National Kaohsiung University of Science and Technology, Kaohsiung City, Taiwan

P3-190 Application of High Pressure Processing for Preservation of Marlin Meat during Storage — Yi-Chen Lee, Chung-Saint Lin, Yu-Ru Huang, Shao-Lan Chen, Hsien-Feng Kung, Siang-Mei Zeng, YUNG-HSIANG TSAI, National Kaohsiung University of Science and Technology, Kaohsiung City, Taiwan

P3-191 Antibacterial and Antibiofilm Mechanism of Eugenol against *Vibrio parahaemolyticus* Clinical and Environmental Isolates — MD. ASHRAFUDOULLA, Md. Furkanur Rahaman Mizan, Kye-Hwan Byun, Iqbal Hossain, Shamsun Nahar, Sazzard Hossen Toushik, Sang-Do Ha, Advanced Food Safety Research Group, Brain Korea 21 Plus, Chung-Ang University, Ansung, South Korea

P3-192 Application of Chlorine Dioxide and Electron Beam Radiation for Reduction of Murine Norovirus-1 in Low Salt Fermented Clam (Jogaejeotgal) — JI YEON JO, Hee Jeong Kim, Mi Rae Kim, Sa Reum Park, Soo Yeon Jung, Sang-Do Ha, Advanced Food Safety Research Group, Brain Korea 21 Plus, Chung-Ang University, Ansung, South Korea

P3-193 Nisin Inhibition of *Listeria monocytogenes* in a Smoked Whitefish Salad Blend — BRIANNA BRITTON, Haley Oliver, Purdue University, West Lafayette, IN, USA

Meat, Poultry and Eggs

P3-194 Cold Chain Applied to Meat Products in Major Mexican Retail Stores — PEDRO ARRIAGA, Ema Maldonado, José Zaragoza, Citlalli Ariceaga, Universidad Autónoma Chapingo, Texcoco de Mora, Mexico

P3-195 Strategies for Reducing Foodborne Illness from Consumption of Ethnic Raw Meat Dishes in the United States — SHERYL CATES, Chris Bernstein, Jenna Brophy, Ellen Shumaker, Benjamin Chapman, RTI International, Research Triangle Park, NC, USA

P3-196 Effect of Cranberry Pomace on the Inactivation of *Salmonella enterica* Serovars and Physicochemical Changes during Dry Fermented Sausage Manufacturing — TSUN YIN ALEX LAU, Laura Arvaj, Philip Strange, Madison Goodwin, Shai Barbut, S. Balamurugan, University of Guelph, Guelph, ON, Canada

P3-197 Comparison of *Listeria* Isolates from Environmental Sampling Using Whole Genome Sequencing, Pulsed Field Gel Electrophoresis, and the Riboprinter® System — LAUREN DIMENNA, Jessica Hofstetter, Joseph Meyer, Angela Nguyen, Kraft Heinz Company, Toronto, ON, Canada

P3-198 Antimicrobial Effect of Microwave Treatment on Beef Jerky Inoculated with *Salmonella* and *Listeria monocytogenes* — DARVIN CUELLAR, Remio Moreira, Ayodeji Adeniyi, Don Stull, Alejandro Echeverry, Texas Tech University, Lubbock, TX, USA

P3-199 Performance Evaluation of Fluorescence Resonance Energy Transfer-based Real Time PCR for *Salmonella* spp. Detection in Nut Matrices (Almonds and Peanuts) at a 375-g Sample Size — Mirijam Garske, Farah Kristy, Patricia Rule, Peter Ladell, John Mills, Stan Bailey, VIKRANT DUTTA, bioMérieux Inc., Hazelwood, MO, USA

P3-200 Performance of a Fluorescence Resonance Energy Transfer-based Real-time PCR Assay for the Detection of *Salmonella* spp. Using a Manual Sampling Device for Beef — Steven Huang, Eric Wilhelmsen, John Mills, Stan Bailey, VIKRANT DUTTA, bioMérieux Inc., Hazelwood, MO, USA

P3-201 Performance Evaluation of a Fluorescence Resonance Energy Transfer Based Real-time PCR in a Unit Dose Format for the Detection of *E. coli* O157:H7 in 375g Ground Beef — Deborah Briese, Peter Ladell, John Mills, Stan Bailey, VIKRANT DUTTA, bioMérieux Inc., Hazelwood, MO, USA

P3-202 Estimating the Likelihood of Human Toxoplasmosis from Consuming *Toxoplasma gondii*-contaminated Fresh Cut Meats — SURABHI RANI, Jitender P. Dubey, Abani Pradhan, University of Maryland, College Park, MD, USA

P3-203 Shiga Toxin-producing *Escherichia coli* Harboring *stx1* or *stx2* Genes Isolated from Poultry Meat in Brazil — ANDRESSA MEM, Katia Leani Oliveira de Souza Silva, Mariza Landgraf, University of São Paulo, São Paulo, Brazil

P3-204 Evaluation of *Listeria monocytogenes* and *Staphylococcus aureus* Survival and Growth on Natural-source Nitrite-cured Ham during Stabilization — JIAN WU, Monica Ponder, Virginia Tech, Blacksburg, VA, USA

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P3-205 Comparison Effect of NaCl and KCl on *Clostridium sporogenes* PA3679 as Surrogate for *C. botulinum* in Shelf-stable Mortadella — Suzana Eri Yotsuyanagi, Ana Lucia da Silva Corrêa Lemos, MARISTELA DA SILVA NASCIMENTO, University of Campinas, Campinas, Brazil

P3-206 Effect of Different Dry Aging Temperatures on *Listeria innocua* as Surrogate for *Listeria monocytogenes* — Astrid Caroline Muniz Silva, Pâmela de Oliveira Pena, Sérgio Bertelli Pflanzer, MARISTELA DA SILVA NASCIMENTO, University of Campinas (UNICAMP), Department of Food Technology, Faculty of Food Engineering (FEA), Campinas, Brazil

P3-207 Fat Contributes to the Effect of Heat against *Salmonella* in Red Meat Juice — AMREETA SARJIT, Joshua T. Ravensdale, Ranil Coorey, Narelle Fegan, Gary A. Dykes, School of Public Health, Curtin University, Bentley, Western Australia, Australia

P3-208 Using Model Miniature Ham and Response Surface Metodology as a High-throughput Tool to Screen Antimicrobials Targeting *L. monocytogenes* — Shannon Rezac, Michael Miller, MATTHEW J. STASIEWICZ, University of Illinois at Urbana-Champaign, Urbana, IL, USA

P3-209 Effectiveness of Organic Acid Interventions for Reduction of *Escherichia coli* on Pork Carcasses in a Small-scale Pork Harvest Facility — KEELYN HANLON, Andrea English, Alejandro Echeverry, Mark Miller, Mindy Brashears, Texas Tech University, Lubbock, TX, USA

P3-210 Effectiveness of Organic Acid Interventions for Reduction of *Escherichia coli* on Pork Carcasses in a Large-scale Pork Harvest Facility with Blast Chilling — ANDREA ENGLISH, Keelyn Hanlon, Alejandro Echeverry, Mark Miller, Mindy Brashears, Texas Tech University, Lubbock, TX, USA

P3-211 Impact of Storage Temperature on the Survival of *Salmonella* in Finished Salami — BRANDON SELOVER, Joy Waite-Cusic, Oregon State University, Corvallis, OR, USA

P3-212 Microbiological Safety of *Staphylococcus aureus* and *Escherichia coli* in Dry-aged Beef Requiring Long Aging Time — Hyemin Oh, Yoonjeong Yoo, Yohan Yoon, HEEYOUNG LEE, Korean Food Research Institute, Wanju, South Korea

P3-213 Comparative Evaluation of Sanitizers for the Control of *E. coli* O157:H7 in Ground Beef — GOVINDARAJ DEV KUMAR, Joyjit Saha, Divya Jaroni, University of Georgia Center for Food Safety, Griffin, GA, USA

P3-214 Comparison of Culture Preparation and Inoculum Levels of *Listeria monocytogenes* in Challenge Studies Applied to Cooked Ready-to-Eat Meat Products — UPASANA HARIRAM, Wendy McMahon, Sandra Kelly-Harris, Mariana Ramirez, Mérieux NutriSciences, Crete, IL, USA

P3-215 Comparison of Clean Label Antimicrobials with Nitrite on the Inhibition of *Clostridium perfringens* during Extended Cooling of a Model Deli-Style Ham Product — MAX GOLDEN, Brandon Wanless, Kathleen Glass, University of Wisconsin-Madison, Madison, WI, USA

P3-216 Humidity Affects *Salmonella* Lethality and USDA FSIS Appendix A Compliance for Impingement-cooked Meat and Poultry Products — IAN HILDEBRANDT, Nicole Hall, Michael James, Elliot Ryser, Bradley Marks, Michigan State University, East Lansing, MI, USA

P3-217 The Effect of Recurring Cooling and Reheating on *Clostridium perfringens* Growth in Uncured Turkey and Cured Beef — HAYRIYE CETIN-KARACA, Gene Bartholomew, Smithfield Foods, Cincinnati, OH, USA

P3-218 The Effect of Pulsed Light Energy Delivery Mode on Inactivating *Salmonella* spp. in Vitro — DANIELA MENGARDA BUOSI, Yifan Cheng, Bruno A. M. Carciofi, Carmen Moraru, Cornell University, Ithaka, NY, USA

P3-219 Independent Performance Evaluation of VIDAS-Spt for the Detection of *Salmonella* spp. in Poultry Primary Production Samples — Vikrant Dutta, STAN BAILEY, bioMérieux Inc., Hazelwood, MO, USA

P3-220 Detection of Multiple Serotypes of Salmonella on Pre-chilled Chicken Carcasses by Whole Carcass Rinse or Whole Carcass Incubation — MARK BERRANG, Nelson Cox, Nikki Shariat, Kimberly Cook, Jonathan Frye, Richard Meinersmann, U.S. Department of Agriculture-ARS-USNPRC, Athens, GA, USA

P3-221 Survival of *Salmonella* Typhimurium and *Salmonella* Enteritidis after Treatment with Stress Conditions: Heating, Chilling, Salt and Freezing Temperatures — Pichet Koompa, Sornchalerm Suksri, PHUNNATHORN PHUCHIVATANAPONG, Jiraroj Neamnak, bioMérieux, Bangkok, Thailand

P3-222 The Effects of Feeding Original XPC on Reducing *Salmonella* Prevalence and Numbers in Ceca Samples and Carcass Rinses Taken from Commercial Broilers — JAMES MCGINNIS, J. Allen Byrd, Hilary Pavlidis, William Chaney, Diamond V, Cedar Rapids, IA, USA

P3-223 Control of *Salmonella* in Chicken Meat Using the Combination of a Commercial Bacteriophage and Plant-based Essential Oil Antimicrobial Compounds — Sun Hee Moon, EN HUANG, University of Arkansas for Medical Sciences, Little Rock, AR, USA

P3-224 Food Safety and Inspection Service Nationwide Raw Pork Products Sampling Study — MARIA SCOTT, Stephanie Buchanan, Naser Abdelmajid, Jennifer Webb, Jennifer Green, Paul Dolan, USDA–FSIS–OPHS, Washington, D.C., USA

P3-225 *Salmonella* and *Campylobacter* in Religious-exempt and Low-volume Poultry Products — ERIKA STAPP-KAMOTANI, Neal Golden, Wayne Schlosser, Nathan Bauer, Susan Schmidt, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

P3-226 Viability of *Listeria monocytogene*s and Shiga Toxin-producing *Escherichia coli* Cells on Slices of Commercially-produced Bresaola, a Dry-Cured Beef Product, during Extended Storage at 4° and 10°C — Ashley McCoy, Laura Shane, Elizabeth Henry, Manuela Osoria, YangJin Jung, Bradley Shoyer, Dennis Burson, John Luchansky, ANNA PORTO-FETT, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA

P3-227 Recovery of *Enterobacteriaceae* Indicator Organisms in Raw Poultry Rinse Testing Using Buffered Peptone Water and Neutralizing Buffered Peptone Water — LINDSEY ROSS, April Skinner, Robert Salter, Meikel Brewster, Charm Sciences, Inc., Lawrence, MA, USA

P3-228 Fate of Spore-forming Pathogens in High and Reduced-moisture, Shelf-stable Processed Meat and Poultry Products Subjected to Post-packaging Pasteurization — SARA MUNOZ, Andrea English, Ilan Arvelo, Mindy Brashears, Mark Miller, Marcos X. Sanchez-Plata, Texas Tech University, Lubbock, TX, USA

P3-229 Detection of Chicken Vaccine Strain *Salmonella* Enteritidis 441/014 (ade-/his-) and Differentiation between *Salmonella* Field Strains and the Vaccine Strain — OLAF DEGEN, Anne Roelfing, Cordt Groenewald, Kornelia Berghof-Jaeger, Biotecon Diagnostics, Potsdam, Germany

P3-230 Thermal Inactivation of *Salmonella, Campylobacter jejuni* and *Listeria monocytogenes* in Moisture Enhanced Non-intact Chicken Patties by Double Pan-broiling Under Dynamic Conditions — WENTAO JIANG, Lacey Lemonakis, Ka Wang Li, Cangliang Shen, West Virginia University, Morgantown, WV, USA

P3-231 Systematic Review and Meta-Analysis on the Effects of Processing Stages and Interventions to Control *Campylobacter* Contamination in Broiler Chickens — ONAY BURAK DOGAN, Anand Aditya, Juan Ortuzar, Jennifer Clarke, Fabio Mattos, Bing Wang, University of Nebraska-Lincoln, Lincoln, NE, USA

P3-232 Effect of Ozonated Water on the Microbiological Profile of Chicken Parts — CARMEN CANO, Yulie Meneses, Xinjuan Hu, Carly-Rain Adams, Byron Chaves, University of Nebraska-Lincoln, Lincoln, NE, USA

P3-233 Inactivation of *Listeria monocytogenes* in Model Chilling Brines for Hard Cooked Eggs — SUBASH SHRESTHA, Shelly Riemann, Bryan Talus, Cargill, Inc., Wichita, KS, USA

P3-234 Optimizing Ozone Use in a Heat-Ozone Combined Treatment Designed to Inactivate *Salmonella* Enteritidis Grown in the Yolk of Shell Eggs — YUMIN XU, David Kasler, Ahmed Yousef, The Ohio State University, Columbus, OH, USA

P3-235 Effect of Percent NaCl and Incubation Temperature on the Growth of *Salmonella* and Background Flora in Raw Chicken Samples from Thailand — CHANON KHAMTA, Sornchalerm Suksri, Pichet Koompa, Panida Pisaisawat, Nongnuch Promla, Wanida Mukkana, Saengrawee Jongvanich, Wipa Kongsakul, Yodlak Saengprao, Laboratory Accreditation Subdivision, Bureau of Quality Control of Livestock Products, Department of Livestock Development., Bangkok, Thailand

WEDNESDAY

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Microbial Food Spoilage

P3-236 Inactivation of Several Fruit Spoilage Molds Using Visible Light Emitting Diodes — VINAYAK GHATE, Isabelle Yew, Hyun-Gyun Yuk, Weibiao Zhou, National University of Singapore, Singapore, Singapore

P3-237 Efficacy of Different Disinfectants against Isolated and Biofilm Associated Yeasts from a Fruit Juice Production Facility — Roshan Aara Abdul, OLGA DE SMIDT, Hanita Swanepoel, Center for Applied Food Security and -Biotechnology (CAFSaB), Central University of Technology, Free State, Bloemfontein, South Africa

P3-238 Bioaerosols in a Fruit Juice Manufacturing Facility – Harmful, Harmless or Perhaps Helpful? — Shirleen Theisinger, OLGA DE SMIDT, Ryk Lues, Center for Applied Food Security and Biotechnology (CAFSaB), Central University of Technology, Free State, Bloemfontein, South Africa

P3-239 Inactivation of *Alicyclobacillus acidoterrestris* Spores in Different Types of Juices by 222-Nanometer Krypton-Chlorine Excilamp Irradiation and Identification Sporicidal Mechanism — HAK-NYEONG HONG, Jun-Won Kang, Dong-Hyun Kang, Seoul National University, Seoul, South Korea

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P3-241 Food Safety Knowledge, Attitudes and Practices of Street Food Vendors in Thailand — Chanchana Siripanwattana, Kamonwan Chucheep, Panida Pisaisawat, Nongnuch Promla, Wanida Mukkana, Saengrawee Jongvanich, Wipa Kongsakul, Yodlak Saengprao, SUWIMON KEERATIPIBUL, Chulalongkorn University, Bangkok, Thailand

P3-242 Validation of the Use of Acetic Acid Incorporated with Chitosan to Prolong Shelf Life of Grass-fed Ground Beef — TAYLOR LADNER, Shecoya White, Derris Burnett, Mississippi State University, Starkville, MS, USA

P3-243 Evaluation of the Microbiological Quality of Minced Pork Using Visible and Fluorescence Spectroscopy Methods in Tandem with Multivariate Analysis — Lemonia-Christina Fengou, Alexandra Lianou, Panagiotis Tsakanikas, Efstathios Panagou, GEORGE-JOHN NYCHAS, Laboratory of Microbiology and Biotechnology of Foods, Department of Food Science and Human Nutrition, Agricultural University of Athens, Athens, Greece

P3-244 Application of Fluorescence Spectroscopy as a Tool for Microbial Spoilage Assessment in Fresh-cut Pineapple — Evanthia Manthou, Alexandra Lianou, Panagiotis Tsakanikas, Evangelos Dagres, Efstathios Panagou, GEORGE-JOHN NYCHAS, Laboratory of Microbiology and Biotechnology of Foods, Department of Food Science and Human Nutrition, Agricultural University of Athens, Athens, Greece

P3-245 Comparison of Six Methods for Quantification of Lactic Acid Bacteria in Spoiled Sliced Turkey — CHENG ZHANG, Wendy McMahon, Sandra Kelly-Harris, Mérieux NutriSciences, Crete, IL, USA

P3-246 Microbial Profiling of Subprimals Before and After Water Spray and Dry Chilling of Beef Carcasses Subjected to Hot Water Rinses during Long-term Storage — DIEGO CASAS, Savannah Forgey, Rosine Manishimwe, Mark Miller, Marcos X. Sanchez-Plata, Mindy Brashears, Texas Tech University, Lubbock, TX, USA

P3-247 Impact of Carcass Spray-Chilling, Dry Chilling and Hot Water Washes on the Shelf Life and Microbial Profiles of Beef Ribeye Rolls — SAVANNAH FORGEY, Diego Casas, Rosine Manishimwe, Mark Miller, Mindy Brashears, Marcos X. Sanchez-Plata, Texas Tech University, Lubbock, TX, USA

P3-248 Identification of Microbial Hazards in the Production Process of a Typical Cheese, Wara, in Alabata, Abeokuta, Nigeria — FEYISOLA AJAYI, Adewale Olusegun Obadina, Federal University Gashua, Nigeria, Gashau, Nigeria

P3-249 Predictive Microbiology Analysis of Dairy Products Stored in Home Refrigerators — J. ANTONIO TORRES, Veronica Rodriguez-Martinez, Daniela Gonzalez de la Garza, Gonzalo Velazquez, Fabian Fagotti, Reynaldo de la Cruz Quiroz, Jorge Welti-Chanes, Tecnologico de Monterrey, Monterrey, NL, Mexico

P3-250 Evaluation of the Consumption and Contamination Level of Vegetables and Fruits in Ethiopia — FIREHIWOT DERRA, Tesfaye Bedada, Redwan Edicho, Samson Gabre, Waktola Sime, Rahel Fekade, Tigist Yohannes, Almaz Biegna, EPHI, AA, Ethiopia

P3-251 Microbial Quality during Storage, Prevalence of Foodborne Pathogens and *Salmonella* Colonization Based on Variances in Netting Densities of Melons Grown in Different Regions of the United States — AISHWARYA RAO, Richard Park, Martin Porchas, Paul Brierley, Sadhana Ravishankar, University of Arizona, Tucson, AZ, USA

P3-252 Identification of Tomato Paste Spoilage Bacteria Using Vibrational Spectroscopy Technologies — YADWINDER SINGH RANA, Luis Rodriguez-saona, Abigail Snyder, The Ohio State University, Columbus, OH, USA

P3-253 A Machine Learning Approach to Analyze Micro-Isothermal Calorimetry as a Function of Microbial Growth in Fresh and Processed Foods — IMRAN AHMAD, Yujie Li, Michael Cheng, Florida International University, North Miami, FL, USA

P3-254 Extraction and Characterization of Extracellular Polymeric Substances (EPS) of *E. coli* O157:H7 ATCC 43888 and *Listeria monocytogenes* ATCC 7644 Molecular Biofilms Grown under Different Growth Conditions — STANLEY DULA, Oluwatosin Ademola Ijabadeniyi, Durban University of Technology, Durban, South Africa

P3-255 Antibacterial Properties of High Voltage Cold Atmospheric Plasma and Its Effect on Quality of Asian Sea Bass Slices — OLADIPUPO OLATUNDE, Soottawat Benjakul, Kitiya Vongkamjan, Department of Food Technology, Faculty of Agro-Industry, Prince of Songkla University, Hat Yai, Songkhla, Thailand

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Start Where You Are!

Make a difference! Unite with other food safety professionals by joining or forming an IAFP Affiliate in your area. IAFP currently has fifty-six Affiliates on six continents whose objectives are consistent with those of our Association. If you are an IAFP Member or an IAFP Annual Meeting attendee, your knowledge of and dedication to food safety will contribute toward the many opportunities your local Affiliate can offer.

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RECOGNITION FOR CORPORATE EXCELLENCE IN FOOD SAFETY AND QUALITY

The Black Pearl Award is presented annually to a company for its efforts in advancing food safety and quality through consumer program, employee relations, educational activities, adherence to standards and support of the goals and objectives of the International Association for Food Protection. We invite you to nominate your company for this prestigious recognition. Contact the Association office for nomination information.

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Fellow Award

Francisco Diez-Gonzalez
Griffin, Georgia

Dr. Francisco Diez-Gonzalez is a recipient of the 2019 IAFP Fellow Award. Dr. Diez-Gonzalez is the Director of the Center for Food Safety and a Professor in the Department of Food Science and Technology at the University of Georgia in Griffin.

In 1999, Dr. Diez-Gonzalez joined the University of Minnesota's Department of Food Science and Nutrition as Assistant Professor in Food Safety Microbiology. He was promoted to Associate and full Professor in 2005 and 2011, respectively, and served as Department Head from 2014–2016, teaching courses on food safety and food microbiology.

An IAFP Member since 1999, Dr. Diez-Gonzalez has served on numerous PDGs and Committees, including as a current member of the Program Committee and on the Editorial Boards for both the *Food Protection Trends* and the *Journal of Food Protection*. He also serves on the Editorial Boards for *Applied and Environmental Microbiology; Frontiers;* and *Microbiology Spectrum*.

Dr. Diez-Gonzalez has participated as a panel member of multiple USDA granting programs and was a member of the National Research Council's Committee on Risk Ranking. He currently serves on the USDA's National Advisory Council for Microbiological Criteria in Foods, and conducts research on ecology, control, and detection of foodborne bacteria in different food commodities.

Dr. Diez-Gonzalez graduated with a B.S. in Food Science from the Instituto Tecnológico y de Estudios Superiores de Monterrey in Queretaro, Mexico, and worked as an R&D Manager for Griffith Laboratories in Mexico. He earned his M.S. and Ph.D. in Food Science from Cornell University and continued at Cornell as a postdoctoral Research Associate in the Department of Microbiology. He has authored more than 90 peer-reviewed articles and 13 book chapters.

Linda J. Harris
Davis, California

Dr. Linda J. Harris is a recipient of the 2019 IAFP Fellow Award. Dr. Harris is a Specialist in Cooperative Extension in Microbial Food Safety, Chair of the Department of Food Science and Technology at the University of California – Davis, and a collaborator for the Western Center for Food Safety.

Throughout her nearly 40-year career as a food scientist, Dr. Harris has developed an impactful and internationally recognized research and education program. She was a pioneer in the study of the microbial food safety of fresh fruits and vegetables, fresh juices, and in the ecology of *Salmonella* and other foodborne pathogens in tree nuts, particularly almonds, walnuts, and pistachios, and their production and processing environments. Through her research and extension programs, she has had the opportunity to mentor many talented students and postdoctoral scholars.

Dr. Harris has been a member of IAFP since 1988 and has served as a leader on numerous PDGs; as Chair of the Dairy, Food and Environmental Sanitation Management Committee; as a member of several Award Selection Committees and the Program Committee; and through organizing and participating in many local, national, and international meetings. She has also served on both the Management Committee and the Editorial Board for the *Journal of Food Protection*.

Dr. Harris has been recognized for her research and education accomplishments as a recipient of the Elmer Marth Educator Award (2004), the Frozen Food Foundation Research Award (2010), and by nomination as Fellow of the Institute of Food Technologists (2018). In 2013, she was elected Secretary of IAFP and proudly served as President of the Association in 2016–2017.

Fellow Award

Steven C. Ricke
Fayetteville, Arkansas

Dr. Steven C. Ricke is a recipient of the 2019 IAFP Fellow Award. Dr. Ricke is a Professor in the Department of Food Science and Cellular and Molecular Graduate Program at the University of Arkansas (UA) in Fayetteville.

Dr. Ricke joined UA in 2005, where he became the university's first holder of the Donald "Buddy" Wray Endowed Chair in Food Safety and Director of the Center for Food Safety. He received his B.S. and M.S. from the University of Illinois and his Ph.D. with a joint major in Bacteriology and Animal Science from the University of Wisconsin. He was a USDA-ARS post-doctoral candidate in the Microbiology Department at North Carolina State University before joining Texas A&M University as a Professor in the Poultry Science Department.

Dr. Ricke's *Salmonella* research projects spanning more than 25 years have emphasized studies on the growth, survival, and pathogenesis during food animal production and processing. In recognition of his research, he received both the Poultry Science Association (PSA) Research Award and the American Egg Board Award; became a Texas Agricultural Experiment Station Faculty Fellow; received the UA Division of Agriculture – John White Outstanding Research Award; and most recently was named a PSA Fellow.

Dr. Ricke has been active in IAFP since 1993, with his group publishing 26 research and review articles in IAFP's scientific journals and presenting 28 research presentations at IAFP's Annual Meetings. He has presented three invited talks at IAFP meetings and served on the Editorial Board of the *Journal of Food Protection*. He is a co-founder and former President of the IAFP Affiliate, the Arkansas Association of Food Protection (AAFP), and was named an AAFP Fellow.

Tori Stivers
Peachtree City, Georgia

Tori Stivers is a recipient of the 2019 IAFP Fellow Award. Ms. Stivers is a Seafood Specialist with the University of Georgia's Marine Extension and Georgia Sea Grant. She focuses on seafood safety outreach and training and encourages consumption of Georgia seafood. Her most recognized work includes efforts to prevent deadly *Vibrio vulnificus* infections from raw shellfish consumption or marine-related wounds, especially through her *SafeOysters.org* website.

Ms. Stivers also teaches HACCP courses for the seafood industry and looks for niche markets for Georgia-harvested saltwater seafood to keep it from being shipped out-of-state or country. One challenge is to develop a U.S. market for cannonball jellyfish typically exported to Asian countries.

A 26-year IAFP member, Ms. Stivers is convinced of the importance of the Association's role to foster the exchange of food safety ideas between countries, government agencies, industry, and academia. Her service with IAFP includes as Chair of the Affiliate Council; serving on the Executive Board; serving on the Program and Nominating Committees; organizing and convening symposia; and as a member of the Seafood Safety and Quality PDG and the Food Safety Education PDG. Participating in IAFP's mission to protect the global food supply has been one of the most fulfilling parts of her career.

Ms. Stivers has been a member of the IAFP Affiliate, the Georgia Association for Food Protection, since 1993, and has served as President, as well as a ten-year term as Delegate. She is also a member of the Seafood HACCP Alliance Steering Committee and the Interstate Shellfish Sanitation Conference.

President's Lifetime Achievement Award

Gary R. Acuff
College Station, Texas

Dr. Gary R. Acuff is the recipient of the 2019 IAFP President's Lifetime Achievement Award. This award is given at the discretion of the Association's President to recognize an individual who has made a lasting impact on "Advancing Food Safety Worldwide" through a lifetime of professional achievement in food protection. Dr. Acuff is the managing member of Acuff Consulting, LLC, founded in 2018 to provide food microbiology expertise in commercial food production systems. Previously, Dr. Acuff was a Professor of Food Microbiology at Texas A&M University in College Station and served on the faculty for 39 years. He served as Director of the Texas A&M Center for Food Safety and as Head of the Department of Animal Science at the university.

Dr. Acuff's research has focused on improving the microbiological quality and safety of red meat and poultry in all areas of production and utilization, and most recent activities have centered on the effective use of surrogate bacteria for validation of process control in HACCP and Food Safety systems. Additional research interests have included characterizing the presence of *Campylobacter jejuni* in turkey processing and survival of pathogenic bacteria in low-moisture foods. Dr. Acuff has authored or co-authored more than 100 peer-reviewed research publications in scientific journals and numerous chapters in various references and textbooks.

An IAFP Member since 1982, Dr. Acuff was the Association's President from 2007–2008. Throughout his Membership, he has served on numerous committees, including the Foundation Committee, the Nominating Committee, several Award Selection Committees, and on both the IAFP Organizing Committee and the European Organizing Committee. He also served on both the *Journal of Food Protection's* Editorial Board and Management Committee and on the *Food Protection Trends* Management Committee, and is a member of several of IAFP's Professional Development Groups (PDGs). Dr. Acuff received the IAFP Fellow Award in 2013 and presented the IAFP 2018 Ivan Parkin Lecture. He is also a Fellow of the American Academy of Microbiology.

Dr. Acuff obtained his B.S. in Biology from Abilene Christian University and both his M.S. and Ph.D. in Food Science and Technology, specializing in food microbiology, from Texas A&M University.

Honorary Life Membership Award

J. Stan Bailey
Athens, Georgia

Dr. J. Stan Bailey is a recipient of the 2019 IAFP Honorary Life Membership Award. Dr. Bailey is the Senior Director of Scientific Affairs for bioMérieux Industry. Before joining bioMérieux, he was a Research Scientist for the USDA's Agricultural Research Service (ARS) for 35 years. In 2002, Dr. Bailey was named the USDA's ARS Outstanding Senior Research Scientist.

Dr. Bailey has authored or co-authored more than 500 scientific publications in the area of food microbiology, concentrating on controlling *Salmonella* in poultry production and processing; *Salmonella* methodology; *Listeria* methodology; and rapid methods of identification.

An active member of IAFP for nearly 33 years, Dr. Bailey served as President in 2009. Throughout his Membership, he has organized and moderated many symposia and served on numerous committees, including the Program Committee, the European Organizing Committee and the *Journal of Food Protection* (*JFP*) Management Committee. He also served on the *JFP* Editorial Board. Dr. Bailey received the IAFP Fellow Award in 2005 and the Maurice Weber Laboratorian Award in 2003. He is also a Fellow of the American Academy of Microbiology, received the 1997 Federal Laboratory Consortium Technology Transfer Award, and holds seven U.S. patents. Internationally, Dr. Bailey served as an expert consultant to both the Foreign Agriculture Organization and the U.S. State Department and has presented invited talks in numerous countries around the world.

Dr. Bailey received his B.S. in Environmental Health Sciences, M.S. in Food Science, and Ph.D. in Poultry Science, all from the University of Georgia.

Pina Fratamico
Wyndmoor, Pennsylvania

Dr. Pina Fratamico is a recipient of the 2019 IAFP Honorary Life Membership Award. Dr. Fratamico retired from the USDA, Agricultural Research Service (ARS), Eastern Regional Research Center (ERRC) in 2018, where she served as Research Leader of the Molecular Characterization of Foodborne Pathogens Research Unit. She now serves as a Collaborator (Emeritus) scientist with ARS.

Dr. Fratamico received a Ph.D. in Microbiology and Immunology in 1990 and conducted post-doctoral work at the ARS ERRC, where she was then hired as a permanent scientist. Her research focuses on methods for detection and typing of foodborne pathogens; and genomic, proteomic, and other technologies to investigate pathogen survival, virulence, biofilm formation, cell-to-cell communication systems, and mechanisms for adaptation to environmental stress. Dr. Fratamico works with and serves as an advisor with academic institutions, regulatory agencies, and the food industry, as well as the World Health Organization, the Food and Agriculture Organization, and others. She has authored more than 200 publications, including 38 book chapters, has edited nine books, and holds two patents.

An IAFP Member since 1995, Dr. Fratamico has been a member of the *Journal of Food Protection* Editorial Board since 1995, and served on the *Journal of Food Protection* Management Committee (2005–2008). In 2006, Dr. Fratamico and her team received the GMA Food Safety Award.

Other awards received for her research accomplishments include the Presidential Early Career Award for Scientists and Engineers; the IFT Food Microbiology Division Outstanding Service Award; and the ARS Technology Transfer Award. Dr. Fratamico is a Fellow of both the Institute of Food Technologists and the American Academy of Microbiology. She has served as Chair of both the ASM's Division P (Food Microbiology) and the IFT Biotechnology Division.

Honorary Life Membership Award

Keith A. Ito
Davis, California

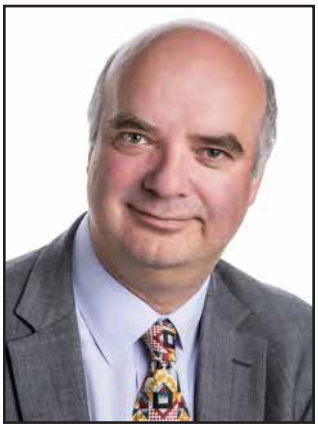
Keith A. Ito is a recipient of the 2019 IAFP Honorary Life Membership Award. Mr. Ito is a Specialist, Emeritus at the Laboratory for Research in Food Preservation, administered by the Food Science and Technology Department, at the University of California – Davis. He retired in 2012 as Director from the laboratory, part of the State of California's botulinum control program, and is currently a consultant in the food industry.

Mr. Ito joined the university after his retirement in 2003 from the National Food Processors Association, a non-profit food trade association, where he served as Senior Vice President of the Technical Assistance Center.

Mr. Ito's research interests are in the thermal and germicidal resistance of *Clostridium botulinum*, food safety of fresh produce, and the thermal resistance of vegetative pathogens in low-moisture foods. He has served as an advisor to numerous groups including as a technical advisor to the National Conference on Interstate Milk Shipment; Aseptic Program Committee (2004–2018); as a member of the Washington State University Microwave Processing Consortium (2002–2004); as consultant to the California Strawberry Commission (2007–2014); and as a member of the Almond Board of California's Technical Expert Review Panel (2012–2018). He is the co-editor of the *Compendium of Methods for the Microbiological Examination of Foods* (4th edition) and served on the Editorial Board for the *Compendium* (5th edition).

An IAFP Member since 1997, Mr. Ito is a member of several Professional Development Groups (PDGs), including the Microbial Modeling and Risk Analysis PDG; the Beverage and Acid/Acidified Foods PDG; the Low Water Activity PDG; the Pre-Harvest Food Safety PDG; and the Fruit and Vegetable Safety and Quality PDG.

Mr. Ito holds a B.A. in Bacteriology from the University of California, Berkeley.



John Holah
Bury, United Kingdom

Dr. John Holah is a recipient of the 2019 IAFP Honorary Life Membership Award. Since 2014, Dr. Holah has served as the Technical Director at Holchem Laboratories, the UK's largest supplier of food hygiene services to the food industry, located in Bury. His current responsibilities include the development of innovative cleaning and disinfection technologies and their successful utilization to practically implement Good Hygiene Practices (GHPs).

Prior to his current position, Dr. Holah served for 25 years as Head of the Food Hygiene Department at Campden BRI, where he worked on the prevention of microbial contamination of food during its manufacture, distribution and retail. Working with more than 500 food factories and catering establishments throughout the world, Dr. Holah and his group were responsible for establishing many GHPs used in the food industry for the control of pathogens, particularly *Listeria*, *Salmonella* and *E. coli*, and allergens.

Dr. Holah is also an Honorary Professor of Food Safety and Hygienic Design at Cardiff Metropolitan University in Cardiff, and is involved in research projects on food safety culture, specifically applied to sanitation and hygienic design, that may help to ensure the successful application of such GHPs.

Throughout his career, Dr. Holah has led several European and UK research projects; written more than 150 publications; given more than 250 external presentations; edited a trilogy of books on Food Hygiene; has a wide range of teaching experience from industry to university M.Sc. courses; and has been external supervisor to more than 20 Ph.D. students.

Dr. Holah joined IAFP in 1990 and has served on the *Food Protection Trends* Editorial Board and presented at several of the Association's Annual and European Meetings. He received the IAFP International Leadership Award in 2014.

Dr. Holah has represented the UK on CEN/TC 216/Chemical disinfectants and antiseptics; chaired ISO/TC 199/WG2 on the Hygienic Design of Machinery; and was a member of the UK National Health Service Rapid Review Panel. Since its formation in 1989, he has been an active member of the EHEDG.

Dr. Holah has also chaired the GFSI Technical Working Group on the Hygienic Design of Food Processing Facilities and Equipment since October 2018.

Honorary Life Membership Award

Jenny Scott
Laurel, Maryland

Jenny Scott is a recipient of the 2019 IAFP Honorary Life Membership Award. Ms. Scott is a Senior Advisor to the Director of the Office of Food Safety at the U.S. Food and Drug Administration's (FDA's) Center for Food Safety and Applied Nutrition (CFSAN). She began her career as a Research Specialist at the Food Research Institute at the University of Wisconsin before joining the National Food Processors Association, holding various positions, such as research microbiologist; head of microbiology; director of processing technology and microbiology; and (following the merger with the Grocery Manufacturers Association) Vice President of Food Safety Programs. She joined the FDA in 2009 and serves as the technical lead on the Preventive Controls for Human Food regulation and guidance.

Ms. Scott has been an active member of IAFP since 1982. She has participated in several PDGs and served on the Program Committee, the Constitution and Bylaws Committee, the Foundation Fund Committee, the Nominating Committee, and several awards committees. In 1997, she was elected to the IAFP Executive Board, becoming IAFP President in 2000–2001. Ms. Scott also serves as Delegate for the IAFP Affiliate, the Capital Area Food Protection Association. She received the Harold Barnum Industry Award (2007); the Harry Haverland Citation Award (2014); the President's Lifetime Achievement Award (2018); the GMA Food Safety Award (2018); and was elected an IAFP Fellow (2005). She was the Ivan Parkin Lecturer at IAFP 2012.

In addition, Ms. Scott served on the National Advisory Committee on Microbiological Criteria for Foods (2002–2009 and 2018–present) and on the U.S. Delegation to the Codex Alimentarius Committee on Food Hygiene (1991–present), where she has led the delegation since 2010.

Ms. Scott obtained her B.A. in Biology and Psychology from Wellesley College, an M.S. in Bacteriology from the University of Wisconsin, and an M.S. in Food Science from the University of Maryland.

Harry Haverland Citation Award

Randy Worobo
Geneva, New York

Dr. Randy Worobo is this year's recipient of the Harry Haverland Citation Award. This award honors Dr. Worobo for his many years of dedication and devotion to the Association's ideals and objectives. He is a Professor of Food Microbiology in the Department of Food Science at Cornell University's College of Agriculture and Life Sciences, teaching undergraduate and graduate food safety assurance classes that provide CGMP, HACCP, and SQF certification for his students, a unique offering that positions Cornell Food Science students with key food safety certifications at the onset of their careers.

Dr. Worobo has developed an internationally recognized research program on alternative approaches to enhance microbial safety and reduce microbial spoilage of foods by designing and validating new, non-thermal processing techniques for juice and beverages, which has been adopted by industry. His research on improving our understanding of pathogen transmission and survival on fruits and vegetables has made a significant impact on the safety of fresh and minimally processed produce. In collaboration with Mr. Phil Hartman, an electrical engineer, Dr. Worobo developed a commercial ultraviolet light processing unit that was validated to meet the 5-log performance standards prescribed in the Juice HACCP regulation and is now in use in more than 900 commercial applications.

Dr. Worobo currently serves as the Director of the Cornell University HPP Validation Center, which provides validation studies for the food industry who employ HPP processing technology for their food products. Through his extension program, he engages with the industry through workshops, conferences, and direct contact with various sectors of the food industry around the world. He was one of the founding members of the Juice HACCP Curriculum Committee and has trained thousands of juice industry professionals, as well as state and federal inspectors, on juice HACCP principles for 20 years.

An IAFP since 1997, Dr. Worobo has served on the *Journal of Food Protection* Editorial Board, participated in several symposia, and presented more than 40 posters at IAFP Annual Meetings. He has also served as a judge for the IAFP Developing Scientist Competition and poster competitions. He is a member of the Fruit and Vegetable Safety and Quality PDG and the Beverage and Acid/Acidified Foods PDG, and is active in IAFP's Affiliate, the New York State Association for Food Protection, giving numerous presentations over the years. Dr. Worobo holds a Ph.D. from the University of Alberta.

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Food Safety Innovation Award

Clēan Works Corporation
Beamsville, Ontario, Canada

Clēan Works Corporation is the recipient of the 2019 Food Safety Innovation Award for its development of patent pending processes for sanitizing the surface of produce and other foods without using water. The concept of the technologies was to devise methods that could reduce pathogens and spoilage microflora more effectively than post-harvest washing. The technologies manufactured and distributed by Clēan Works stemmed from the need to have effective, preventative controls for candied apple production in the wake of a 2014 *Listeria* outbreak centered in California.

Clēan Works was established in 2017 through a collaboration between Moyers Apple Products Ltd. and Court Holdings to commercialize the four years of research and development. It includes support from Dr. Keith Warriner of the University of Guelph; Paul Moyer of Moyers Apple Products Ltd.; and Mark VanderVeen of Court Holdings. The technologies include an Advanced Oxidative Process (Clēan Flow) and Forced Air Ozone Reactor (Clēan Batch). The Clēan Works team developed units that can be applied in the laboratory, pilot or commercial scale. Clēan Works has installed custom built units in several fruit processing facilities within North America, with additional installations at the construction stage. Future plans include expanding into Europe, Asia, India, and Australia.

Clēan Works continues its research to demonstrate the far-reaching potential of these technologies to treat a diverse range of foods, including low-moisture ingredients, in addition to food contact surfaces such as utensils and containers.

Sponsored by Walmart

International Leadership Award

Marcel Zwietering
Wageningen, The Netherlands

The 2019 International Leadership Award goes to Dr. Marcel Zwietering for his dedication to the high ideals and objectives of IAFP and his promotion of the mission of the Association in countries outside the U.S. and Canada. Dr. Zwietering is a Professor of Food Microbiology at Wageningen University in Wageningen, The Netherlands, focusing on research subjects in the domain of food safety management, risk analysis, fermentation, detection and hygiene, eco-physiology, and functional genomics. He has supervised more than 30 Ph.D. students and currently supervises 10 Ph.D. candidates.

Dr. Zwietering graduated cum laude in Biotechnology at Wageningen University with his Ph.D. research project, "Modeling of the Microbial Quality of Food." He continued in the Food Process Engineering group, first as a tenured Assistant Professor, then as an Associate Professor. His research focused on quantitative microbiology and risk assessment. In 1995, during his sabbatical, Dr. Zwietering joined the Unilever Research Lab in the United Kingdom. In 1998, he moved to the research lab of Danone in France, where he worked on starter cultures, symbiosis, metabolic flux analysis, and quantitative risk assessment. He returned to Wageningen University in 2003.

Dr. Zweitering has published more than 200 papers and has an h-factor of 42. He is Editor of the *International Journal of Food Microbiology* and serves on the Editorial Board of the *Journal of Food Protection*. Dr. Zwietering is Co-Chair of the ILSI – Europe Microbiological Food Safety Task Force and is regularly invited for international expert consultations for FAO/WHO, EFSA, and Codex working groups. He is a member of the International Commission on Microbiological Specifications for Foods, the Dutch Health Council, and the Academic Board of Wageningen University.

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GMA Food Safety Award

Almond Board of California
Modesto, California

The recipient of the 2019 GMA Food Safety Award is the Almond Board of California (ABC), located in Modesto. Formed in 1950, ABC has overseen the responsible growth of the industry, from 91,500 bearing acres producing 41.6 million pounds of almonds annually to 1,070,00 bearing acres today, producing 2.29 billion pounds of almonds, with a farm value exceeding $5.5 billion.

The Board directs a full-time professional staff engaged in key program areas, including food safety research, food safety programs, industry outreach, and education. The Board and the ABC staff represent 6,500 growers and 100 almond handlers throughout the state of California. ABC supports the almond industry through its research-based approach toward all aspects of production, processing, and marketing on behalf of the California Almond growers and handlers. A key focus and core value of ABC is the commitment to ensuring food safety.

Since 2000, ABC has invested more than $10 million in research and pathogen/analytical surveys, resulting in the publication of more than 30 almond food safety and quality peer-reviewed scientific journal articles and numerous technical bulletins, serving as the basis for several ABC programs, including the mandatory treatment program for *Salmonella* reduction. The mandatory rule, enacted by the industry and codified under 7 CFR Part 981.442, went into effect September 1, 2007.

Today, ABC continues to make investments in food safety with the goal of protecting consumers as well as ensuring the integrity of California Almonds and the low-moisture food category in general.

Sponsored by GMA

Frozen Food Foundation Freezing Research Award

Martin Wiedmann
Ithaca, New York

Dr. Martin Wiedmann is the recipient of the 2019 Frozen Food Foundation Freezing Research Award. This award honors an individual, group or organization for pre-eminence and outstanding contributions to research that impacts food safety attributes of freezing.

Dr. Wiedmann is the Gellert Family Professor of Food Safety at Cornell University in Ithaca, New York, where he has been a faculty member since 1999. His research focuses on farm-to-table microbial food quality and safety and the application of modern molecular and modeling tools to study the transmission of foodborne pathogens and spoilage organisms. His program also includes a strong emphasis on translation of research findings to reduce foodborne illnesses and microbial food spoilage. Dr. Wiedmann's team and collaborators have published more than 350 peer-reviewed publications, which have been cited more than 10,000 times. His research includes broad collaborations with industry, universities, and government agencies.

Dr. Wiedmann joined IAFP in 2000 and currently serves on the Editorial Board for the *Journal of Food Protection*.

Noted awards received by Dr. Wiedmann include the Foundation Scholar Award from the American Dairy Science Association (2002); the Samuel Cate Prescott Award from the Institute of Food Technologists (2003); the International Life Science Institute North America Future Leader Award (2004); and the American Meat Institute Foundation Scientific Achievement Award (2011). He has been named a Fellow of the American Association for the Advancement of Science (AAAS); the Institute of Food Technologists (IFT); the American Academy of Microbiology (AAM); and the International Academy of Food Science and Technology.

Dr. Wiedmann received a veterinary degree and a doctorate in Veterinary Medicine from Ludwig-Maximilians University in Munich in 1992 and 1994, respectively. He also earned a Ph.D. in Food Science from Cornell in 1997. His research career began in 1992 with investigations on *Listeria monocytogenes*, which remains a key research focus.

Sponsored by Frozen Food Foundation

Institut Mérieux Young Investigator Award in Antimicrobial Resistance

Jasna Kovac
State College, Pennsylvania

Dr. Jasna Kovac is the recipient of the 2019 Institut Mérieux Young Investigator Award in Antimicrobial Resistance. New this year, the award recognizes an active IAFP Member who has shown outstanding ability and professional promise as a researcher in food microbiology/food safety, focusing on antimicrobial resistance.

Dr. Kovac is an Assistant Professor in the Department of Food Science at Pennsylvania State University in State College. She conducts research focused on precision food safety, integrating microbiological and omics methods to improve understanding of the foodborne pathogen and antimicrobial resistance transmission in the food supply chain. Dr. Kovac is using the *Bacillus cereus* group as a model for diverse foodborne pathogen species complex that necessitates strain-level characterization for food safety risk assessment. She made significant contributions to the development of the bioinformatics tool, BTyper, for genome-based characterization of the *B. cereus* group isolates. The BTyper was recently implemented in the first whole genome sequence-based *B. cereus* group foodborne outbreak investigation. Dr. Kovac continues studying the epidemiology of antimicrobial resistance in *Campylobacter*, one of the most common bacterial foodborne pathogens. She is collaborating with partners from academia and government agencies active in the food safety and public health space to address some of the pressing questions related to antimicrobial resistance detection and spread.

Dr. Kovac graduated from the University of Ljubljana with a bachelor's in Microbiology and a Ph.D. in Biosciences/Biotechnology, with a focus on antimicrobial resistance of *Campylobacter*. She was a postdoctoral associate in the Department of Food Science at Cornell University before taking her current position at Pennsylvania State University.

Sponsored by INSTITUT MERIEUX

Food Safety Magazine Distinguished Service Award

Theodora Morille-Hinds
Battle Creek, Michigan

Ms. Theodora Morille-Hinds is the recipient of the 2019 *Food Safety Magazine* Distinguished Service Award. Ms. Morille-Hinds is the Vice President of Global Food Safety and Quality, accountable for food safety, sanitation, quality management systems, auditing, supplier quality management, supplier certification, premiums, packaging quality, and compliance to design, process optimization and co-manufacturer quality for the Kellogg Company in Battle Creek, Michigan.

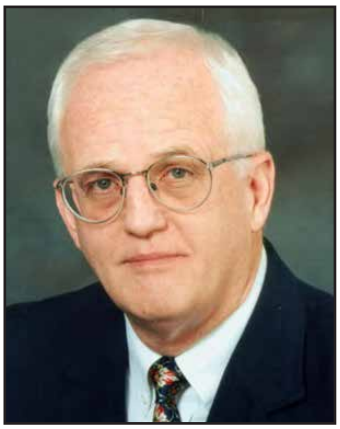
Ms. Morille-Hinds joined Kellogg as a Senior Director of Global Food Safety and Sanitation in July 2011, and was promoted to Vice President of Global Quality Food Safety and Regulatory in November 2013. Prior to joining Kellogg, she spent 25 years with Kraft Foods in various leadership roles including microbiology, research, and R&D.

Ms. Morille-Hinds is on the Editorial Advisory Board of *Food Safety Magazine* and the Food Safety Advisory Board of both the University of Georgia and Tuskegee University. She is currently on the board and a Past President of SSAFE, a global nonprofit organization that works with intergovernmental partners to address emerging issues that have potential to affect the safe supply of food around the world. She is also affiliated with numerous other industry associations.

Ms. Morille-Hinds holds a B.Sc. from York College, City University of New York, and an M.Sc. in Food Microbiology from Long Island University, City University of New York.

Sponsored by FoodSafety magazine

Maurice Weber Laboratorian Award



Larry Beuchat
Griffin, Georgia

Dr. Larry Beuchat is the recipient of the 2019 Maurice Weber Laboratorian Award. This award recognizes an IAFP Member for dedicated and exceptional contributions in the laboratory, and commitment to the development and/or application of innovative and practical analytical approaches in support of food safety.

Dr. Beuchat is a Distinguished Research Professor Emeritus of the Center for Food Safety at the University of Georgia in Griffin. Areas of his research have included microbiology of produce and nuts; methodologies for detecting and enumerating foodborne pathogenic bacteria; yeasts and molds; metabolic injury and resuscitation of bacteria and fungi; relationships of water activity to pathogen survival and growth; antimicrobial compounds; and food preservatives and sanitizers.

Dr. Beuchat has published more than 530 peer-reviewed articles (131 in the *Journal of Food Protection)* and five books on these topics, and has served as an advisor for the National Academy of Sciences; the World Health Organization; Food and Agriculture Organization; and the International Committee on Food Microbiology.

An active member of IAFP since 1972, Dr. Beuchat received the GMA Food Safety Award in 2005; the Harry Haverland Citation Award in 2003; the IAFP Elmer Marth Educator Award and the President's Recognition Award, both in 2001; and the Fellow Award in 1998. He served as Co-Scientific Editor of the *Journal of Food Protection* from 1994–2001. He is also a Fellow of both the Institute of Food Technologists and the American Society of Microbiology.

Dr. Beuchat holds a B.S. in Horticulture from Pennsylvania State University and M.S. and Ph.D. in Food Science from Michigan State University.

Sponsored by WEBER SCIENTIFIC

Larry Beuchat Young Researcher Award

Andrea Moreno Switt
Santiago, Chile

Dr. Andrea Moreno Switt is the recipient of the 2019 Larry Beuchat Young Researcher Award, which recognizes a young researcher who has shown outstanding ability and professional promise in the early years of their career.

Dr. Switt joined the Universidad Andres Bello in Santiago, Chile in 2014 as an Assistant Professor in the School of Veterinary Medicine. In 2018, she was promoted to Associate Professor. In addition, Dr. Switt is also the Co-Director of the Center of Excellence's Millennium Initiative for Collaborative Research on Bacterial Resistance (MICROB-R), a center focusing on establishing the role of humans, the community and the environment, including water, animals and food, in the human acquisition of antimicrobial resistant bacteria. At Andres Bello, Dr. Switt has developed a research program in food safety that includes basic and applied research with food producers and local and international public health institutions.

Dr. Switt is constantly developing innovative research to mitigate foodborne pathogens as her work with *Salmonella* bacteriophages. To date, she has published 37 peer-reviewed papers that have been cited 1,402 times; two book chapters; and one Special Issue that emerged from an international conference she organized under the sponsorship of the OECD.

Dr. Switt joined IAFP in 2012 and placed third in the poster division of the Developing Scientist competition at IAFP 2012. She graduated from the School of Veterinary Medicine at the Universidad de Concepcion (first in her class), where she also received her M.S. in Microbiology. In 2013, she completed her Ph.D. in Food Science and Technology at Cornell University.

Sponsored by BIOMÉRIEUX

Ewen C.D. Todd Control of Foodborne Illness Award

Tanya Roberts
Vashon, Washington

Dr. Tanya Roberts is the recipient of the 2019 Ewen C.D. Todd Control of Foodborne Illness Award. This award recognizes an individual for dedicated and exceptional contributions to the reduction of risks of foodborne illness. Dr. Roberts is currently the Chair of the Board of Directors for the Center for Foodborne Illness Research & Prevention (CFI), serving as a leader in developing policy positions and advocacy efforts. CFI is an all-volunteer food safety and foodborne illness prevention non-profit organization based out of Grove City, Pennsylvania.

Dr. Roberts has been involved in food safety since the late 1970s when the U.S. Department of Agriculture's Economic Research Service (ERS) assigned her the task of conducting a Benefit/Cost Analysis of meat and poultry inspection. Her pioneering work on estimating the human cost of foodborne illness (medical costs and productivity losses) helped raise awareness of the significance of foodborne illness. In 1987, Dr. Roberts testified before the U.S. Senate's Hearing on "Foodborne Illnesses and Deaths." The Centers for Disease Control and Prevention (CDC) was a critical collaborator and provided estimates of the number of cases of foodborne illness and deaths. The Council forAgricultural Science and Technology asked Dr. Roberts to co-chair a study, with Dr. Peggy Foegeding, on "Foodborne Pathogens, Risks and Consequences."

Given the importance of data in providing economic incentives for pathogen prevention and control, Dr. Roberts spear-headed ERS's 1995 conference, "Tracking Foodborne Pathogens from Farm to Table: Data Needs to Evaluate Control Options." The USDA invited her to lead the slaughterhouse module of the *E. coli* O157 risk assessment, leading to publications on the costs of slaughterhouse controls, economics of innovation, and analysis of company strategies.

After retiring from ERS in 2008, Dr. Roberts volunteered with CFI. At the request of IAFP's Springer Book Publishing Committee, she developed the book, *Food Safety Economics: Incentives for a Safer Food Supply*. Intended to communicate economic principles to IAFP Members, the 2018 book includes 18 chapters by international experts.

Sponsored by MARLER CLARK
THE FOOD SAFETY LAW FIRM

Sanitarian Award

Scott Burnett
Lakeville, Minnesota

The 2019 Sanitarian Award goes to Dr. Scott Burnett. The Sanitarian Award honors an IAFP Member for dedicated and exceptional service to the profession of the sanitarian serving the public and the food industry. Dr. Burnett is a Principal Scientist with Post Consumer Brands' Corporate Quality and Food Safety Department in Lakeville, Minnesota. His work focuses on enhancing and verifying environmental microbiological and hygiene controls; food manufacturing sanitation technology development; and thermal process validation of low-moisture food products. Previously, Dr. Burnett was the Research and Development Director of Food Safety in Ecolab's Global Food and Beverage Division, and has held food safety and sanitation leadership positions at MOM Brands and Land O'Lakes, all in Minnesota.

An IAFP Member since 1999, Dr. Burnett was co-founder of the Student Professional Development Group, has presented at many IAFP Annual Meetings, actively participates in PDGs, and has served on several award selection committees. He is currently on the Editorial Board for the *Journal of Food Protection* and is a member of the IAFP Affiliate, the Minnesota Food Protection Association. He received the IAFP President's Recognition Award in 2000.

Dr. Burnett has authored or co-authored 12 peer-reviewed scientific publications, seven issued patents, and has presented or taught at multiple food safety-focused venues around the world. He earned his Ph.D. at the Center for Food Safety at the University of Georgia and holds a B.Sc. in Microbiology and a B.A. in Spanish from Montana State University.

Sponsored by ECOLAB

Elmer Marth Educator Award

Marcel Zwietering
Wageningen, The Netherlands

Dr. Marcel Zwietering is the recipient of the 2019 Elmer Marth Educator Award, which recognizes an IAFP Member for dedicated and exceptional contributions to the profession of education. Dr. Zwietering is a Professor at Wageningen University in Wageningen, The Netherlands, where he currently instructs students in B.Sc. and M.Sc. programs, as well as courses for Ph.D.

After obtaining his M.Sc. in Biotechnology at Wageningen University in 1987 and his Ph.D. in 1993, Dr. Zwietering continued at the university in the Food Process Engineering group as a tenured Assistant Professor. As an Associate Professor in 1996, he taught core engineering courses, such as mass transfer, and applied courses, such as food fermentation.

Dr. Zwietering worked for Danone in France from 1998–2002 and returned to Wageningen in 2003 as Professor in Food Microbiology. His research chair developed a private online B.Sc. course for NTU University in Singapore, as well as courses for an online international M.Sc. food technology program. With the Toxicology Chair, Dr. Zwietering developed the Food Safety MOOC that has received a large international audience.

Dr. Zwietering joined IAFP in 2009, and has served on the Organizing Committee for several European symposia. He currently serves on the Editorial Board for the *Journal of Food Protection*.

In 2005, Dr. Zwietering was elected as member of the International Commission on Microbiological Specifications for Foods and has contributed to various sampling plan workshops all over the world, as well as a series of YouTube knowledge clips. He serves as Co-Chair of the ILSI – Europe Microbiological Food Safety Task Force.

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Harold Barnum Industry Award

Ken Davenport
Saint Paul, Minnesota

As the recipient of the 2019 Harold Barnum Industry Award, Dr. Ken Davenport is being honored for his dedication and exceptional service to IAFP, the public, and the food industry.

Dr. Davenport is a Laboratory Manager at the 3M Food Safety Department in Saint Paul, Minnesota, responsible for product and technology development teams for novel food safety solutions. Under his leadership, his team launched impactful products, including 3M™ Molecular Detection System, Rapid Petrifilm™ Products, and Lactic Acid Bacteria Petrifilm™ Plate.

While at 3M Food Safety, Dr. Davenport has also served as a Global Technical Services Specialist, a Six Sigma Black Belt, and Product Development Manager. His career began at Biotrace, becoming Vice President of Technical Services in 2003.

Dr. Davenport has presented hundreds of food safety educational seminars and workshops in more than thirty countries. He has spoken on topics spanning Biofilms, ATP Detection, Risk-based Sampling, *Listeria* Control, Pathogen Detection, Environmental Monitoring, and Leadership.

Dr. Davenport joined IAFP in 2007 and has been a very active Member, chairing the Food Chemical Hazard and Food Allergy PDG and the Food Packaging PDG. He is also a member of the Hygiene and Sanitation PDG. He has co-led the Chair/Vice Chair team and introduced a novel Parallel Ideation Process to streamline the collection of ideas for symposia and roundtables in PDG meetings. He is also a Member of the IAFP Affiliate, the Wisconsin Association for Food Protection.

Dr. Davenport holds a degree in Chemistry from Spring Arbor University, an M.B.A. from the University of Minnesota, and a Ph.D. from the Department of Biochemistry at Rice University. He has been married to Theresa for 26 years, has three children, and tends a vineyard in western Wisconsin, making wine in his spare time.

Sponsored by NSF

Travel Award for Food Safety Professionals in a Country with a Developing Economy

Charles Bashiru Bakin
Food and Drugs Authority
Wa, Upper West Region,
Ghana

Charles Bashiru Bakin is a recipient of the 2019 Travel Award. Mr. Bakin is a Food Safety Officer with the Food and Drugs Authority in Ghana, where he provides training and technical assistance in the implementation of food safety systems and is responsible for auditing food businesses to ensure they demonstrate commitment to responsible safe food production. Prior to his current position, he worked briefly with MARS GmbH, European Headquarters in Verden, Germany, in the Supplier Quality Assurance Department.

Mr. Bakin has a broad range of interests that cover many aspects of food safety and quality, including food safety and quality management systems; food safety risk analysis; food safety inspections; food regulation and control; antimicrobial resistance; and sustainable food systems.

Mr. Bakin holds an M.Sc. in Sustainable Food Systems, a European joint degree offered by a consortium of six universities (University of Kassel and Fulda University of Applied Science, both in Germany; Ghent University in Belgium; Aarhus University in Denmark; Institut Supérieur d'Agriculture et d'Agroalimentaire Rhône-Alpes, ISARA-Lyon in France; and the University of Agricultural Science and Veterinary Medicine of Cluj-Napoca, USAMV Cluj in Romania). He earned his B.Sc. in Nutrition from the University for Development Studies in Ghana.

Mr. Bakin is an alumni of the International Training Programme (ITP) in Food Safety, Quality Assurance and Risk Analysis, Ghent University, for which he was awarded a VLIR-UOS scholarship in 2014. He is a member of the Allied Health Professionals Council (AHPC), Ghana.

Abdoulie Jallow
Food Safety and Quality
Authority of The Gambia
Serrekunda, Gambia

Abdoulie Jallow is a recipient of the 2019 Travel Award. Mr. Jallow is a Scientific Officer at the Food Safety and Quality Authority of The Gambia, the sole national competent authority in charge of official control of food safety and quality control in the country. In this role, he is responsible for identification of food safety risks in the national food value chain, along with risk profiling and data collection and analysis, among other responsibilities. Mr. Jallow recently completed the development of a risk profile of *Salmonella* in Gambian raw cow milk. He has undergone training in microbiological and chemical risk assessment, all supported by the Food and Agriculture Organization (FAO).

Mr. Jallow is an executive member and co-founder of the Gambian Quality Association, a youth-led professional association that seeks to advocate and work towards standardization and implementation of safety and quality systems in Gambian products and processes with a special focus on agricultural products. Its main objective is to considerably reduce the frequency of rejections that Gambian food products face in the international market, especially due to food safety-related issues. Within this association, Mr. Jallow is currently working with Aspuna Gambia LTD, a local cassava processing company, helping the company attain HACCP certification to boast export market access.

Under a government scholarship, Mr. Jallow obtained his bachelor's in Food Processing Engineering in 2016.

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Travel Award for Food Safety Professionals in a Country with a Developing Economy

Ismail Ayoade Odetokun
University of Ilorin
Ilorin, Nigeria

Ismail Ayoade Odetokun is a recipient of the 2019 Travel Award. Dr. Odetokun is a Senior Lecturer/Assistant Professor and acting Head in the Department of Veterinary Public Health and Preventive Medicine at the University of Ilorin in Ilorin, Nigeria, where he teaches undergraduate students within the Doctor of Veterinary Medicine (DVM) program. Though he is an early career academics/researcher, he is highly motivated to conduct food safety research as it affects public health. His specific interests are in the areas of foodborne diseases, food hygiene, and antimicrobial resistance (AMR) in the food chain.

At the university, Dr. Odetokun also serves on various committees in an administrative capacity. He is a former member of the Scientific Committee of the first GHI Conference on Food Safety and Security, and is a current member of several professional and scientific associations, with several publications to his credit. Dr. Odetokun completed his Doctor of Veterinary Medicine (DVM); Master of Veterinary Public Health; and Ph.D. in Veterinary Public Health, all from the University of Ibadan. During his studies, he received several national and international scholarships and prizes, including the 2013 IAFP Student Travel Scholarship.

As an early career researcher, Dr. Odetokun seeks strong collaborative networks, mentorship, and guidance in his goal to be a next generation expert on food safety and AMR. He hopes to eventually become a university professor, with a highly competitive scientific capability, producing accomplished undergraduate and postgraduate students while conducting evidence-based scientific research leading to disease control and the establishment of food safety policies to improve public health, especially in developing countries like Nigeria.

At IAFP 2019, Dr. Odetokun is eager to interact with the stakeholders in food protection from around the world to foster regional and international cooperation with the aim of developing cutting-edge research in the near future.

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Travel Award for State or Provincial Health or Agricultural Department Employees

Gregory Danzeisen
Minnesota Department of Agriculture
Saint Paul, Minnesota

Gregory Danzeisen is a recipient of the 2019 Travel Award. Mr. Danzeisen is a Research Scientist with the Microbiology Section of the Minnesota Department of Agriculture (MDA) Laboratory Services Division in Saint Paul, Minnesota. He earned his B.S. and M.S. in Microbiology from North Dakota State University in Fargo.

Mr. Danzeisen began his career in Food Microbiology in 2010 working for MDA before moving to Eurofins Microbiology Laboratories, where he spent five years as a Senior Microbiologist. He recently returned to state service with MDA as a Research Scientist. In this role, his primary focus is evaluating, validating, and employing detection methods for various foodborne pathogens, including *Campylobacter*, *Salmonella*, Shiga-toxin producing *E. coli*, and *Listeria*. In addition, he is working on rapid confirmation methods for pathogens, including MALDI-TOF.

Mr. Danzeisen is an instructor with the USDA Food Safety Inspection Services (FSIS) FERN Training Center in Minnesota. He teaches current methodology for detection and isolation of foodborne pathogens to FERN scientists from across the country. He also serves as the Vice President for the IAFP Affiliate, the Minnesota Food Protection Association, whose mission is to provide a forum for information exchange pertaining to the protection of the food supply to food safety professionals in the state.

Mr. Danzeisen is grateful for the opportunity to attend IAFP 2019 and is looking forward to learning new information from the conference and from fellow attendees.

Ashley Giddens
Worth County Health Department
Sylvester, Georgia

Ashley Giddens is a recipient of the 2019 Travel Award. Ms. Giddens is an Environmental Health Specialist IV for the Worth County Health Department in Sylvester, Georgia. She has been employed as an Environmental Health Specialist in the State of Georgia for twelve years. She began her career in Environmental Health at Lowndes County Health Department in Valdosta, Georgia in 2007, where she served as the District/Standard Trainer and the Food Program Manager before the position was eliminated.

With an expertise in the Food Service Program, Ms. Giddens currently works in all areas of the Environmental Health Program including Food, On-Site Sewage Management, Rabies, Tourist Accommodations, Pools, Body Art, Well Water, and Emergency Preparedness. Since joining the department, she has trained in all aspects of the Food Program and currently serves as the sole District Standard/Trainer for the 14-county health district. Ms. Giddens' duties include ensuring that staff are properly trained in the Food Program and that all staff are standardized to State requirements. Working in both metropolitan and rural communities as well as having food safety responsibilities during two natural disasters has given her a unique perspective.

Ms. Giddens earned her B.S. in Biology from Valdosta State University. She is a member of the Georgia Environmental Health Association and the Georgia Environmental Health Strike Team.

Ms. Giddens is thrilled with the opportunity to attend IAFP 2019.

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Travel Award for State or Provincial Health or Agricultural Department Employees

Emily Harvey
Massachusetts Department of Public Health
Boston, Massachusetts

Emily Harvey is a recipient of the 2019 Travel Award. Ms. Harvey is an Epidemiologist in the Bureau of Infectious Disease and Laboratory Sciences for the Massachusetts Department of Public Health (MDPH) in Boston. She is currently one of two Foodborne/Waterborne Disease Project Coordinators, sharing her duties with past Travel Award recipient, Johanna Vostok. Together, they oversee the investigation and reporting of foodborne illness outbreaks to the Centers for Disease Control and Prevention (CDC).

Ms. Harvey is also one of the founding members and current coordinators of the Department's Working Group on Foodborne Illness Control, a collaboration of epidemiology, environmental health, local boards of health, and laboratory peers who meet regularly to discuss current foodborne illness outbreaks and best practices in outbreak and case investigation. She assists in the development of protocols related to epidemiological response for non-vaccine prevenable diseases and serves as a resource for local health departments, academia, and other public health professionals.

Ms. Harvey has enjoyed a long and fulfilling career in public health since joining MDPH's Bureau of Environmental Health Food Protection Program in 1983, where she has honed her environmental health specialist skills as a wholesale food inspector, and became both a Registered Sanitarian and federally certified as an Evaluation Officer in Food Service and Retail Foods. She concluded her tenure in the Food Protection Program as the Supervisor of the Local Health Operations Unit, which oversaw the audits of local food establishment programs, training, and education to local health and industry partners.

Upon joining the Division of Epidemiology in 1988, Ms. Harvey has been the fortunate recipient of numerous trainings, workshops, and seminars, allowing her continued growth as a public health professional. She holds a B.S. in Public Health from the University of Massachusetts in Amherst.

Ms. Harvey is honored and excited to attend her first IAFP Annual Meeting in Louisville.

Mona Johnson
Virginia Division of Consolidated Laboratory Services
Richmond, Virginia

Mona Johnson is a recipient of the 2019 Travel Award. Ms. Johnson is the Senior Scientist for the Food Emergency Response Network (FERN) at the Virginia Division of Consolidated Laboratory Services (DCLS) in Richmond. Her responsibilities include validation of new methods to isolate and/or characterize foodborne pathogens; providing QA guidance and technical training for personnel within the section; and overseeing QA procedures of the lab in support of ISO/IEC 17025 standards.

With a B.S. in Biological Sciences and an M.S. in Food Science and Technology, both from Virginia Tech, Ms. Johnson started her career in food safety as the Project Manager for Product Development and Quality for a prepared foods and bakery manufacturer in Richmond. Since joining DCLS in 2017, she has worked in the Food Microbiology laboratory, overseeing daily operations within the lab, which provides testing for the Commonwealth of Virginia. The lab also provides testing performed in collaboration with federal partners at the U.S. Department of Agriculture's Food Safety and Inspection Service and the Food and Drug Administration within the FERN Microbiology Program.

Ms. Johnson is grateful for the opportunity to attend a meeting that provides a platform to learn about new testing technologies, as well as information regarding novel pathogens, food vehicles, and emerging issues in food safety.

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Travel Award for State or Provincial Health or Agricultural Department Employees

Lorraine McIntyre
BC Centre for Disease Control
Vancouver, British Columbia, Canada

Lorraine McIntyre is a recipient of the 2019 Travel Award. Ms. McIntyre is a Food Safety Specialist with Environmental Health Services at the British Columbia Centre for Disease Control (BCCDC) in Vancouver, British Columbia, Canada. She earned her B.Sc. from the University of British Columbia and M.P.H.Sc. from the University of Hertfordshire in Hatfield, United Kingdom.

Ms. McIntyre's career began as a plant pathologist technician working on canola, as a research technician on *Giardia,* and as a medical assistant before joining BCCDC in 1993, where she has worked for more than 25 years. Beginning in the laboratory division, she supervised and coordinated water, food, and gastroenteritis outbreaks before moving to Environmental Health. Ms. McIntyre investigates food issues and outbreaks, conducts applied research, and serves as a technical specialist providing advice to health inspectors. In addition, she has led several multi-stakeholder groups to create guidance on a range of topics, such as best practices for sous vide and food distribution organizations, and enjoys mentoring student projects.

Ms. McIntyre currently chairs a national working group to create fermented food guidance and serves on the Health Canada food expert advisory group. She has been a proud Member of IAFP since 2003 and of the IAFP Affiliate, the British Columbia Food Protection Association, since 2005.

Ms. McIntyre is grateful for the opportunity to attend IAFP 2019 in Louisville to learn about current food safety issues.

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Student Travel Scholarship Award

Hiroki Abe
Hokkaido University
Sapporo, Japan

Hiroki Abe is a first-year Ph.D. candidate in the Department of Agriculture at Hokkaido University in Sapporo, Japan, where he also obtained his undergraduate and master's degrees. Inspired by an early childhood experience of intense food poisoning, Mr. Abe elected to focus his academic studies on conducting research on predictive microbiology. He is currently working on developing a stochastic approach describing individual cell heterogeneity during thermal inactivation and, most recently, in the human body. He has authored/co-authored four articles published in three food safety journals.

Mr. Abe is tremendously honored to be chosen as a recipient of the Student Travel Scholarship to attend IAFP 2019, allowing him to share his recent results in stochastic model describing individual cell heterogeneity, as well as developing relationships with the most prestigious researchers in the microbiological field. His goals are to contribute to build a world where people can enjoy delicious food without worry of food poisoning.

Jennifer C. Acuff
Virginia Tech
Blacksburg, Virginia

Jennifer Acuff is a Ph.D. student in the Department of Food Science and Technology at Virginia Tech in Blacksburg, under the direction of Dr. Monica Ponder, as well as Drs. Robert Williams, Haibo Huang, and Daniel Gallagher. Ms. Acuff earned a B.S. in Biology at Abilene Christian University and an M.S. in Food Science at Kansas State University, where her research focused on food microbiology and safety.

Ms. Acuff currently researches low water activity food (LWAF) safety, specifically regarding nuts and dried fruits. LWAF producers face unique challenges when addressing the safety of their ready-to-eat products while still maintaining quality standards. Ms. Acuff is passionate about learning what challenges food processors face and how scientists can provide tools and solutions to promote LWAF safety. Her current research examines the efficacy of low-temperature, vacuum-assisted steam on various LWAF that are contaminated with STEC, *L. monocytogenes*, and *Salmonella* spp., while also seeking a suitable surrogate organism for this process.

As a teaching assistant, Ms. Acuff also helps instruct Food Microbiology and Fermentation Microbiology courses at Virginia Tech. She enjoys teaching and working with undergraduate students, believing these courses offer unique opportunities to provide food safety education to students and promote positive food safety practices that they may share in their respective communities.

Since joining IAFP in 2013, Ms. Acuff has participated in numerous PDGs and presented her research at several Annual Meetings. IAFP activities and Members have played an integral role in her scholarship and professional development by providing her with valuable opportunities to help plan symposia and work with other food safety enthusiasts.

Ms. Acuff is extremely honored to receive the IAFP Student Travel Scholarship to attend this year's Annual Meeting, where she will present findings from recent experiments that examine the efficacy of steam in reducing pathogens on raisins. She is excited for this opportunity to share her research, learn from experts in the field, and develop partnerships with other members of the food safety industry.

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Student Travel Scholarship Award

Justin Anast
Iowa State University
Ames, Iowa

Justin Anast is currently a Ph.D. student in the Interdepartmental Microbiology program at Iowa State University in Ames, Iowa, under the supervision of Dr. Stephan Schmitz-Esser. Mr. Anast received his B.S. in Microbiology from the University of Idaho in 2016. During his undergraduate studies, he worked as a research assistant in biology and chemistry research labs, as well as a teaching assistant for the Chemistry Department.

Mr. Anast's doctoral thesis research focuses on the foodborne pathogen, *Listeria monocytogenes,* during competition with food bacteria. He aims to uncover what genes are utilized by *Listeria* during co-culture using transcriptomics. Another focus of his research is to elucidate the role of a rearrangement hotspot protein (RHS) in competition. RHS proteins have been shown in other bacteria to mediate competition. This work may reveal novel targets of counter measures to *Listeria* in human foods and the food production environment.

Mr. Anast also studies the genomes of *Brevibacterium* strains from Austrian mountain cheese rinds and how they may adapt to the cheese rind environment. This study has uncovered a novel *Brevibacterium* plasmid and the ability to degrade histamine. Elevated levels of histamine in fermented foods have led to histamine intoxication in susceptible people. This study has yielded him a first author publication.

Mr. Anast is pleased to receive the Student Travel Scholarship to attend IAFP 2019, hoping to use this opportunity to learn as much as possible about the food industry challenges regarding improvement of food security, as well as network with food safety professionals. After completion of his doctorate degree, he hopes to have a career in the food industry to continue his goal of contributing to better food safety.

Katrien Begyn
Ghent University
Ghent, Belgium

Katrien Begyn is a Ph.D. student at the Research Unit of Food Microbiology and Food Preservation (FMFP-UGent) of the Department of Food Technology, Safety and Health, located at the Faculty of Bioscience Engineering of Ghent University, Ghent, Belgium. Since graduating in 2014 with her M.Sc. in Biomedical Sciences, Ms. Begyn has been working on different short-term research projects, i.e., *Clostridium botulinum* spores, microwave heating, and detection of food pathogens in food products using PCR.

Ms. Begyn's doctoral research focuses on the impact of *Bacillus cereus* endospore evolution on food safety, with an emphasis on UV and wet heat stress. This research project is a cooperation between three Belgian institutes with extended knowledge of *B. cereus*: FMFP-UGent (Ghent University); the Centre for Food and Microbial Technology, Department M2S, member of Leuven Food Science and Nutrition Centre (LFoRCe, KU Leuven); and Flanders Research Institute for Agriculture, Fisheries and Food, Technology and Food Science, Food Safety Unit (ILVO). The project's objective is to assess the potential impact of *B. cereus* endospore evolution in the food production chain at the molecular, population, and industrial levels.

Ms. Begyn received the 2018 European Student Travel Scholarship to attend IAFP's European Symposium on Food Safety in Stockholm, Sweden, and is grateful to receive this year's Student Travel Scholarship. She looks forward to meeting and networking with food safety professionals from academia, government, and industry to exchange knowledge and establish new collaborations. Ms. Begyn will present some of her latest research results during IAFP 2019.

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Student Travel Scholarship Award

Melanie Firestone
University of Minnesota
Minneapolis, Minnesota

Melanie Firestone is a Ph.D. candidate in the Division of Environmental Health Sciences at the University of Minnesota's School of Public Health in Minneapolis, under the supervision of Dr. Craig Hedberg, co-director of the Minnesota Integrated Food Safety Center of Excellence. Ms. Firestone received her B.S. in Health and Exercise Science from Wake Forest University and her M.P.H. in Epidemiology from Columbia University. After completing her master's degree, she worked as a research scientist at the New York City Department of Health and Mental Hygiene, where she first developed an interest in foodborne illness epidemiology.

Ms. Firestone's current doctoral work focuses on developing a framework to enhance understanding of the relationship between restaurant inspections, food exposures, and risk of illness to identify opportunities for foodborne illness prevention. She recently published an article in the CDC's journal, *Emerging Infectious Diseases,* showing a decline in *Salmonella* infections in New York City after the implementation of a letter grade program for restaurant inspections. Additionally, she co-authored an article in *Food Protection Trends* about root cause analysis in the food industry as a direct result of her attendance at IAFP 2017.

Upon completing her Ph.D., Ms. Firestone is interested in continuing research that can directly inform public policy to reduce the burden of foodborne illnesses. She is honored to be a recipient of this year's IAFP Student Travel Award and looks forward to representing the public health perspective while expanding her understanding of the global food system.

Catherine Gensler
University of Connecticut
Storrs, Connecticut

Catherine Gensler is completing her M.Sc. in the Department of Animal Science at the University of Connecticut in Storrs, under the direction of Dr. Dennis D'Amico. Ms. Gensler received a B.S. in Food Science from the University of Massachusetts – Amherst in 2016. Her interest in food safety grew out of high school experiences competing in the Science Olympiad event, "Disease Detectives," which focused on foodborne illness outbreaks.

Ms. Gensler's research focuses on evaluating the use of commercially available protective cultures to control *Listeria monocytogenes* and Shiga-toxin producing *Escherichia coli* in soft, surface-mold ripened raw milk cheese. Manufacturing pathogenic cheese in the lab has been a highlight for her this past year – ask her about it! She is passionate about educating everyday consumers about the wonders of food science and safety. After graduation, she looks forward to supporting food safety education work with small producers and entrepreneurs in an extension capacity.

Ms. Gensler is honored to receive a Student Travel Scholarship to attend IAFP 2019. She is excited to share her research, connect with other students, and network with extension professionals and members of the food safety community. Ms. Gensler would like to acknowledge the unwavering support of her research advisor, Dr. D'Amico, undergraduate mentor Amanda Kinchla, her lab mates, and the student PDG Officer team.

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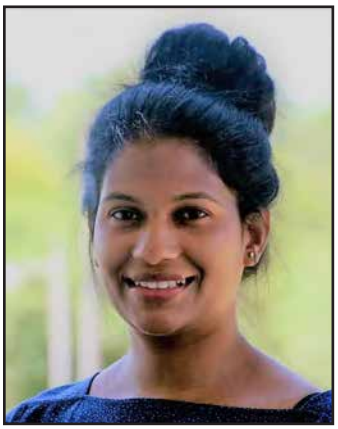
Student Travel Scholarship Award

Carly Gomez
Michigan State University
East Lansing, Michigan

Carly Gomez is an M.S. candidate in Biosystems Engineering at Michigan State University in East Lansing, under the supervision of Dr. Bradley Marks, and where she also completed her B.S. As an undergraduate, Ms. Gomez studied high-temperature water activity of low-moisture foods, modeled the negative economic impact of low-moisture food recalls, and developed a risk model for listeriosis in cancer patients who consume fresh salad.

During her graduate studies, Ms. Gomez is continuing the risk modeling project, using engineering approaches to develop improved risk models for foodborne illness in cancer patients, modeling bacterial survival during hyper-hygienic preparation processes, and conducting risk analyses of foodborne illness and nutritional impacts in immunocompromised populations following neutropenic diets. She plans to continue this work through her doctoral studies, with the end goal of developing patient-centered educational materials and training for produce preparation in healthcare facilities.

Ms. Gomez is honored to be a recipient of this year's IAFP Student Travel Scholarship. It will be her first time attending IAFP's Annual Meeting, where she plans to share her work with recall and risk modeling. She is excited to meet food safety experts from around the world, engage in conversations about integral problems and solutions in food safety, and receive feedback on her work.



Gayathri Gunathilaka
Michigan State University
East Lansing, Michigan

Gayathri Gunathilaka is a Ph.D. candidate in the Department of Food Science and Human Nutrition at Michigan State University in East Lansing, under the supervision of Professor Elliot Ryser. Ms. Gunathilaka earned her M.Sc. in Food Science and Nutrition with a concentration on food microbiology from Wayne State University and received her B.Sc. in Agriculture, Technology and Management from the University of Peradeniya in Sri Lanka.

Ms. Gunathilaka's research findings on food safety were documented in several peer-reviewed publications, where she was the first author for two high-impact publications in the field. Her current research focuses on optimizing the conditions for engineered nanoparticles (ENP) removal in an existing fresh-cut pilot-scale processing line. In her research, residual ENPs on fresh produce are evaluated and the conditions are optimized for ENP removal in processing practices, thus contributing to the reduction of ENP-related food safety risks and protecting humans.

Ms. Gunathilaka is incredibly honored to be a recipient of the Student Travel Scholarship to attend IAFP 2019, where she will be presenting her current research findings in a poster session. She is excited to share her research with food safety professionals from around the world, which will provide her the opportunity to broaden her knowledge on food safety and obtain more information related to her research.

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Student Travel Scholarship Award

John "Jack" Hodges
University of Houston
Houston, Texas

John "Jack" Hodges is a junior undergraduate student at the Conrad N. Hilton College of Hotel and Restaurant Management at the University of Houston in Houston, Texas. Mr. Hodges is jointly pursuing a B.S. in Hotel and Restaurant Management and an M.S. in Hospitality Management. He plans to pursue his Ph.D. in Hospitality Administration to enter academia and apply innovative analytics and technology to the foodservice industry.

Mr. Hodges comes from an extensive background in the hospitality industry, which aids him in developing practical applications for food safety training and education. Over the past year, he has been studying the effect of foodborne illness on restaurant patrons' satisfaction through online review channels and the use of big data analytics to monitor foodborne illness outbreaks nationwide. He also studies food safety in emerging foodservice concepts such as food trucks and mobile app food delivery.

Mr. Hodges is extremely grateful to be a recipient of the 2019 Student Travel Scholarship and attend this year's Annual Meeting. While he has presented his work at hospitality conferences, he notes that food safety only takes up a small portion of the proceedings. He is excited to see the full breadth and depth of food safety research and interact with colleagues and experts. Mr. Hodges would like to thank Drs. Sujata Sirsat, Agnes DeFranco, and Minwoo Lee for their invaluable support and mentorship.

Rochelle Keet
Stellenbosch University
Stellenbosch,
Western Cape, South Africa

Rochelle Keet is an M.Sc. student in the Department of Food Science at Stellenbosch University in Stellenbosch, Western Cape, South Africa, under the supervision of Dr. Diane Rip. Ms. Keet received her B.Sc. in Food Science from the university in 2017 and was one of the few recipients awarded the Rector's Award for Excellent Achievement in Academics.

Ms. Keet's master's study is focused on the well-known food pathogen, *Listeria monocytogenes,* and its related virulent strains, which are responsible for causing listeriosis, a disease often fatal for immunocompromised individuals. Despite the significant public health risk posed by virulent strains of *L. monocytogenes,* very little research output has been generated from sub-Saharan Africa regarding the distribution of *L. monocytogenes* strains in the food environment and the associated public health risk. Thus, this study aims to fill in the gap between food and clinical strains, and to investigate potential links between these two areas. She is also investigating the efficacy of a current known listeriaphage to determine whether these phages are effective in controlling virulent strains of *L. monocytogenes.*

Ms. Keet is pleased to receive the Student Travel Scholarship to attend IAFP 2019. She is especially excited to meet researchers working on the same topic and to interact with them, gaining valuable insights that she can apply back home on her own studies. By attending this meeting, she is eager to learn about new advancements in research, innovative ways to utilize resources, and discover new skills or scientific approaches that can help assist with future experiments.

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Student Travel Scholarship Award

Muhammad Nadeem Khan
Quaid-I-Azam University
Islamabad, Pakistan

Muhammad Nadeem Khan is a Ph.D. candidate in the Department of Microbiology, Faculty of Biological Sciences at Quaid-I-Azam University in Islamabad, Pakistan, under the supervision of Dr. Muhammad Imran, where he also received his master's in Food and Nutritional Microbiology. He holds a B.Sc. in Microbiology from Hazara University in Mansehra, Pakistan.

Mr. Khan is currently working on a project aimed to develop economical and effective starter cultures for the dairy industry. He is also researching probiotics and their role in control and management of metabolic diseases. He has co-authored two publications.

During his master's studies, Mr. Khan evaluated the impact of intermittent energy restriction on human physiology and gut microbiome. The aim of this study was to understand the effect of intermittent fasting on the diversity of microorganisms present in the intestine, an effort toward the development of a cost-effective, acceptable and convenient method for the beneficial modulation of human gut microbiota to prevent and manage metabolic diseases. His undergraduate work included isolating, identifying and characterizing *Salmonella* spp. from raw milk, eggs and poultry of the locale and relating its occurrence with the hygienic conditions of dairy farms, poultry farms and slaughter points in the area.

Mr. Khan is honored to receive a Student Travel Scholarship to attend IAFP 2019, with the opportunity to share his knowledge with the global food safety community. He looks forward to such a great platform to meet food safety experts and fellow students, network, and create new contacts in the food safety industry, which are important for his future work and collaborations.

Sakshi Lamba
University College Dublin
Dublin, Ireland

Sakshi Lamba is pursuing her Ph.D. in Molecular Microbiology in the Centre for Food Safety at the University College Dublin (UCD) in Dublin, Ireland, where she also received her M.Sc. in Food Safety and Risk Analysis. A native of India, Ms. Lamba received both an M.S. and a bachelor's in Applied Science in Food Technology from Haryana Agricultural University and the University of Delhi (respectively), both in India.

Ms. Lamba's current research project, "*No-Spores-DFI,*" is funded by the Department of Agriculture, Food and the Marine (Ireland), and integrates fundamental with molecular microbiology to investigate the prevalence, resistance profile, and biofilm production characteristics of spore-forming bacteria within the low-moisture food (LMF) manufacturing environment to further assess the effect of novel control strategies for their decontamination. Her research findings will contribute toward the identification of "hot-spots" translating into quality improvements in LMF production environments. The targeted control measures are expected to enhance the efficiency, performance, and sustainability in the LMF chain. Potential commercialization of the novel approaches will benefit food business operators, in addition to advancing spore and biofilm control in food production industries.

Ms. Lamba has more than five years of professional experience in food safety compliance, academia, and research. Over the years, she has participated in several scientific events, delivered webinars, and developed e-courses addressing food safety professionals.

Ms. Lamba is grateful to receive the Student Travel Scholarship and participate in IAFP 2019. She is excited to present her research findings, engage with the experts in the area, and develop future collaborations with global food safety professionals.

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Student Travel Scholarship Award

Ruiling Lv
Zhejiang University
Hangzhou, China

Ruiling Lv is a Ph.D. candidate at Zhejiang University in Hangzhou, Zhejiang, China, under the supervision of Professor Donghong Liu. Ms. Lv's doctoral research focuses on investigating the effects and mechanisms of ultrasound in combination with other treatments as innovative hurdle technology to inactivate bacterial spores (e.g., *Bacillus cereus*) in different agri-food products.

Ms. Lv is currently a visiting Ph.D. student at the University of British Columbia in Vancouver, Canada, under the supervision of Dr. Xiaonan Lu. Her ongoing research project focuses on the determination and characterization of VBNC *Campylobacter* under stress. As *Campylobacter* remains the leading cause of foodborne bacterial disease in large parts of the developed world, much effort is devoted to improving the detection and elimination of the pathogen. *Campylobacter* may enter a viable but non-culturable (VBNC) state in which it may have the potential to cause human infection but is not detected by the culture method. It is necessary to establish a quick, accurate, and sensitive method to detect VBNC *Campylobacter*.

Ms. Lv has published three first-author papers in top peer-reviewed journals, including *Food Control*; *Applied Microbiology and Biotechnology*; and the *Journal of Food Safety*.

Ms. Lv is honored to be a recipient of the Student Travel Scholarship Award, offering an opportunity to attend IAFP 2019 and meet with thousands of food safety professionals from around the world. She believes that this meeting will be of great benefit for her research.

Ms. Ruiling would like to thank Dr. Lu and Professor Liu for their immense support and help.

Sarah Murphy
Cornell University
Ithaca, New York

Sarah Murphy is a Ph.D. candidate in the Department of Food Science at Cornell University in Ithaca, New York, working under the guidance of Dr. Martin Wiedmann and Dr. Renata Ivanek. She holds a B.S. in Biological Chemistry from Bates College.

Ms. Murphy's background is in the dairy industry, having worked for more than two years in quality assurance at Darigold in Bozeman, Montana, prior to graduate school. Her graduate research is focused on expanding knowledge of microbial dynamics in food systems to develop evidence-based practices that promote lasting impacts to food quality and safety throughout the supply chain. In addition to her research, Ms. Murphy is involved in the Cornell Dairy Foods Extension program, having administered several training sessions and on-site consulting to dairy processors over the past three years. She enjoys mentoring students as well as teaching, and was recently awarded the 2019 Outstanding Graduate TA award in Food Science. Her goal is to establish her own research program focused on food quality systems.

Ms. Murphy is excited to receive the Student Travel Scholarship and looks forward to presenting her research using machine learning to identify predictors of milk spoilage based on quality management practices. She also plans on participating in professional development activities and networking throughout IAFP 2019.

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Student Travel Scholarship Award

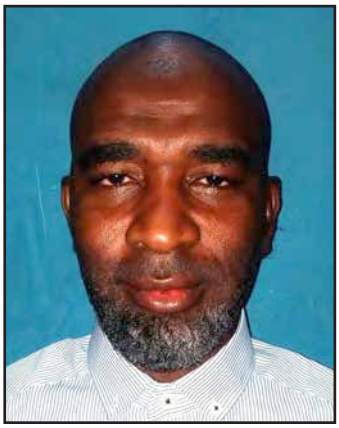
Oladipupo O. Olatunde
Prince of Songkla University
Songkhla, Thailand

Oladipupo Odunayo Olatunde is a Ph.D. candidate in the Department of Food Technology at Prince of Songkla University in Songkhla,Thailand, under the supervision of Dr. Soottawat Benjakul, and co-supervision of Dr. Kitiya Vongkamjan. Mr. Olatunde received his B.Sc. and M.Sc. in Food Science and Technology, both from the Federal University of Agriculture Abeokuta in Nigeria. During his master's studies, he isolated probiotic lactic acid bacteria from effluents generated during the fermentation of *Ogi*, a fermented cereal (maize, millet, and sorghum) and investigated its antimicrobial properties against pathogenic microorganisms.

Currently, Mr. Olatunde's research focuses on the application of non-thermal processing technologies, particularly dielectric barrier discharge high-voltage cold atmospheric plasma (DBD-HVCAP) for inactivation of both pathogenic and spoilage microorganisms in fish. He proposed different inactivation mechanisms for Gram-positive and Gram-negative bacteria. This technology could be implemented in fish processing industries for assuring safety and extending the shelf life of fish and fish products.

Throughout his studies, Mr. Olatunde has attended several international conferences on food microbiology, processing, and waste utilization to share his current research work while developing side projects and publishing seven articles as a first author in international journals with high impact factors. He has also co-authored one additional publication.

Mr. Olatunde is profoundly grateful to receive the Student Travel Scholarship. He will present his recent findings during IAFP 2019, and looks forward to learning about current and emerging trends from worldwide food safety experts with vast experiences.



Nurudeen O. Oloso
University of Pretoria
Pretoria, South Africa

Nurudeen O. Oloso graduated in April 2019 after conducting full-time postdoctoral work in the Department of Production Animal Studies in Epidemiology at the University of Pretoria in Pretoria, South Africa, under the supervision of Professor Folorunso Fasina Oludayo and Professor Henriette vanHeerden. Dr. Oloso is also part of the Faculty of Veterinary Science at the university. He holds a Doctor of Veterinary Medicine (DVM) from the University of Ibadan in Nigeria, where he also earned his master's in Preventive Veterinary Medicine.

A native of Nigeria, Dr. Oloso's eight-chapter doctoral thesis is on "Prevalence and characterization of *Salmonella* isolates originating from the broiler production value chain in Nigeria." From this research and other projects related to food safety in Nigeria, Dr. Oloso has published six manuscripts, which are currently under review or in the course of submission to the university's peer-reviewed journals. One of his research studies demonstrated *Salmonella* as a neglected zoonotic foodborne pathogen in Africa due to the lack of joint continental wise surveillance. Another study contributed data to a project situation analysis of antimicrobial resistance in Nigeria. These and other studies led him to establish the "ONE HEALTH PLATFORM" in disease management in Nigeria.

At IAFP 2019, Dr. Oloso looks forward to meeting professionals from different fields of food safety and interacting with participants from diverse sources to gain knowledge and possible collaborations for future research endeavors. He hopes to pursue the possibility of a postdoctoral program toward becoming an established researcher in food safety and security with the potential of supporting developing countries.

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Student Travel Scholarship Award

Ruth Oni
University of Maryland – College Park
College Park, Maryland

Ruth Oni is a Ph.D. candidate in the Nutrition and Food Science Department at the University of Maryland – College Park. Ms. Oni also obtained both her B.Sc. and M.Sc. in Food Science with a concentration in food microbiology and safety from the university. Under the tutelage of Dr. Robert L. Buchanan, she has honed both her research and technical skills in her field.

Ms. Oni's master's research investigated the survivability of *Salmonella* embedded in manure dust aerosols and deposited on fresh produce leaves during cultivation. At the core of her current doctoral dissertation is research to evaluate certain in-process steps and their potential impact on assessment of *Salmonella* risk during chocolate production, as well as the development of targeted thermal resistance data as critical components for a quantitative microbial risk assessment. Ms. Oni has also collaborated on multiple side research projects, some of which have included work with a multi-national food industry to improve the safety of pet foods, and a multi-university project designed to facilitate integration of simulation modeling techniques into food science courses to help advance student training.

As she approaches the final stages of her graduate education, Ms. Oni feels highly honored to be a recipient of the Student Travel Scholarship and attend IAFP 2019, believing this award could not have come at a better moment! The opportunity to further expand her knowledge based on cutting-edge research that can take on tomorrow's food safety challenges and to connect with some of the very best in the food safety world is simply invaluable.

Elvina Parlindungan
RMIT University
Melbourne, Victoria Australia

Elvina Parlindungan is a Ph.D. candidate in the Department of Food Science and Technology at RMIT University in Melbourne, Victoria, Australia, under the supervision of Associate Professor Oliver Jones and Dr. Bee May. Ms. Parlindungan holds a Bachelor's of Biomedicine with First Class Honors from the University of Melbourne in Australia.

As an undergraduate, Ms. Parlindungan studied in many areas of biomedicine, majoring in cell and developmental biology. She conducted a research project in immunology, exploring on fate determination in cytotoxic T cell using flow cytometry and confocal microscopy. She has received several research scholarships, working on projects at high-profile labs in Australia throughout her undergraduate studies.

Ms. Parlindungan's current research focuses on food microbiology and the effect of stress on a bacteriocin producing strain of *Lactobacillus plantarum* to enhance its survival and stability for improved safety and protection in food application. Her research utilizes a variety of techniques, such as scanning and transmission electron microscopy, spray drying, nuclear magnetic resonance spectroscopy, gas chromatography mass spectroscopy, matrix-assisted laser desorption/ionization, and other microbiological techniques.

Ms. Parlindungan is extremely honored to receive this year's Student Travel Scholarship. During IAFP 2019, she will present her recent research results. Her goal is to learn from experts in the food science field while exchanging knowledge and ideas, and networking with others for potential work and collaboration in the future.

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Student Travel Scholarship Award

Surabhi Rani
University of Maryland – College Park
College Park, Maryland

Surabhi Rani is a Ph.D. candidate in the Department of Nutrition and Food Science at the University of Maryland – College Park under the supervision of Dr. Abani K. Pradhan. Ms. Rani received her Bachelor's of Technology in Bioengineering and Biosciences from the Indian Institute of Technology (IIT) in Guwahati, India. As an undergraduate, she studied host-pathogen interactions of avian viruses, Newcastle disease virus (NDV) and infectious bursal disease virus (IBDV) under different external factors as her bachelor's thesis project.

Ms. Rani's current research focuses on evaluating food safety risk factors associated with *Toxoplasma gondii* (*T. gondii*) infection in the farm-to-fork framework. She is currently working on estimating the prevalence of *T. gondii* in naturally infected food animals in the Animal Parasitic Disease Laboratory (APDL) at the Agriculture Research Services (ARS) with the United States Department of Agriculture (USDA).

Throughout her doctoral studies, Ms. Rani has shared her research at several international and national conferences on food safety and risk analysis. She has four publications as first author – two published and two under review – in high impact journals. She has also co-authored a publication based on a national survey of *T. gondii* in organic pork and lambs consumed in the U.S.

Ms. Rani is incredibly honored to receive this year's Student Travel Scholarship. She is excited to attend and present at IAFP 2019 and receive feedback on her recent findings. Her goal is to share information, collaborate with research leaders, and develop research ideas.

H. Lester Schonberger
Virginia Tech
Blacksburg, Virginia

H. Lester Schonberger is a Ph.D. candidate in the Department of Food Science and Technology at Virginia Tech in Blacksburg, advised by Dr. Renee Boyer, with Drs. Melissa Chase, Tiffany Drape, and Sarah Misyak serving on his graduate committee. Mr. Schonberger holds a B.S. from Virginia Tech in Food Science and Technology with minors in Political Science, as well as Leadership and Social Change, having always been interested in the intersections of food with policy and how those can impact social change movements. He has explored this intersection within the United States, as well as during global education opportunities in Ecuador, Cuba, Argentina, and Antarctica.

Mr. Schonberger serves as the graduate assistant for the Campus Kitchen at Virginia Tech, a university food recovery program that delivers safe, quality food for food access organizations in the local community. This work inspired his research to identify opportunities for increased food safety education and support for food recovery organizations through cooperative extension.

Mr. Schonberger believes that safe food should be accessible to all consumers, regardless of where, when, and how they receive it. Some of his work was published in the July/August 2018 issue of *Food Protection Trends*. He also serves on the Food Recovery and Publication Committees within the Conference for Food Protection.

An IAFP Member since 2016, Mr. Schonberger has presented his research and co-organized symposia at several Annual Meetings. This year, he will continue to co-organize symposia and several Student PDG programs, for which he is also a leadership team member.

Mr. Schonberger is pleased to have been selected as a recipient of the Student Travel Scholarship to attend IAFP 2019 and looks forward to continuing his development of professional relationships within the membership. His career interests include community-based education, service learning, non-profit leadership and development, and continuing scholarly research.

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Student Travel Scholarship Award

Mary Kathrynn Yavelak
North Carolina State University
Raleigh, North Carolina

Mary Kathrynn Yavelak completed her M.S. in Food Science with a minor in Psychology in May 2019 from North Carolina State University in Raleigh. Ms. Yavelak also earned her B.S. in Food Science from North Carolina State University. Over the past five years, she has been advised by Dr. Benjamin Chapman and has dedicated research efforts to food preparation behaviors in community and retail settings.

Throughout her graduate career at North Carolina State University, Ms. Yavelak's research focused on food safety education at temporary events, with an emphasis on the risk of Shiga toxin-producing *Escherichia coli* (STEC) foodborne illness from beef. During this time, she also developed a youth food safety program to educate young consumers on managing the risk of STEC in beef from farm to fork. Ms. Yavelak's other research interests include modernizing current approaches to risk communication using various social media platforms and helping develop consumer and retail food safety programs through the North Carolina Cooperative Extension. She plans to use her research experience to impact consumer food safety educational efforts, both nationally and worldwide.

Ms. Yavelak is extremely proud to receive the 2019 Student Travel Scholarship from such an exceptional association. She attended her first Annual Meeting in 2016 in St. Louis, Missouri, and hasn't missed a meeting since! As Chair of IAFP's Student Professional Development Group, Ms. Yavelak has expanded her network of food safety professionals and is excited to utilize this opportunity to foster new professional relationships, gain additional knowledge about current food safety topics, and give back to an association that has meant so much during her career as a student.

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Peanut Proud Student Scholarship Award

The Peanut Proud Student Scholarship Award provides a $2,000 academic scholarship and travel funding for a U.S. student in the field of food microbiology – specifically in the area of peanuts and peanut butter food safety – to attend the Annual Meeting. Peanut Proud is a nonprofit industry organization based in Georgia.

Kaitlyn Casulli
Michigan State University
East Lansing, Michigan

Kaitlyn Casulli is pursuing her Ph.D. in Biosystems Engineering at Michigan State University (MSU) in East Lansing. Ms. Casulli's dissertation focuses on relating heat and mass transfer kinetics to microbial inactivation during dry roasting, using peanuts as a case study. This is a collaborative effort between MSU, Rutgers University, and an industry partner. She is currently developing a model to simulate *Salmonella* inactivation on shelled peanuts in a flat-bed roaster, with a goal of relating the predicted inactivation to salmonellosis risk in roasted products. She was recently awarded an outstanding graduate research fellowship in her department for this work.

In addition to her Ph.D. project, Ms. Casulli has made several contributions to the peanut industry through consulting. Her projects have included developing a peer-reviewed risk assessment for *Salmonella* in peanuts and performing thermal profiling of commercial-scale flat-bed peanut dry roasters. These projects sparked her interest in the peanut industry and helped lay the groundwork for her dissertation topic. Her long-term research goals include quantifying physical and microbiological inactivation variability in a broad range of commercial-scale processes to help inform risk assessments. The industry will ultimately be able to use this information to determine how process variables impact variability in the interest of reducing foodborne illness risk.

Ms. Casulli also participates in numerous service activities at Michigan State University. Most recently, she was elected treasurer for the Council of Graduate Students (COGS). Another role within COGS included revitalizing and chairing the Mental Health Committee, which organized MSU's first celebration of World Suicide Prevention Day. In addition, Ms. Casulli has served on several university committees tasked with mental health reform and supporting students with disabilities. In her department, she has served as chair of the Graduate Student Advisory Group; her efforts have included providing a supportive physical and social environment for graduate students.

Ms. Casulli received the IAFP Student Travel Scholarship in 2016.

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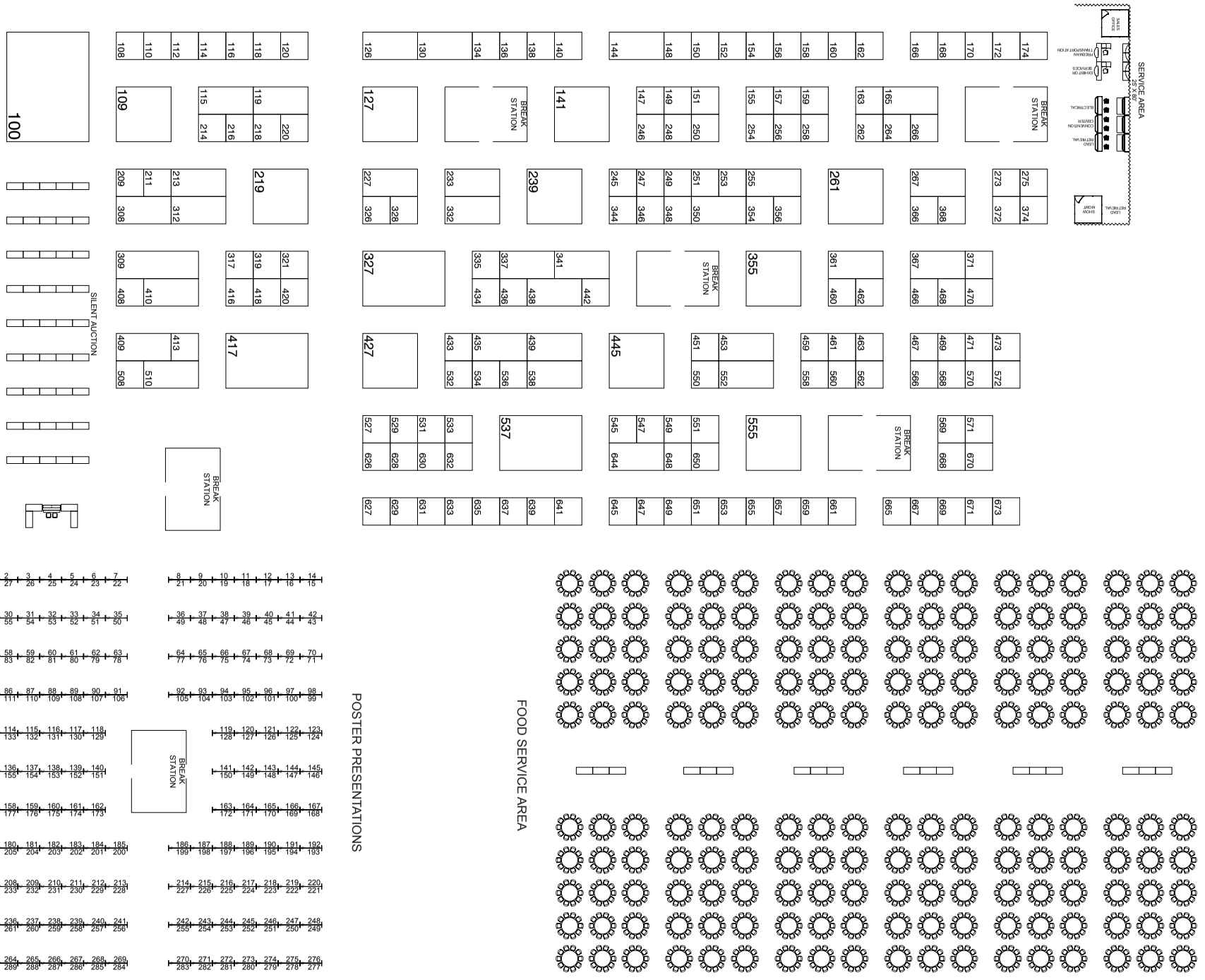

EXHIBITORS – ALPHABETICAL LISTING

(As of June 19, 2019)

EXHIBITORS BY BOOTH NUMBER

(As of June 19, 2019)

2019 EXHIBITORS

3-A Sanitary Standards, Inc. **461**
6888 Elm St., Suite 2D
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www.3-a.org

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Phone: +1 301.644.3206
www.a2la.org

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AEMTEK, Inc. is an accredited laboratory that provides microbiological testing, research, training, and consulting services for the food, water, supplement, and pharmaceutical industries. We deliver science-based and practical solutions for clients in areas including food safety, product quality, shelf-life determination, process validation, and environmental monitoring. Please reach out to see how we can meet your analytical needs!

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Alliance for Advanced Sanitation **558**
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Lincoln, NE 68588-6205, USA
Phone: +1 847.778.0567
http://sanitationalliance.org

The Alliance for Advanced Sanitation is a public-private partnership dedicated to addressing key food safety challenges. Members of the Alliance include industry and academia under the auspices of the University of Nebraska-Lincoln. The Alliance supports and leads research, education and innovation for identifying and evaluating new and improved materials fit for food manufacturing and allied environments to better control pathogens and biofilms, identify improved products and methods of cleaning and improve the effectiveness and ecological friendliness of cleaning agents for all types of manufacturing processes.

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API Group – LGC **262**
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Arizona and California Leafy Greens Marketing Agreement **661**
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https://www.arizonaleafygreens.org

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Art's Way Scientific is a leading producer of technical turnkey research, vivarium, and diagnostic laboratories. Art's Way designs, develops, manufactures, and installs a complete custom-engineered building for biocontainment, public health, laboratory animal research, food safety, and general laboratory space requirements. www.buildingsforscience.com.

Association of Food and Drug Officials **529**
155 W Market St., 3rd Floor
York, PA 17401, USA
Phone: +1 717.757.2888
www.afdo.org

The Association of Food and Drug Officials (AFDO) promotes the uniform adoption and enforcement of food, drug, medical devices, cosmetics and product safety laws, rules, and regulations. Founded in 1896, AFDO is an international, nonprofit professional organization consisting of state, federal and local regulatory officials as members. Industry representatives are welcomed as associate members. AFDO is a mechanism for advancing regulatory program standards that will help to advance an integrated food safety system. The organization also provides training and continuing education as well as networking opportunities that foster understanding and collaboration among all members and an appreciation for each role in the food and medical device safety system.

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Phone: +1 952.936.0990
www.biolyph.com

BIOLYPH's Lyophilization Services maximize the quality and value of your Food Safety assays, calibrators, and controls by endowing them with years of room temperature stability and superior ease of use. With BIOLYPH's LyoSphere™ technology, precise aliquots of lyophilized reagents can be packaged inside virtually any device, including tube strips, plates, and custom devices. LyoSpheres™ rehydrate instantly and reduce user time, steps, and errors, eliminate cold chain dependency, and increase product quality. Detection tests produced as LyoSpheres™ include *Salmonella*, *Listeria*, *Campylobacter*, *E. coli*, STEC, *Vibrio*, *Shigella*, and more. Visit our booth to learn how BIOLYPH can add value to your products.

bioMérieux, Inc. **100**
595 Anglum Road
Hazelwood, MO 63042-2320, USA
Phone: +1 800.634.7656
www.biomerieux-usa.com

bioMérieux Industry offers a full range of Microbiology Solutions for Food and Pharmaceutical companies worldwide. Visit our booth to learn about the latest solutions for Pathogen Testing with VIDAS® and GENE-UP®; Media Prep and Sample Processing including MASTERCLAVE®, APS ONE™, DILUMAT™ and SMASHER™; Food Culture Media; Quality Indicator testing with TEMPO®; in-process control and release testing using BACTIFLOW®, D\COUNT® and BACT/ALERT®; Pathogen Identification/confirmation using VITEK® and API® Systems and CHROMID® Culture Media. Be sure to inquire about our Laboratory Services for Workflow Optimization and Temperature Monitoring with LABGUARD® 3D. bioMérieux brings confidence to the table by meeting all of your microbial analysis needs.

Biomist **629**
573 North Wolf Road
Wheeling, IL 60090, USA
Phone: +1 847.850.5530
www.biomistinc.com

Learn how to sanitize without water, rinsing or wiping! Biomist systems atomize alcohol into non-flammable aerosols that quickly clean and sanitize production facilities. The penetrating mist reaches into cracks and crevices to kill pathogens where they hide, then evaporates leaving surfaces dry and ready for use.

Perfect for dry areas, transition zones and water-sensitive equipment, customers quickly regain their investment through reduced application time, labor and chemical consumption. Compared to trigger sprayers, you get about twice the coverage per bottle.

Biomist is quickly becoming the method of choice among industry professionals, please visit our booth to learn more! www.biomistinc.com.

Bio-Rad Laboratories **427**
2000 Alfred Nobel Drive
Hercules, CA 94547, USA
Phone: +1 800.4BIO.RAD
www.bio-rad.com/foodscience

Bio-Rad Laboratories has played a leading role in the advancement of scientific discovery for over 60 years. We manufacture tests for food safety with a complete line of solutions for food pathogen testing. We offer a full menu of real-time PCR test kits for the detection of key pathogens, culture media for nutritive enrichment and RAPID chromogenic media with easy colony identification for detection of pathogens and enumeration of quality indicators. As an instrument manufacturer, Bio-Rad also provides instrument options for both low- and high-volume users, including our iQ-Check® Prep automation system.

Bioscience International, Inc. **451**
11333 Woodglen Drive
Rockville, MD 20852, USA
Phone: +1 301.231.7400
www.biosci-intl.com

The newest generation of SAS microbial air monitors for ensuring full compliance with ISO 14698, cGMP and other international monitoring guidelines will be displayed.

Bird•B•Gone **156**
15375 Barranca Pkwy.
Irvine, CA 92618, USA
Phone: +1 949.387.4555
www.birdbgone.com

Blulog US **626**
100 South Commons, Suite 102
Pittsburgh, PA 15212, USA
Phone: +1 800.240.7193
www.blulog.us

Blulog makes LIVE and on-demand wireless temperature and temperature/humidity monitoring, recording and reporting a reality. Utilizing the innovative blulog NFC and RF temperature data loggers, monitoring and recording systems are available for reefer transport, cold storage, restaurant/commissary operations, food safety labs, and more. Full history time and temperature data storage and reports are accessible through the complimentary, cloud-based BluConsole dashboard software that is accessible to all parties within the cold chain. Learn more at www.blulog.us.

BootieButler **321**
1616 Park 370 Court
Hazelwood, MO 63042, USA
Phone: +1 800.710.9863
www.bootiebutler.com

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Bruker Corporation **537**
40 Manning Road
Billerica, MA 01821, USA
Phone: +1 978.663.3660
www.bruker.com

As a leading innovator in instrumentation, Bruker Corporation provides complete solutions for food safety, authenticity and quality control. The MALDI Biotyper®, validated and certified according to the Official Method of Analysis program (OMA) of the AOAC International and to the new ISO 16140-part 6 standard by MicroVal, offers a reliable "one system – one workflow" solution for microbiology of the food chain, in terms of safety and quality. The IR Biotyper® for strain typing, enables fast quality control of technological strains and tracking of microbial contaminants prior to WGS.

With the FoodScreener™, authenticity, adulteration and quality control are performed in one single measurement in less than 30 minutes. The fully automated solution offers modules for honey, juice and wine, and fulfills the increasing need for non-targeted methods to tackle dynamic food fraud.

Bureau Veritas – BV Labs Food & Agri **116**
22201 W. Innovation Drive
Olathe, KS 66061, USA
Phone: +1 913.274.6567
www.maxxamlabs.com

BV Labs – Food and Agri is a market leader in analytical services and solutions to the agriculture, environmental, and food industries. A member of the Bureau Veritas Group of companies – a world leader in testing, inspection, and certification services. We provide unparalleled depth of technical and scientific expertise and serve customers through a national network of laboratories. BV Labs – Food and Agri skillfully combines efficiency and customer service with rigorous science and uncompromising quality management.

Cedarlane **416**
1210 Turrentine St.
Burlington, NC 27215, USA
Phone: +1 800.721.1644
www.cedarlanelabs.com

Providing today's food safety professionals with products of the highest quality, Cedarlane provides reagents from over 1,000 top global supplier brands. Products include water, dairy, wine, beer and food testing kits (toxins, chemicals, hormones, drug residues, allergens, nutritional profile, etc.), antisera and kits for bacterial serotyping, microbiological media and more! Featuring the *Salmonella* Velox and Infant3 PCR kits from DNA Diagnostic.

Certified Laboratories, Inc. **250**
65 Marcus Drive
Melville, NY 11747, USA
Phone: +1 516.576.1400
www.certified-laboratories.com

For over 90 years, Certified Laboratories, Inc. has been providing full service quality laboratory testing services for the food industry. As a state-of-the-art ISO 17025 accredited laboratory, we're proud to offer complete microbiological and chemical testing facilities in New York, Southern California, Northern California and the Midwest. Specialty areas include spice analysis, microbiology, chemistry, nutritional analysis, vitamin assays, antibiotics, extraneous matter and environmental testing, with special attention to FDA and regulatory agency requirements and microbiological reduction validation services. We use specialized analytical equipment including LC/MS-MS, GC/MS, GC/MS-MS, AA and ICP/MS. Certified Laboratories employs only recognized methods and procedures.

CERTUS **341**
4809 N Ravenswood Ave., Suite 113
Chicago, IL 60640, USA
Phone: +1 872.810.4123
www.certusfoodsafety.com

CERTUS™ delivers new tools for food-safety testing. Empowering food producers of all sizes to proactively achieve FSMA and HACCP compliance with confidence, CERTUS changes the game with simple rapid pathogen tests. Introducing patented SERS technology that combines enrichment and high sensitivity detection in a homogenous no-wash format for real-time monitoring, CERTUS provides accurate results. The CERTUS technology, applied to environmental monitoring and food testing, will eliminate complex workflow enabling any food processor to conduct safe and easy on-site testing, receive instant alerts, and take immediate action to remediate. CERTUS allows companies to get ahead of potential problems, make informed decisions and take definitive action based on accurate and timely information – at the source.

Charm Sciences, Inc. **510**
659 Andover St.
Lawrence, MA 01843-1032, USA
Phone: +1 978.687.9200
www.charm.com

Charm Sciences is a world leader in food safety diagnostics. Charm's two-pronged Sanitation Monitoring Program ensures the highest level of food safety, quality control, and audit compliance using the novaLUM® II-X ATP Detection System and Charm Peel Plate® Microbial Tests with Colony Counter. Charm offers simplified diagnostics and data management solutions to track and trend results with integration to LIMS system. Rely on Charm Sciences for excellence in quality, innovation, and sensitivity to protect your brand! Booth #510.

Check-Points B.V. **254**
Binnenhaven 5
Wageningen, 6709PD, The Netherlands
Phone: +31.317.453.908
www.checkandtrace.com

Check-Points' innovative Check&Trace *Salmonella* method can discriminate over 300 *Salmonella* serotypes, including the most relevant ones like *S.* Typhimurium, due to the differences in their DNA sequences. This allows the Check&Trace *Salmonella* test to significantly decrease serotyping lead times and enable quick tracing. The Check&Trace *Salmonella* confirms *Salmonella* presence and the serotype with a single test in one day. http://checkandtrace.com/ info@checkandtrace.com.

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2019 EXHIBITORS

Chihon Biotechnology **154**
2772 Golfview Road, Suite B
Naperville, IL 60564, USA
Phone: +1 630.670.5701
www.chihonbio.com

Founded in 2003, Chihon Biotechnology is a leading manufacturer of natural preservatives of Nisin and Natamycin, as well as other preservatives, such as Lauryl arginate ethyl ester. We offer technical support to the research and development. We also welcome the opportunities of contract manufacturing of other preservatives and food additives.

Clean Beam **434**
612 Stetson Ave.
St. Charles, IL 60174, USA
Phone: +1 630.234.6961
www.clean-beam.com

Clean Beam provides an exponentially more effective solution to footwear sanitization. Our patented DryZap! Technology™ uses Pulsed Ultra Violet (PUV) light to produce up to a 6 log reduction in bacteria, spores and mold kill at a DNA level in 3 seconds. It is dry, chemical free and very easy to maintain. Of most interest to our clients is its traceability feature to meet your control and compliance requirements. Our complete solution includes design, installation and training. This is the first of many efforts to fulfill our fundamental purpose – improving health through the elimination of pathogens.

Clear Labs **227**
3565 Haven Ave., #2
Menlo Park, CA 94025, USA
Phone: +1 650.257.3304
http://www.clearlabs.com

Clear Labs enables major brands to build stronger food safety and quality programs through advanced DNA sequencing, bioinformatics, and robotics. Clear Safety, the company's flagship product, is the only automated and intelligent NGS platform that is built for routine pathogen testing.

ClorDiSys Solutions, Inc. **213**
50 Tannery Road, Suite 1
Branchburg, NJ 08876, USA
Phone: +1 908.236.4100
www.clordisys.com

ClorDiSys Solutions, Inc. is a worldwide leader in contamination control and decontamination. ClorDiSys provides decontamination services for contamination mitigation as well as preventive control, utilizing chlorine dioxide gas to leave your facility cleaner and safer than ever before by eliminating the persistent pathogens from the hardest-to-reach areas. Portable CD gas generators are also available for the in-house decontamination of rooms, tanks, chambers, and processing areas of all sizes.

Cold Jet **155**
455 Wards Corner Road
Loveland, OH 45140, USA
Phone: +1 513.831.3211
www.coldjet.com

Cold Jet has two distinct lines of business centered around the use of dry ice. We provide environmental cleaning, surface preparation and parts finishing systems to global manufacturing industries. These systems utilize particles of dry ice as a blasting medium. Secondly, we produce systems for the production, metering and packaging of dry ice. These systems enable the consistent production of a controlled range of dry ice products for food transportation, cold chain management and dry ice cleaning. Customers are using our technology-based solutions to replace outdated processes that are inefficient and harmful to health and safety.

CompWALK **550**
7061 Deepage Drive, Suite 200
Columbia, MD 21045, USA
Phone: +1 410.718.7575
www.compwalk.com

Ensure compliance with FSMA, SQF and other food safety regulations using CompWALK. Our cloud-based web and mobile platform reduces the time to conduct food safety inspections and report findings. Manage corrective action tracking and food safety documentation with the ability to integrate with data loggers and other software systems with CompWALK. Work offline via iOS, Android and Windows 10 apps when internet is not available. Stop by our booth to learn more and start your free trial.

Corning Incorporated **438**
One Riverfront Plaza
Corning, NY 14831, USA
Phone: +1 607.329.0836
www.corning.com

Corning, a leading brand in Life Sciences Solutions, long recognized by scientists as the supplier of high quality laboratory products, presents its line of sample preparation equipment and disposable labware for quality control and microbiology, optimized for food and beverage testing. Manufactured to the most rigorous standards, Corning's beginning-to-end test solutions balance superior quality with unsurpassed value. From petri dishes to reusable PYREX® glassware, look to Corning for your microbiology testing needs.

Corvium, Inc. **648**
800 Boylston St.,16th Floor
Boston, MA 02199, USA
Phone: +1 617.393.7600
http://www.corvium.com/

Corvium is obsessed with making the world a safer place to eat. We provide organizations in the food industry with actionable intelligence to assure food safety and quality across their operations.

Food suppliers use CONTROL-PRO software to reduce food contamination risk and the negative impacts of regulatory penalties, product recalls, brand damage, and litigation. The food supply chain adopts the data and analytic functionalities to aggregate, visualize and prevent potential breaches of food safety and quality processes.

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By helping customers establish a "zero risk tolerance" imperative, Corvium delivers competitive advantage through improved top and bottom-line performance, and enhanced brand value.

Crystal Diagnostics **110**
510 Compton St.
Broomfield, CO 80020, USA
Phone: +1 720.351.4855
www.crystaldiagnostics.com

Crystal Diagnostics is a biotech company specializing in rapid food pathogen detection. Our platforms utilize liquid crystal biosensors for our detection process, which amplify the targeted signal and reduce background noise. This patented technology provides industry leading speed to result paired with unmatched accuracy. Our newest platform, the CDx AutoXpress™, is a fully automated high-throughput system capable of completing 480 tests every 8 hours. The CDx AutoXpress™ has one of the lowest costs per test in the industry. Reduce labor expense and human errors by automating your food testing. Stop by booth #110 and see the revolution in automation for yourself.

CultureMediaConcepts® **163**
970 E. Orangethorpe Ave.
Anaheim, CA 92801, USA
Phone: +1 714.773.1726
www.culturemediaconcepts.com

CultureMediaConcepts® is an independent manufacturer of culture media and reagents utilized in microbiological testing. Screening for indicator organisms, environmental monitoring, or testing for foodborne pathogens require specified culture media formulations recommended by the methodology used, the manufacturer of the testing platform, or a governing agency. We specialize in formatting culture media formulations for your specific needs. Our SampleReady® line of prepared dehydrated culture media, offers a RTU format that will eliminate steps of preparing your media and save you hours to results. Our DiluteReady® Sample Dilution Bags offer pre-measured prepared culture media in sterile sample bags for your specific testing application. And, our EnviroReady® sample collection device will give you leverage on environmental monitoring. Come by our booth and let's talk about your specific testing needs.

Decon7 Systems LLC **552**
8541 E Anderson Drive, Suite 106
Scottsdale, AZ 85255, USA
Phone: +1 480.339.2858
www.d7food.com

D7 is a proprietary blend of ordinary household substances that aggressively hunts and destroys bacteria and viruses in agricultural, live harvest, and food processing facilities. Validated by multiple third-party organizations, including USDA, D7 is a proven antimicrobial disinfectant that will enhance and maximize the effectiveness of your food safety program.

D7 is a patented, EPA-registered formula for use in a multitude of applications including, but not limited to, deep cleans, drain maintenance, and entryway sanitizing for controlling cross-contamination.

Once blended, the three-part D7 solution becomes an unrivaled antimicrobial disinfectant. Our focus markets include, but are not limited to, red meat, poultry, seafood, dairy, and fruits and vegetables. Visit us at www.decon7.com and follow the "Contact Us" link to learn more about our solutions and hear from some of the most notable industry references.

Detectamet Detectable Products Inc. **644**
5111 Glen Alden Drive
Richmond, VA 23231, USA
Phone: +1 804.303.1983
www.detectamet.com

If you're in food production, talk to us about reducing your risk of food recalls due to foreign body contamination. After inspection equipment on production lines, the next step is to use metal and X-Ray detectable products in processing areas, including pens, clipboards, mixing/handling equipment, knives, temperature probes, PPE and engineering materials. Since 2003 we've collected awards for our innovative products, helping businesses like yours avoid unnecessary foreign body contamination.

Our product range is made from a unique detectable polymer, manufactured from EU & FDA food contact approved materials, and plays an important contribution to successful FSMA & BRC compliance.

EAS Consulting Group, LLC **319**
1700 Diagonal Road
Alexandria, VA 22314, USA
Phone: +1 571.447.5500
www.easconsultinggroup.com

EAS Consulting Group, LLC is a leading provider of regulatory services to FDA regulated industries. With more than 50 years of experience assisting clients in developing regulatory strategies, implementing quality assurance programs and filing regulatory submissions, EAS is poised to assist food firms with the many requirements of food safety. From regulatory training, to the development and submission of GRAS notices, to FSMA, our team of former FDA officials and industry experts, many of whom have more than 30 years of quality and safety experience are recognized leaders in their fields and provide a unique perspective on the agency's requirements.

Ecoclear LLC **160**
P.O. Box 357
Holly Springs, GA 30142, USA
Phone: +1 404.919.9023
www.ecoclearclean.com

Ecoclear Coil Cleaning and Sanitization is the industry leader in deep cleaning and sanitizing refrigeration coils and food processing equipment. Ecoclear's fleet of commercial pressure cleaning trucks can access any facility, and our process uses a proprietary soap and an EPA, NSF D2 certified, stabilized Chlorine Dioxide product to remove biofilms and eliminate pathogens and spoilage organisms. The results are a longer shelf life and safe, quality food products. Additionally, the clean coils reduce refrigeration energy costs by up to 30%, allowing our clients to take advantage of energy rebates and see an ROI in usually 3–6 months.

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2019 EXHIBITORS

Ecolab Inc. **144**
1 Ecolab Place
St. Paul, MN 55102, USA
Phone: +1 651.250.4469
www.ecolab.com

A trusted partner at nearly three million customer locations, Ecolab (ECL) is the global leader in water, hygiene and energy technologies and services that protect people and vital resources. With annual sales of $14 billion and 48,000 associates, Ecolab delivers comprehensive solutions, data-driven insights and on-site service to promote safe food, maintain clean environments, optimize water and energy use, and improve operational efficiencies for customers in the food, healthcare, energy, hospitality and industrial markets in more than 170 countries around the world.

Emport LLC **436**
P.O. Box 40188
Pittsburgh, PA 15201, USA
Phone: +1 412.447.1888
https://emportllc.com

Emport LLC specializes in food safety and quality assurance kits that combine user-friendly design with rigorous scientific standards. Our core focus is rapid tests for detecting traces of gluten and other allergens. Kits include GlutenTox Pro, AOAC-PTM certified for detecting as little as 5 ppm gluten in foods and environments; and AlerTox Sticks, for checking foods and surfaces for trace amounts of peanut, almond, hazelnut, soy, fish, casein, egg, and more. Friendly, fast service and leading technology help us live up to our motto: More safe food, more happy people.

EMSL Analytical Inc. **138**
200 Route 130 North
Cinnaminson, NJ 08077, USA
Phone: +1 800.220.3675
www.emsl.com

EMSL Analytical's network of over 45 laboratories has been providing quality analytical services since 1981. Our food laboratory capabilities include: microbiology analysis, nutritional analysis, various food chemistry analysis, allergens, toxins, and adulteration analysis. EMSL's Food Testing Division laboratories are located conveniently across North America. Our Food Chemistry and Nutritional Analysis testing is done at our National Headquarters in Cinnaminson, NJ. Visit www.emsl.com for a list of locations, services, and accreditations.

Enviro Tech Chemical Services, Inc. **637**
500 Winmoore Way
Modesto, CA 95358, USA
Phone: +1 209.581.9576
www.envirotech.com

Enviro Tech Chemical Services, Inc. is one of the leading manufacturers of peracetic acid and bromine based biocides in the world. Enviro Tech offers a full line of EPA and FDA approved products for a variety of industries including fruit and vegetable processing, meat, poultry and seafood processing, agriculture, industrial water treatment, oil and gas, municipal wastewater treatment and other sanitizing applications. We have a wide range of solutions for many applications: Pera-Drain Foam, Doorway Entry Sanitizer Chemistry (Quat Free), RTU Peracetic Acid, Reflex (Nitric Acid/PAA), Powder Floor Treatments.

Environmental Safety Technologies **256**
1815 Brownsboro Road, Suite 200
Louisville, KY 40206, USA
Phone: +1 502.893.6080
www.estechlab.com

Founded in 1993, Environmental Safety Technologies is a full-service Industrial Hygiene firm, an AIHA Accredited Environmental Microbiological Laboratory and CDC ELITE *Legionella* laboratory. We provide industrial hygiene and laboratory services to a variety of different industries including healthcare, manufacturing, food production and commercial properties.

Eurofins Scientific **233**
2200 Rittenhouse St., Suite 175
Des Moines, IA 50321, USA
Phone: +1 515.265.1461
https://www.eurofinsus.com/food

Eurofins Scientific is the ideal partner to protect your brand. With a portfolio of over 200,000 analytical methods, Eurofins is committed to outstanding client service, high quality standards and scientific excellence. Our international group of laboratories provides a unique range of analytical testing services to the pharmaceutical, food, environmental and consumer products' industries and to governments. Our approximate 45,000 trained staff in 800 laboratories across 47 countries are prepared to provide local expertise wherever your business is located. In addition to being a trusted source for reliable laboratory services, Eurofins is a full service food safety provider.

FDA/CFSAN **249**
5001 Campus Drive
College Park, MD 20740, USA
Phone: +1 240.402.1907
www.fda.gov

The U.S. Food and Drug Administration Center for Food Safety and Applied Nutrition, in conjunction with the Agency's field staff, is responsible for promoting and protecting the public's health by ensuring that the nation's food supply is safe, sanitary, wholesome, and honestly labeled, and that cosmetic products are safe and properly labeled.

FlexXray, LLC **508**
3751 New York Ave., Suite 130
Arlington, TX 76014, USA
Phone: +1 817.453.3539
www.flexXray.com

FlexXray is the North American leader in product x-ray inspection and recovery services dedicated to serving food companies. We specialize in inspecting your product for physical contamination; from raw ingredients, to shelf-stable goods, to refrigerated fresh or frozen, we have a solution for you! We utilize custom developed medical grade x-ray technology running at slower speeds than tradition production speeds in order to detect items like metal, plastic, gasket material, rubber, glass, stone, and bone – which we can see down to 0.8 mm or smaller!

Currently, we partner with more than 1,000 customers to help salvage product instead of simply throwing it away or trying to rework it internally. We save our customers millions of dollars each year and help eliminate over 97% of food landfill waste on product we inspect.

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2019 EXHIBITORS

Food Microbiological Laboratories, Inc. **570**
10653 Progress Way
Cypress, CA 90630, USA
Phone: +1 714.657.7527
www.foodmicrolabs.com

Food testing and research services with expertise in food safety and quality. Food Microbiological Laboratories, Inc. is State of California (ELAP) and ISO 17025 accredited and home of automated data mapping, tracking and trending software, eBacMap®. Our leadership team includes Melissa Calicchia, MS, CFS, Chief Science Officer and Karilyn Gonzales, MS, CFS, Laboratory Director with over 50 years of combined experience in the industry. Our expert microbiologists specialize in helping our clientele with technical interpretation of data relative to routine quality screening, shelf life and allergen testing, making us known for exceptional client satisfaction.

Food Quality & Safety Magazine **566**
111 River St.
Hoboken, NJ 07030-5774, USA
Phone: +1 480.419.1851
www.foodqualityandsafety.com

Food Quality & Safety Magazine, a Wiley publication, is the food/beverage industry's go-to resource for expert-contributed, must-read content. Its award-winning editorial covers the latest news, technologies, trends, and issues happening from farm to fork to ensure a safe food supply. For over 25 years, its print and digital content has been delivering practical information to all levels of quality and safety decisionmakers in food processing, agriculture, distribution, food service/retail, and regulatory and research institutions.

Food Safety CTS, LLC **551**
1320 Goodyear Drive, Suite 205
El Paso, TX 79936, USA
Phone: +1 614.112.1290
www.foodsafetycts.com

Food Safety Consulting & Training Solutions, LLC (El Paso, TX & Chihuahua, Mexico) develops customized food safety and training solutions for the industry including e-learning programs (allucantrain.com). Our industry-wide recognized training programs are culturally compatible and science based. Stop by to see a demonstration our Doctum-All U Can Train e-learning food safety training service. We can customize it to your needs. It is easy to use and affordable. Food Safety CTS experts have helped companies to set up food safety programs and verify suppliers' food safety plans abroad and domestically. Let us be your food safety qualified individuals and conduct an assessment on your behalf.

Food Safety Magazine **350**
1945 W Mountain St.
Glendale, CA 91201, USA
Phone: +1 818.842.4777
www.foodsafetymagazine.com

Food Safety Magazine is a bimonthly publication serving food safety/quality professionals worldwide. Issues feature contributions from food and beverage industry leaders discussing: regulations, technologies, trends, and management strategies essential when applying science-based solutions to assure food safety and quality. Also, the popular podcast "Food Safety Matters" offering twice monthly episodes that feature news and trends, or another surprise segment, followed by a conversation with a food safety professional sharing their experiences and insights. Visit our booth or website www.foodsafetymagazine.com to begin your free subscription and learn more about Food Safety Matters.

Food Safety Net Services **127**
199 W Rhapsody
San Antonio, TX 78216, USA
Phone: +1 888.525.9788
www.fsns.com

Food Safety Net Services (FSNS), headquartered in San Antonio, Texas, is a national network of ISO 17025 accredited testing laboratories open 24/7, 365 days a year. FSNS provides expert technical resources that assist companies with implementing food safety and quality programs that deliver critical information needed to continually improve process controls. Additional services include GFSI, SQF and PAACO, approved auditing and certification capabilities.

Food Safety News **264**
14117 W. 61st St.
Shawnee, KS 66216, USA
Phone: +1 913.205.3791
www.foodsafetynews.com

Food Safety News is the only daily publication that reports exclusively on food safety issues. We are the first to talk with the most important people behind breaking news. We bring our readers the kind of old-fashioned, in-depth journalism that many people thought didn't exist anymore.

As a result, our readers trust our reporting and actively respond to the marketing messages they see in our publication. Our advertisers tell us that we are their #1 source of solid sales' leads, month after month. Talk with us now about how an ad schedule can help you increase your sales and your brand recognition.

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Food Safety Summit **560**
155 N Pfingsten Road, Suite 205
Deerfield, IL 60015, USA
Phone: +1 847.405.4000
www.foodsafetysummit.com

The Food Safety Summit is a solutions-based conference and expo designed to meet the educational and informational needs of the entire food industry including growers, processors, retailers, distributors, foodservice operators, regulators and academia. For more than 20 years, the Food Safety Summit has been the premier event, developed by the industry for the industry, where professionals learn from their peers about cutting-edge solutions to address emerging issues, become certified in the newest courses available and see the latest technological advances offered by leading vendors. Join us at the Food Safety Summit, May 4–7, 2020 at the Donald E. Stephens Convention Center in Rosemont, IL.

FoodChek Systems Inc. **463**
1414 8th St. SW, Suite 450
Calgary, AB T2R 1J6, Canada
Phone: +1 403.269.9424
www.foodcheksystems.com

FoodChek Systems Inc. specializes in developing and commercializing proprietary food safety tests focused on the rapid and accurate detection of *E. coli* O157, *Listeria* spp., *Listeria monocytogenes*, and *Salmonella* spp. for the human and pet food production chains. Actero™ Elite Enrichment Media is a groundbreaking patented formulation compatible with any pathogen testing system, offering single-step enrichment, fastest "time-to-results" and superior accuracy to competitors. Actero™ Universal Enrichment Media represents established media formulations used for standard testing protocols in today's labs. FoodChek's newly launched product is the Actero™ EZ-Media Bag that improves safety, reduces time in media preparation and is cost effective.

FoodLogiQ® **152**
2655 Meridian Pkwy.
Durham, NC 27713, USA
Phone: +1 866.492.4468
www.foodlogiq.com

FoodLogiQ® is a leading SaaS provider of food safety compliance, traceability, recall management and supply chain transparency solutions.

Our mission is to map the world's food chain, make it as safe as possible, and empower people to make informed decisions about the food they eat. We track millions of data points every day and connect thousands of food companies around the world.

Our technology enables supplier management, food safety compliance, quality incident management, recall management and whole chain traceability – all on a single platform built exclusively for the food industry.

FREMONTA Corp. **114**
466 Kato Terrace
Fremont, CA 94539, USA
Phone: +1 510.979.1979
www.fremonta.com

FREMONTA Corp. provides innovative sampling technology and is the USDA's exclusive licensing partner in bringing to market "the new gold standard of sampling" for the detection of pathogens in beef trimmings. FREMONTA's patent pending Continuous and Manual Sampling Devices facilitate batch sampling for microbial contaminates in foods, to improve sampling efficiency. FREMONTA's novel and intelligent sampling instruments include the MicroTally™ Swab, mobile Continuous Sampling Devise (mCSD™), and SmartSampler™. Stop by our booth #114 to see how these sampling methods can make your FSQA testing faster, easier, more cost effective, and more representative.

GFSI – The Consumer Goods Forum **632**
22/24 rue du Gouverneur Eboue
Issy-les Moulineaux, 92130, France
Phone: +33.1.82.00.95.88
www.mygfsi.com

The Global Food Safety Initiative (GFSI) brings together key actors of the food ecosystem to collaboratively drive continuous improvement in food safety management systems around the world. With a vision of safe food for consumers everywhere, food industry leaders created GFSI in 2000 to reduce food safety risks and inefficiencies while building trust throughout the supply chain. The GFSI community is composed of experts from the full stakeholder spectrum, across industry and international organizations to governments and academia. GFSI is powered by The Consumer Goods Forum (CGF), a global industry network working to support Better Lives Through Better Business.

GIANTmicrobes, Inc. **635**
78 Harvard Ave., Suite 300
Stamford, CT 06902, USA
Phone: +1 203.504.8060
www.giantmicrobes.com

GIANTmicrobes are public health and educational products based on foodborne illnesses such as *E. coli*, *Salmonella*, *Shigella*, *Bacillus cereus*, *Listeria* and more. We offer over 200 different plush diseases, cells, organs and germs. Public health agencies, companies, schools and other organizations use GIANTmicrobes for events, education and health campaigns. GIANTmicrobes are a unique and memorable way to inform and create awareness about safe food handling and processing. Co-branding and customization options are available.

Hamilton Company **668**
4970 Energy Way
Reno, NV 89502, USA
Phone: +1 775.858.3000
www.hamiltoncompany.com

Hamilton Company specializes in the development, manufacturing and customization of precision measurement devices, automated liquid handling workstations and sample management

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systems. Our products provide fully automated workflows that offer reliability, performance, and the flexibility to automate your assays, all with industry leading quality and service. Hamilton offers fully automated solutions for sample prep in food safety, etc. Hamilton Company has been a leading global manufacturer for more than 60 years, with headquarters in Reno, Nevada; Franklin, Massachusetts; and Bonaduz, Switzerland; and subsidiary offices throughout the world.

Hardy Diagnostics **119**
1430 W McCoy Lane
Santa Maria, CA 93455, USA
Phone: +1 800.266.2222
www.hardydiagnostics.com

Hardy Diagnostics has been in business since 1980 and is 100% employee owned. The company is ISO 13485 certified and manufactures over 2,700 products for microbiological testing. With over 9,000 laboratory customers across a broad spectrum of markets, Hardy Diagnostics understands the microbiological needs of the food testing industry and offers an extensive product portfolio for sample collection and preparation, microbial identification, HACCP compliance, and environmental monitoring. Hardy Diagnostics is uniquely qualified to assist the food processor in achieving its quality goals.

Hettich Instruments **549**
100 Cummings Center, 136L
Beverly, MA 01915, USA
Phone: +1 978.232.3957
http://www.hettweb.com

Hettich is an industry-leading laboratory equipment manufacturer. We design, engineer and manufacture precision equipment for the modern day laboratory. Known for our vast array of centrifugation products and laboratory incubators, Hettich delivers on quality, safety and reliability. Our engineering and manufacturing capabilities are showcased in both our standard and customized product solutions. We focus on our customers, their requirements and environmental responsibility. Hettich, proven for more than 100 years.

HiMedia Laboratories Pvt. Ltd. **214**
A-516 Swastik Disha Business Park,
via Vadhani Industrial Estate
Mumbai, Maharashtr 400 086, India
Phone: +1 484.734.4401
www.himedialabs.com

Founded 40 years ago, HiMedia, a leader in Bacteriological Culture Media formulations, now spans over 130 countries. Comprehensive identification kits for various food spoilage organisms as well as conventional and animal-free culture media are part of the HiMedia repertoire. Conforming to WHO-GMP standards and ISO-updated protocols, HiMedia's world class facilities bring to you reliable products. Our tech-service team is available to assist you wherever you are, to match our products to your precise needs. Products available in North America from HiMedia Laboratories LLC, infous@himedialabs.com, www.himediastore.com.

Hygiena **109**
941 Avenida Ave.
Camarillo, CA 93012, USA
Phone: +1 805.388.8007
www.hygiena.com

Hygiena provides rapid microbial detection, monitoring, and identification systems to improve food safety globally. Hygiena's EnSURE™ Monitoring System collects, analyzes, and reports data from multiple quality indicators, including ATP, and indicator organisms. GlutenTox® and AlerTox® products identify allergens in food products and environmental surfaces. Hygiena's BAX® System, uses PCR technology to identify pathogens in food ingredients, finished products and the environment. The Innovate System provides product quality control data for UHT processed and aseptically filled products, ensuring long shelf life. The RiboPrinter® System is an automated genetic-based system that identifies and characterizes bacteria. Hygiena is committed to the mission of providing customers with high-quality, reliable, and innovative technologies backed by excellent customer service and support. For more information visit hygiena.com/foodsafety.

ICFMH (IVZW International Committee on Food Microbiology and Hygiene) **168**
Ghent University, Faculty of Bioscience Engineering
Dept. of Food Technology, Food Safety and Health,
Coupure links 653
Ghent, 9000, Belgium
Phone: +34.660.150.807
www.icfmh.org

Since 1953 the ICFMH represents the IUMS in all issues related to food microbiology. Its major aim is to contribute to food safety internationally with activities such as the "FoodMicro" Conference, workshops, publications (*International Journal of Food Microbiology*), mobility grants and awards for young scientists, and by supporting and initiating education and training in food microbiology. The ICFMH particularly focuses on developing countries.

The 27th International ICFMH Conference, FoodMicro 2020, will take place in Athens (Greece), 7–10 September 2020, with the theme "Next Generation Challenges in Food Microbiology" (http://foodmicro2020.com/). We shall be pleased to welcome you there!

IEH Laboratories & Consulting Group **355**
15300 Bothell Way NE
Lake Forest Park, WA 98155, USA
Phone: +1 206.522.5432
www.iehinc.com

IEH delivers comprehensive support services, encompassing all aspects of microbiology and chemistry analysis, process validation, food safety plans, and recall/outbreak assistance. Our network of over 100 ISO/IEC-17025-accredited laboratories provide expedited services to addresses quality and safety concerns.

In addition, through our family of brands; Microbiologique, Roka Bio and Sample6, IEH provides options for pathogen testing, indicators, allergens, mycotoxins, meat speciation, spoilage organisms, sampling supplies, laboratory disposables, media and instruments.

We validate client's products at no charge for regulatory compliance. Come learn about how we assist with risk management and service clients with internationally recognized experts in food safety.

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IFC **317**
13420 West 99th St.
Lenexa, KS 66215, USA
Phone: +1 913.782.7600
www.indfumco.com

IFC is a national provider of pest management and sanitation solutions exclusive to the food industry. The knowledge and expertise we have gained comes from working directly with the food and commodity industries since 1937. IFC has developed a market-leading reputation for providing consistent, reliable and high quality service to our clients. We maintain this reputation by focusing our efforts on sustaining the highest standards of quality, safety, honesty and integrity in all areas of our business.

Illumina **220**
5200 Illumina Way
San Diego, CA 92122, USA
Phone: +1 858.882.3630
www.illumina.com

Illumina is improving human health by unlocking the power of the genome. Our focus on innovation has established us as the global leader in DNA sequencing and array-based technologies, serving customers in the research, clinical and applied markets. Our products are used for applications in the life sciences, oncology, reproductive health, agriculture, microbiology and other emerging segments. To learn more, visit www.illumina.com and follow @illumina.

Indoor Biotechnologies, Inc. **460**
700 Harris St.
Charlottesville, VA 22903, USA
Phone: +1 434.984.2304
www.inbio.com

Indoor Biotechnologies specializes in allergens and immunoassay products/services for the food industry, indoor air quality and biopharmaceutical industries, academic and government researchers, and Fortune 500 companies. Our mission is to improve patient care through research, education and developing cutting-edge technologies that serve our customers worldwide.

Indoor Biotechnologies' Molecular Diagnostics for Food Allergen Detection is the first immunoassay technology that allows the detection of clinically important food allergens. Molecular food allergen detection provides food manufacturers with a more comprehensive tool for safety testing that for the first time truly measures specific allergens including peanut, hazelnut, cashew, egg, shrimp, soy and milk.

InnovaPrep **211**
132 East Main St., #68
Drexel, MO 64742-0068, USA
Phone: +1 816.619.3375
www.innovaprep.com

InnovaPrep provides air, surface and liquid biomonitoring tools to help dramatically improve limit of detection for contamination monitoring in food production facilities. Sample-to-answer can be achieved in a single shift when paired with rapid molecular analysis methods for a faster, easier and better monitoring program. InnovaPrep's Concentrating Pipette Select™ provides rapid concentration of pathogens, spoilage organisms, and particulate contamination from liquid food samples and beverages. Please visit our booth for a demonstration.

International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864, USA
Phone: +1 800.369.6337
www.foodprotection.org

IAFP is an international Member-based association focused on protecting the global food supply. Membership benefits include free access to the *IAFP Report* and *Food Protection Trends* Online. Network with 4,300+ Members around the world through our Online Membership Directory, plus receive special registration rates to attend leading global food safety meetings. IAFP also publishes the *Journal of Food Protection*, internationally recognized as the leading publication in food microbiology. Visit our booth for more information.

International Association for Food Protection — Student PDG
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864, USA
Phone: +1 800.369.6337
www.foodprotection.org

Welcome, students, to IAFP 2019! If you wish to take control of your career and enrich your IAFP experience by interacting with other students and networking with professionals, get involved with the IAFP Student Group. We are an organization of undergraduate and graduate students who wish to enhance food safety through active participation in IAFP. Stop by our booth to meet your colleagues, exchange ideas, and become involved in future student group activities.

International Food & Meat Topics **218**
P.O. Box 40188
Driffield, East Yorkshire YO25 9DJ, United Kingdom
Phone: +44.013.7724.1724
www.positiveaction.co.uk

International Food & Meat Topics is a global magazine that focuses on all aspects of food and meat safety in production and processing. It carries regular features on laboratory testing and relevant research. Its editorial covers subjects as diverse as *Campylobacter*, HACCP, food safety, labelling and shelf life, and foreign body detection. Its targeted readership is QA/QC managers in food and meat production and processing plants, food testing laboratories, and responsible food safety professionals.

Interscience Laboratories Inc. **126**
32 Cummings Park
Woburn, MA 01801, USA
Phone: +1 781.937.0007
www.interscience.com

Interscience designs and manufactures an innovative product line to perform quick and safe microbiological analyses, from sample preparation to bacterial enumeration. Interscience is proud to present its latest innovation at IAFP. ScanStation® is a real-time incubator and colony counting station: a revolution for analyses in microbiological labs!

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Johns Hopkins University Center for Biotechnology Education **149**
9601 Medical Center Drive
Rockville, MD 20850, USA
Phone: +1 410.516.7769
https://advanced.jhu.edu/academics/graduate-degree-programs/food-safety-regulation/

The Johns Hopkins University Master of Science in Food Safety Regulation is offered entirely online and designed to provide students with an understanding of the legal and regulatory complexities of food production, labeling, and distribution. The program provides students with the knowledge required for companies and organizations that grow, process, distribute, or sell foods and beverages while complying with federal and state regulatory statutes for the production, distribution, and commercialization of food products. Students need to complete 10 graduate-level courses online within a five-year timeline.

LexaGene **375**
500 Cummings Center, Suite 4550
Beverly, MA 01915, USA
Phone: +1 800.215.1824
www.lexagene.com

LexaGene is developing an easy-to-use PCR-based analyzer for the food industry. It is designed to shorten the time to a confirmed negative result for products held under the 'Test and Hold Policy'. The technology is expected to be particularly beneficial for detecting slower growing organisms like *Listeria*. The shortened time is achieved by utilizing an automated instrument to process larger volumes of enriched broth – followed by highly sensitive PCR to screen for the most common food pathogens (*E. coli, Salmonella*, *Listeria,* and more). Such a quick turnaround time will provide food safety officers with the necessary information to determine whether their products can be safely shipped or if tainted, to take corrective action.

Log10®, LLC **462**
2402 Sykes Blvd.
Ponca City, OK 74601, USA
Phone: +1 580.304.7953
www.log10.com

Log10®, LLC is a comprehensive food safety company, supporting the food industry with services ensuring safety and quality of food. We focus on common food pathogens and competing probiotics that prevent or eliminate these hazards. Log10® manufactures customized Pre-Liminate™ probiotic formulations proven to eliminate pathogens from food and environmental surfaces.

Professional consulting services that are provided include: FMSA preparedness, GAP analyses, HACCP training, preventive controls for animal food (PCQI training), among others. Log10® offers ISO 17025 accredited laboratory services including microbiological testing and customized research studies. We partner with clients to ensure manufacturing of safe, high-quality food products.

MadgeTech **633**
6 Warner Road
Warner, NH 03278, USA
Phone: +1 603.456.2011
www.madgetech.com

From cooking and cooling to shipping and storage, ensure food quality while protecting your bottom line. MadgeTech data loggers are essential to any HACCP plan — keeping auditors happy, customers healthy and business profitable. Real-time monitoring, alarms and notifications give users the power to manage critical control points before deviation occurs. Maintaining records is a breeze, MadgeTech 4 Software automatically generates reports for compliance and analysis.

Matrix Sciences **308**
1061 Feehanville Drive
Mount Prospect, IL 60056, USA
Phone: +1 847.272.8700
www.matrixsciences.com

Matrix Sciences delivers accurate, timely and insightful information so that customers have what they need to bring safe, quality food to market.

Matrix partners with customers offering a market-leading combination of services and technology to provide the support, expertise and resources food manufacturers need to make informed decisions with confidence.

MediaBox by Microbiology International **433**
5350 Partners Court
Frederick, MD 21703, USA
Phone: +1 301.662.6835
www.800ezmicro.com

Microbiology International will be demonstrating MediaBox™ Sterile Liquid Solutions, our revolutionary new product for ready-to-use liquid culture media. MediaBox™ Sterile Liquids are easy to use and store, conveniently packaged in a stackable box. Available in BPW, mTSB, modified UVM, sterile water, Butterfields, lactose broth, and more. Custom formulations upon request! MediaBox™ Sterile Liquids connect directly to the EZ-Flow gravimetric diluters or EZ-Dispense peristaltic pump for a completely closed system during sample preparation. Stop by our booth for a demonstration and make your lab's sample prep EZ!

Meridian Bird Removal **466**
17 N Franklin St.
Christiansburg, VA 24073, USA
Phone: +1 855.362.2200
www.meridianbirdremoval.com

Meridian Bird Removal solves nuisance bird problems for businesses by removing birds in a fast, effective and safe manner. Meridian's Bird Removal Technicians deploy patented capture gear and a proven process unlike anything else on the market.

Based in Christiansburg, Virginia, Meridian began in 2010 as a general wildlife control company. The company soon saw the opportunity in the market for solving nuisance bird problems but also the frustration customers had with them. Meridian began to focus exclusively on birds and the business started to grow more rapidly. We now solve nuisance bird issues for businesses in more than thirty states.

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Mérieux NutriSciences **219**
111 E Upper Wacker Drive, 23rd Floor
Chicago, IL 60601, USA
Phone: +1 312.938.5151
https://www.merieuxnutrisciences.com/us/

Mérieux NutriSciences is a leading global food safety and quality partner — offering chemistry and microbiology testing, labeling, auditing, consulting, sensory testing, customized training, research services, and digital solutions to the food and nutrition industry. Focused on customer excellence, we protect consumers' health through nutritional research, scientific excellence, and innovation. We customize our services to meet the needs of individual manufacturers, food processors, caterers, restaurants, and retailers. Headquartered in Chicago, Mérieux NutriSciences has grown from a single laboratory to have a global presence. Present in 24 countries, Mérieux NutriSciences employs 7,000 people worldwide working in just over 100 laboratories.

Merq Automation **209**
5-263 Barton St.
Stoney Creek, ON L8E 2K4, Canada
Phone: +1 647.998.4356
www.merqautomation.com

Merq is a laboratory automation and solutions provider. Lab equipment design and automation are our primary focus but we also support with custom tooling, fixtures, repairs, service, floor plans, building design and process improvement.

METER Group, Inc. USA **445**
2365 NE Hopkins Court
Pullman, WA 99163, USA
Phone: +1 509.332.2756
www.metergroup.com

Demo AQUALAB AQ2, the smart water activity meter. Use SKALA Freemium to see your water activity data in real time. Premium options let you connect other lab instruments and sources of data and collect all your information in one place—no writing, no typing, no data entry. Stop by the booth to see how much food manufacturers are saving by using SKALA's moisture optimization and digital overpack solutions without any significant equipment upgrades.

Michelson Laboratories **158**
6280 Chalet Drive
Commerce, CA 90040, USA
Phone: +1 562.928.0553
www.michelsonlab.com

Since 1970, Michelson Laboratories has provided complete chemical and microbiological analyses to the food and environmental industries throughout the country. We are an ISO/IEC 17025 Accredited Laboratory offering rapid turnaround time, accurate, reliable results and excellent customer service. We specialize in a number of methodologies for indicator organism and pathogen analysis, including PCR, as well as shelf life and challenge studies. Our chemistry lab offers antibiotic residue and melamine testing by LC/MS in addition to nutritional labeling, pesticide analysis, heavy metals by ICP/MS, GMO, Hepatitis A testing and more.

Michigan State University Online Food Safety Program **140**
1129 Farm Lane, Rm B-51
Food Safety & Toxicology Building
East Lansing, MI 48824, USA
Phone: +1 517.884.2078
http://foodsafety.msu.ed

Michigan State University's Online Food Safety program strives to educate professionals on how to make global food systems safe and supports individuals as they advance in food safety-related careers. The program consists of an online Master of Science in Food Safety degree, non-credit continuing education courses and an on-campus executive education program. Be more effective, efficient, and confident in an ever-changing workplace. Who will keep food safe? Spartans Will.

Micro Essential Laboratory **335**
4224 Ave. H
Brooklyn, NY 11210-0824, USA
Phone: +1 718.338.3618
www.microessentiallab.com

Our company has been a market leader in pH and sanitizer testing technologies, serving the food service industry since 1934. Customer service and product quality are the company focus, and critical factors for success. Our goal is to develop lasting relationships.

Microbac Laboratories, Inc. **159**
One Allegheny Square, Suite 400
Pittsburgh, PA 15212, USA
Phone: +1 412.459.1060
www.microbac.com

Your success is our success, and that's why customers from across industries come to us for testing solutions that deliver quality measurement, data and powerful insights that they can trust. As one of the largest family-owned laboratories in the nation, we pride ourselves on humble beginnings and impressive impact. For nearly 50 years our network of laboratories have offered complete ISO-accredited testing solutions in food, life sciences and environmental by seeking relationships over transactions and the long over the short. Now, we continue to uphold our clients success as our number one priority and improve the world around us one test at a time. What can we do, for you?

Microbiologics **627**
200 Cooper Ave. N
St. Cloud, MN 56303, USA
Phone: +1 320.253.7400
www.microbiologics.com

Microbiologics is the leading provider of ready-to-use QC microorganisms for quality control testing in food laboratories. With over 900 strains available, we offer the largest and most diverse line of QC microorganisms including qualitative, quantitative, CRM, inactivated pathogens, synthetic molecular standards, and more. Visit booth 627 to learn how our QC microorganism products can save your laboratory time and money.

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Microbiology International **332**
5350 Partners Court
Frederick, MD 21703, USA
Phone: +1 301.662.6835
www.800ezmicro.com

Microbiology International will be exhibiting everything your lab needs for air sampling, in-house media preparation, sample preparation, enumeration, confirmation and destruction. Stop by our booth for demonstrations of our air sampler, spiral plater, colony counter, media preparators/plate pourers, laboratory autoclaves, innovative sample preparation instruments and a comprehensive line of rapid bacterial screening and identification kits for common food pathogens. We can help make your lab processes EZ!

Midland Scientific, Inc. **258**
10651 Chandler Road, Suite 102
La Vista, NE 68128, USA
Phone: +1 800.642.5263
www.midlandsci.com

Midland Scientific is a full-line distributor of laboratory supplies including chemicals, equipment, and consumables. Our customer service and distribution centers, along with our sales force, span the entire United States to ensure timely delivery of your products. We pride ourselves in offering superior service to the customer through a helpful and friendly staff, quality products, competitive pricing, and extensive product options.

MilliporeSigma **555**
400 Summit Road
Burlington, MA 01803, USA
Phone: +1 800.645.5476
www.milliporesigma.com

MilliporeSigma is the U.S. life science business of Merck KGaA, Darmstadt, Germany. With 19,000 employees and 72 manufacturing sites worldwide, MilliporeSigma's portfolio spans more than 300,000 products enabling scientific discovery. MilliporeSigma has customers in life science companies, university and government institutions, hospitals and industry. More than 1 million scientists and technologists use its products. The company is committed to solving the toughest problems in life science by collaborating with the global scientific community.

MP Biomedicals, LLC **371**
29525 Fountain Pkwy.
Solon, OH 44139, USA
Phone: +1 440.337.1200
www.mpbio.com

MP Biomedicals sells and manufactures products in ISO-certified and FDA-approved facilities worldwide. MP Biomedicals is featuring SafTest Systems and Kits, the best instruments and kits for your food. The SafTest Oil Platform has the ability to be customized to run all or any combination of the SafTest Endpoints such as peroxide value, free fatty acids and malonaldehydes. We serve researchers worldwide with innovative tools meeting their needs with unparalleled service.

National Environmental Health Association **348**
720 S Colorado Blvd., Suite 1000-N
Denver, CO 80246, USA
Phone: +1 303.756.9090
www.neha.org

The mission of the National Environmental Health Association (NEHA) is to "advance the environmental health professional for the purpose of providing a healthful environment for all." NEHA represents 5,000 members from the U.S. and abroad who work at federal/state/local agencies, academia, industry, and the armed forces. NEHA offers credentialing, education, and resources related to the broad spectrum of environmental health topics including air quality, food safety, hazardous materials, preparedness, sustainability, vector control, and water quality.

National Registry of Food Safety Professionals **631**
6751 Forum Drive, Suite 220
Orlando, FL 32821, USA
Phone: +1 800.446.0257
www.nrfsp.com

National Registry of Food Safety Professionals (NRFSP) offers comprehensive certification programs for managers, in both food safety and HACCP, including retail-focused food safety exams for grocery and c-store operators. ANSI and ISO accredited, NRFSP provides many options for the training and certification of managers and certificate programs for food handlers, as well as diagnostic reporting and tracking of data. Learn more at www.nrfsp.com or call 1.800.446.0257.

Nelson-Jameson, Inc. **410**
2400 E 5th St.
Marshfield, WI 54449, USA
Phone: +1 800.826.8302
www.nelsonjameson.com

Since 1947, Nelson-Jameson has been a trusted source of food processing supplies. We represent over 850 vendors and distribute over 50,000 products in the broad categories of: Processing & Flow Control, Safety, Sanitation & Janitorial, Production & Material Handling, Building & Facility Maintenance, Laboratory & QA/QC, and Packaging & Ingredients. Our products are backed by expert staff who can provide you with the direction you need when choosing safe, quality products for your processing plant.

Nemis Technologies AG **569**
Ueberlandstrasse 109
Duebendorf, Zurich 8600, Switzerland
Phone: +44.44.820.71.52
www.nemistech.com

Founded in 2018, Nemis Technologies AG is a Swiss diagnostics company in the field of rapid, precise, easy-to-use and low-cost screening and detection of pathogenic bacteria. Its AquaSpark™ technology has proven to deliver a significant reduction in time-to-results for various bacteria over current market standard, thus providing a very powerful technology to prevent proliferation and dissemination of dangerous microorganisms at a large scale.

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Neogen **141**
620 Lesher Place
Lansing, MI 48912, USA
Phone: +1 800.234.5333
www.foodsafety.neogen.com

Neogen's comprehensive line of rapid food safety products includes DNA-definitive tests for *Salmonella*, *Listeria*, *Listeria monocytogenes* and *E. coli* O157:H7; *Listeria* Right Now™ detects the pathogen in less than 60 minutes — without enrichment; simple and accurate tests for food allergens, including milk, egg and peanut; dairy antibiotics, including the BetaStar® receptor-based lateral flow assay for the rapid detection of beta-lactam residuals in milk; spoilage organisms (e.g., yeast and mold); mycotoxins; Neogen Culture Media; and sanitation, including the AccuPoint® Advanced ATP system.

Nestlé Quality Assurance Center (NQAC) Dublin **165**
6625 Eiterman Road
Dublin, OH 43017, USA
Phone: +1 614.526.5345
www.nqacdublin.com

Nestlé Quality Assurance Center (NQAC) Dublin, an ISO 17025 Accredited Laboratory since 1998, analyzes food and beverage products to verify compliance with regulatory, food safety and quality standards. Our state-of-the-art facility offers over 150 unique methods analyzing raw ingredients, finished food, environmental and beverage products to support your testing needs. Capabilities include: Nutritional Labeling, Chemistry Analysis, Microbiology Analysis, Challenge and Shelf-Life Studies, Microwave Cooking Instructions Validation, Environmental Monitoring Services, Foreign Body Investigations, Allergens and GMO, Packaging Analysis and more.

Neutec Group Inc. **453**
1 Lenox Ave.
Farmingdale, NY 11735, USA
Phone: +1 516.870.0877
www.neutecgroup.com

Neutec Group is a market leader in implementation of innovative technologies for QC and R&D laboratories. At the IAFP Annual Meeting, we will highlight our equipment solutions for measuring Water Activity (a_w), Microbiology testing and analysis of features such as color, shape, size and coating through Multi Spectral imaging techniques.

Novolyze **267**
50 rue de Dijon
Daix, 21121, France
Phone: +33.9.83.69.42.13
www.novolyze.com

Novolyze is a food safety company. Our mission is to develop and commercialize innovative technologies to help the food industry manufacture safer food, while ensuring strong compliance with international food safety and quality standards. Our innovative approach to Food Safety relies on the utilization of cutting-edge microbiology solutions, combined with the latest developments in digital, IoT and machine learning.

Our solutions: SurroNov®, the first range of ready-to-use surrogate organisms. They are used directly at the factory to test the efficacy of processing systems.

FoodSafetyGuardian® is the first connected solution fully devoted to the control of microbial intervention steps. Visit www.novolyze.com.

NSF International **409**
789 N Dixboro Road
Ann Arbor, MI 48105, USA
Phone: +1 734.769.8010
www.nsf.org

NSF International has 70+ years of experience helping companies navigate the complex food safety, quality and regulatory environment across the entire food supply chain. This includes NSF's brand protection services for retail and foodservice operations offering auditing, consulting and technical services to help you ensure food safety and quality. In addition, we have the NSF Applied Research Center, this R&D arm of NSF offers customized testing solutions to companies and researchers. At the core we all work toward the NSF mission of furthering public health. For more information, visit www.nsf.org.

NSI Lab Solutions **245**
7212 ACC Blvd.
Raleigh, NC 27617, USA
Phone: +1 800.234.7837
www.nsilabsolutions.com

Manufacturer of Certified Reference Materials: Microbe Cocktails for Indicators, Pathogens and Food Matrix Microbiology CRMs. NSI Lab Solutions is an accredited PT provider too! Acc-redited to ISO Guide 34, ISO Guide 17025, ISO 9001, and ISO Guide 17043. www.nsilabsolutions.com. +1 800.234.7837.

Orkin **151**
2170 Piedmont Road NE
Atlanta, GA 30324, USA
Phone: +1 404.287.8074
www.orkin.com/commercial/

Orkin Food Safety Precision Protection®: Pest control down to a science®. Orkin's Food Safety Precision Protection® program is designed specifically for the highly regulated food processing industry. It comes complete with Orkin Gold Medal QA®, a system of comprehensive documentation and audit support anytime you need it. To learn more or to request a free consultation, call 1.800. ORKIN NOW or visit us at www.orkincommercial.com.

Oxford Nanopore Technologies, Ltd. **533**
Gosling Building, Edmund Halley Road
Oxford Science Park
Oxford, Oxfordshire OX4 4DQ, United Kingdom
Phone: +44 0.845.034.7900
www.nanoporetech.com

Oxford Nanopore Technologies has developed the world's first nanopore DNA and RNA sequencing devices, scalable to your requirements. The MinION is a portable, real-time, long-read, low-cost device designed to bring simple biological analyses to anyone, whether in scientific research, education or real-world

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applications, from outbreak surveillance and environmental monitoring to population genomics and microgravity biology. The GridION and PromethION devices serve users with larger projects or more samples. Oxford Nanopore Technologies products are currently for Research Use Only. Not for use in diagnostic procedures.

Ozone Partner US **655**
5313 Serene Hills Drive, #1406
Austin, TX 78738, USA
Phone: +1 512.781.4035
www.ozonepartner.com

Latest breakthrough in food Disinfection and Sterilization! Our patented ExOzone brand technology can transform ambient-air into super-high concentration of ozone gas, at industrial scale, sterilizing all surfaces and air, then quickly break back down to ambient-air (O_2) leaving NO toxic residuals. Chemical-Free, Sustainable, No-Consumables, No-Downtime, Economic, OSHA-Safe, Portable and the most effective oxidant on the market. EPA registered, FDA approved, GRAS.

Pall Corporation **261**
25 Harbor Park Drive
Port Washington, NY 11050, USA
Phone: +1 866.905.7255
www.pall.com/foodandbev

Pall Corporation is a global filtration, separation and purification leader providing solutions to meet the critical fluid management needs of customers across the broad spectrum of life sciences and industry. We work with our customers to advance health, safety and environmentally responsible technologies.

Pall Food and Beverage provides products and services to ensure product quality and maintain process reliability in beverage and food production. Our solutions also assist in consumer protection, the reduction of operating costs and waste minimization.

Partnership for Food Safety Education **659**
2345 Crystal Drive, Suite 800
Arlington, VA 22202-4813, USA
Phone: +1 202.220.0651
www.fightbac.org

The non-profit Partnership for Food Safety Education works to reduce foodborne illness risk through consumer food safety education and by supporting health and food safety educators nationwide with the tools and educational programs they need to be effective at changing food handling behaviors in the home. www.fightbac.org.

Passport Food Safety Solutions **247**
6935 Vista Drive
West Des Moines, IA 50266, USA
Phone: +1 515.334.8035
www.passportfoodsafety.com

Passport Food Safety Solutions, a division of Arm & Hammer Animal & Food Production, delivers the most comprehensive portfolio of pre- and post-harvest solutions. We deliver practical food safety solutions through a broad portfolio of technologies, predictive analytics and consultation, and a commitment to developing new innovations that meet the food safety needs of all sectors of the industry.

PolySkope Labs **667**
755 Research Pkwy., Suite 460
Oklahoma City, OK 73104, USA
Phone: +1 805.443.0725
www.polyskopelabs.com

PolySkope Labs was founded in 2011 by pioneers in molecular diagnostics to develop next-generation multiplex solutions for food safety testing. The Company achieved AOAC approval of the world's first comprehensive multiplex detection method for the simultaneous detection of all major bacterial pathogens that cause illnesses in Food, Beverage, and Cannabis. This revolutionary advancement in pathogen detection provides flexibility, workflow simplification, and >60% reductions in the cost-of-analysis for food safety and cannabis labs.

PrimusLabs **630**
2810 Industrial Pkwy.
Santa Maria, CA 93455, USA
Phone: +1 805.922.0055
www.primuslabs.com

For over 30 years, Primus Group has remained the single point of contact in food safety for microbiological and pesticide residue testing, data management/analytics, consulting, and audit scheme ownership. PrimusLabs utilizes state-of-the-art technology, degreed technical staff, and QA oversight to raise your results to an actionable level. Azzule Systems offers data management solutions through the Azzule Supply Chain Program (SCP). By blending audit and laboratory data with analytics, the SCP's tools enhance the buyer's confidence in their suppliers and overall food safety program. Turn to PrimusLabs and Azzule for all your FSMA compliance and food safety needs.

Procter & Gamble Professional **273**
2 P&G Plaza
Cincinnati, OH 45202, USA
Phone: +1 803.447.5616
www.pgpro.com

P&G Professional is the away-from-home division of Procter & Gamble, serving the foodservice industry a safe, simple, and effective foodservice solution including a comprehensive portfolio of dish machine chemicals and dish machines – Offering a total food safety solution – Also serving building cleaning and maintenance, healthcare, hospitality, and grocery/retail industries. P&G Professional offers complete solutions utilizing its parent company's scale, with trusted brands such as Dawn® Professional, Mr. Clean® Professional, Tide® Professional, Swiffer® Professional, Comet®, Spic and Span®, Febreze®, and P&G Pro Line®. www.pgpro.com.

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Promega Corporation **467**
2800 Woods Hollow Road
Madison, WI 53711, USA
Phone: +1 608.274.4330
www.promega.com

As a world leader in applying genomics and cellular biology expertise to develop high value products for the Life Sciences, Promega Corporation understands that today's food quality, GMO and authenticity testing challenges require creative solutions. We have developed systems that simplify plant and food DNA extraction and seamlessly integrate into food testing workflows. Stop by our booth to learn more about successful approaches and tools for enabling GMO and food pathogen testing.

PURE Bioscience, Inc. **120**
1725 Gillespie Way
El Cajaon, CA 92020, USA
Phone: +1 314.308.2961
www.purebio.com

PURE Bioscience, Inc. is focused on developing and commercializing our proprietary antimicrobial products that provide solutions to the health and environmental challenges of pathogen and hygienic control. Our technology platform is based on patented, stabilized ionic silver, and our initial products contain Silver Dihydrogen Citrate (SDC). SDC is a broad-spectrum, non-toxic antimicrobial agent that is manufactured as a liquid and delivered in various concentrations. We currently manufacture and distribute SDC-based disinfecting and sanitizing products, which are registered by the United States Environmental Protection Agency (EPA). We intend to focus our current resources on providing food safety solutions to the food industry.

PureLine **326**
1241 N Ellis St.
Bensenville, IL 60106, USA
Phone: +1 847.732.7253
www.pureline.com

Need a clean break? Have you tried chlorine dioxide or been quoted a price for a treatment and thought it was too expensive? PureLine prides itself on offering a full-line of chlorine dioxide products and services at a cost-effective model that guarantees a 6-log kill! For over 20 years PureLine has been providing both gas and liquid chlorine dioxide sanitation solutions that are customized to their customers' needs.

Puritan Medical Products Company, LLC **628**
31 School St., P.O. Box 149
Guilford, ME 04443, USA
Phone: +1 207.876.3311
www.puritanmedproducts.com

Puritan Medical Products Co., LLC is known worldwide as a trusted manufacturer of environmental sampling swabs and collection devices for your ideal application. Choose from handle, tip, and fill options that give you instant results, perfect for spot checks of virtually any surface. Whether you're testing meat for pathogens or trying to determine the effectiveness of a cleaning program, you can count on us for the highest quality products to get the job done.

Q Laboratories **118**
1930 Radcliff Drive
Cincinnati, OH 45204, USA
Phone: +1 513.471.1300
www.qlaboratories.com

Q Laboratories has served the food and beverage industries since 1966, offering exceptional microbiology and chemistry laboratory, and research and development services. An ISO/IEC 17025 Accredited, GMP/GLP compliant laboratory, Q Laboratories can provide services to meet all your testing and quality assurance needs. Capabilities include: pathogen detection, microbial identification (MALDI-TOF), nutritional analysis, allergen screening, challenge studies, shelf-life studies, environmental monitoring programs, and method validation/verification studies to help test kit manufacturers demonstrate proficiency of proprietary methods. Q Laboratories is the first North America-based laboratory to be approved as an AOAC Independent Laboratory, an AFNOR Expert Lab, and a MicroVal Expert Laboratory.

QA Line, LLC **534**
9369 W Pandion Court
Boise, ID 83714, USA
Phone: +1 559.217.8909
www.qaline.net

QA Line, LLC specializes in Microbiology and Chemistry lab efficiency, lab design, development, equipment, supplies and consumables. We have built labs from 400–20,000+ sq ft for a wide variety of food producers and reference labs. QA Line, LLC is unique in our ability to improve lab efficiency through design, lab development, construction, custom equipment, unique media solutions, lab procedures, and ISO 17025 preparation. Talk to us about how we can save you significant $$ while improving your QA data by building/utilizing your in-house lab. Come by for a free ROI on your current lab usage compared to in-house lab costs.

QSI **356**
412 Georgia Ave., Suite 300
Chattanooga, TN 37403, USA
Phone: +1 800.321.1412
www.vincitgroup.com

QSI is the premier contract sanitation option for food processing in America. Our Human Safety and Food Safety divisions are continually innovating, discovering new ways to sanitize our clients' facilities effectively and efficiently.

For us, Food Protection isn't of secondary concern—it's our business model. We thrive on an ethic of excellence, offering every partner the assurance that every unit is in the best it can be. With QSI, your customers and brand have never been safer.

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QualiTru Sampling Systems **251**
471 Hayward Ave. North
Oakdale, MN 55128, USA
Phone: +1 651.501.2337
www.qualitru.com

QualiTru Sampling Systems is a trusted brand when it comes to aseptic sampling of your most critical fluid products. We have an ongoing commitment to the industry by providing an accurate sampling system for all your fluid sampling needs. Our patented products and processes allow for multiple sterile sampling channels into sterile sampling containers, thus eliminating the risk of sampling contamination and ensures the most accurate sampling techniques on the market today.

Quality Assurance & Food Safety Magazine **216**
5811 Canal Road
Valley View, OH 44125, USA
Phone: +1 216.393.0300
www.qualityassurancemag.com

QA Magazine, a bi-monthly publication from GIE Media, provides digital and print publications for the food and beverage processing industry with a specific focus on food safety, quality, and defense across the global supply chain. Through practical insights and analysis of plant processes, practices, regulation, and current issues, the QA Media family—including our print publication, Website and e-newsletters—addresses the growing market need for targeted information in these key areas. www.qualityassurancemag.com.

QuoData GmbH Quality & Statistics **547**
Prellerstraße 14
Dresden, Saxony 01309, Germany
Phone: +49.351.402.886.70
http://www.quodata.de/en

QuoData is based in Germany and offers services, web-based software and training for analytical quality assurance.

It is no coincidence that QuoData cooperates with well-known partners such as the German Federal Office of Consumer Protection and Food Safety, BVL. For more than 20 years QuoData contributes to improving food safety with forward-thinking approaches for quality assurance based on unique expertise in statistics and machine learning.

QuoData's multi-disciplinary team provides services in the field of method validation and process qualification as well as a full-service solution proficiency testing provider to its international clientele.

R & F Products **420**
2725 Curtiss St.
Downers Grove, IL 60515-4002, USA
Phone: +1 630.969.5300
www.rf-products.net

R & F Products is the developer/producer of chromogenic media in the forms of powdered and prepared plates and enrichment broths for food, environmental and clinical pathogens. R & F Products' mission is to produce unique and innovative chromogenic plating media and enrichment broths that will enhance and improve laboratory efficiency, accuracy, sensitivity and specificity for pathogen isolation. R & F Products has 13 media patent/pat-ent applications for chromogenic media isolating the following pathogens: *Escherichia coli* O157:H7, *Listeria monocytogenes*, *Salmonella*, *Bacillus cereus*/*Bacillus thuringiensis*, *Enterobacter sakazakii* (*Cronobacter* sp.), *Bacillus anthracis*, *Listeria* sp./*Listeria monocytogenes*, *Listeria* sp., *Shigella* sp., *Campylobacter jejuni*/*C. coli*, *Yersinia pestis*, and non-O157 STEC.

Randox Food Diagnostics **647**
55 Diamond Road
Crumlin, BT29 4QY, United Kingdom
Phone: +28.944.224.13
www.randoxfood.com

Randox Food Diagnostics is an international supplier of food safety analyzers and reagents for the detection of mycotoxins, antimicrobials, growth promoting hormones and drugs of abuse in animals and produce.

The Randox product range includes the Biochip Array Technology (BAT) analyzer, the Evidence Investigator and a range of ELISAs. BAT allows simultaneous screening of multiple analytes from a single sample, offering major efficiencies in comparison to traditional ELISA. This technology is proven to be applicable in a wide range of settings including; drug residue screening, private/public research applications, clinical laboratories, and veterinary laboratories.

Reading Thermal **344**
7 Corporate Blvd.
Sinking Spring, PA 19608, USA
Phone: +1 610.678.5890
www.readingthermal.com

The SCORPION® 2 Profiling System has become a standard in the baking industry providing a complete measurement system to capture the four key baking parameters: Temperature, Airflow, Heat Flux and Humidity. With the SCORPION® 2 System, you can measure and analyze baking, drying and cooling thermal processes. The SCORPION® 2 enables you to monitor real-time in-process conditions giving you the critical information you need to correct problems and maintain optimum process conditions. The SCORPION® 2 Software (SV8) Food Safety Module enables bakers to easily comply with the FSMA Kill Step Validation requirements.

Remco **239**
4735 West 106th St.
Zionsville, IN 46077, USA
Phone: +1 317.876.9856
www.remcoproducts.com

The tools Remco has provided to food processors have played a critical role in food safety for over 30 years. As a part of the Vikan family, we support food manufacturers by providing hygienic, innovative, durable, and efficient tools in more colors than other suppliers. Remco's color-coded products and unmatched customer support help manufacturers improve food safety.

As Vikan's dedicated presence in North America, Remco will deliver even greater support to customers through our combined industry knowledge and top-of-the-line products. We strive to provide lasting value for our customers while we help them improve their own food safety efforts.

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Rheonix, Inc. **435**
10 Brown Road
Ithaca, NY 14850, USA
Phone: +1 607.257.1242
www.rheonix.com

The Rheonix Encompass Optimum™ workstation is a fully automated system that provides rapid, highly multiplexed sample-to-answer molecular testing for food and beverage. With one pipette step per sample, the system offers true walkaway simplicity. Rheonix's *Listeria* PatternAlert™ assay enables food producers to quickly identify recurring *Listeria* patterns in their facilities direct from enrichments, with no need to isolate strains in pure culture. Rheonix's portfolio of multiplexed testing solutions also includes the Beer SpoilerAlert™ assay, the most comprehensive beer spoilage panel available. With Rheonix, getting more information from your sample has never been easier.

Romer Labs® **439**
1301 Stylemaster Drive
Union, MO 63084, USA
Phone: +1 302.781.6400
www.romerlabs.com

Romer Labs® is a leading provider of diagnostic test solutions for the food industry. We specialize in analytical services and rapid test kits for the detection of food pathogens, food allergens, mycotoxins, drug residues, and GMOs. Our broad range of innovative tests and services play a pivotal role in integrated food safety management programs. Our fundamental objective at Romer Labs® is to provide cost-effective, validated products and services for "Making the World's Food Safer."

RQA, Inc. **527**
10608 W 163rd Place
Orland Park, IL 60467, USA
Phone: +1 630.512.0011
www.rqa-inc.com

RQA is a global leader in providing quality assurance and food safety solutions to the food industry, including retail quality audits, counterfeit investigation, consumer complaint retrieval, product retrieval and recall services. With our crisis planning and management and RQA's Food Forensics™ contaminant investigation services, we offer the most comprehensive quality and risk management support available. Whether you need to assess your product quality and market conditions at retail, retrieve consumer complaint or competitive samples, perform vulnerability assessments as part of your Food Defense Plan development, optimize your Crisis Management capabilities, or even execute a product recall, RQA can help.

Safe Food Alliance **134**
710 Striker Ave.
Sacramento, CA 95834, USA
Phone: +1 916.561.5900
www.safefoodalliance.com

Safe Food Alliance is a technical service organization focused on addressing the needs of the food industry with a special emphasis on California's specialty crops. With rapidly growing expectations from regulators, consumers, and retail outlets, we help companies become more proactive in their approach to food safety practices. Safe Food Alliance offers technical services to growers, packers, processors and food manufacturers to aid in their efforts to maintain the highest standards in food safety.

Safefood 360° **645**
100 Park Ave., 16th Floor
New York, NY 10017, USA
Phone: +1 855.FOOD.360
https://www.safefood360.com

The complete Food Safety, Quality and Compliance Management Software for the Forward-Thinking Enterprise Food Company. Built by food industry experts to allow you to implement, maintain and adapt to continuously changing legal and commercial compliance requirements.

Time, resources and knowledge are required to maintain compliance in the form of a food safety management system. Unlike current paper-based systems, Safefood 360° breaks new ground by combining purpose-built software and domain expertise with Business Intelligence to meet the requirements of food safety management in a smarter and more efficient manner than possible before.

SafeTraces, Inc. **255**
6111 Johnson Court, Suite 200
Pleasanton, CA 94588, USA
Phone: +1 925.326.1200
www.safetraces.com

SafeTraces is propelling food tech into the future, using nature's own DNA to make food production safer, more transparent, and less wasteful. Our patented, food-safe solutions use natural DNA to trace food, not the packaging, and to verify the success of cleaning and sanitation – all of this in minutes to provide clarity about the safety, purity, and provenance of our food in real time.

SAI Global **368**
20 Carlson Court, Suite 200
Toronto, ON M9W 7K6, Canada
Phone: +1 416.401.8700
www.saiglobal.com/foodsafety

Sartorius Corp. **248**
5 Orville Drive
Bohemia, NY 11716, USA
Phone: +1 734.436.8208
www.sartorius.com

Although well known as a leading international pharmaceutical and laboratory equipment supplier, Sartorius is actually working with and for a wide range of customers across practically every industry. With innovative and intuitive products and solutions, we help increase efficiency and productivity whether in routine or complex lab processes or industry specific workflows. Count on our support in diverse applications across a broad range of technology-intensive industries, such as the food and beverage, automotive, chemical, environmental testing, medical devices, paint coating industries.

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Sentry Equipment **413**
966 Blue Ribbon Circle North
Oconomowoc, WI 53066, USA
Phone: +1 262.567.7256
https://sentry-equip.com

Sentry Equipment leverages proven abilities in engineering and manufacturing to help customers sample, monitor and measure their processes in a variety of markets and applications worldwide. The Sentry brand of representative sampling products and services enables customers to achieve safe, accurate and repeatable results to protect the people, products and environments that matter the most. Since 1924, Sentry Equipment has been a reliable partner for operational and analytical professionals in the U.S. and global markets. As a 100% employee-owned company based in Oconomowoc, Wisconsin, its 180 employee owners serve customers in over 50 countries across six continents. For more information, please visit www.sentry-equip.com.

Seward Laboratory Systems Inc. **562**
155 Keyland Court
Bohemia, NY 11716, USA
Phone: +1 631.337.1808
www.sewardusa.com

Seward manufactures the leading range of Stomacher® paddle blenders used in sample preparation for microbiological analysis. For accurate, repeatable results, choose the Stomacher® – the original and still the best.

SGS **328**
201 Route 17 North
Rutherford, NJ 07070, USA
Phone: +1 201.508.3000
www.foodsafety.sgs.com

SGS is a world-leading inspection, verification, testing, and certification company. Recognized as the global benchmark for quality and integrity, we provide competitive advantage, drive sustainability, and deliver trust. With more than 97,000 employees, we operate a network of more than 2,600 offices and laboratories around the world. SGS offers a wide range of solutions covering the entire food supply chain from primary production and manufacturing, to retail and foodservice. With a comprehensive range of independent inspection, testing, training, certification, and technical services specific for the food sector, we help companies worldwide to monitor and validate safety, quality, and sustainability.

SnapDNA **469**
897 Independence Ave., #2C
Mountain View, CA 94043, USA
Phone: +1 650.265.6904
www.snapdna.com

SnapDNA has developed the fastest pathogen test in the industry. Sample-to answer in 20 minutes, our technology eliminates the need to culture bacteria, enabling on-site analysis of environmental and food samples. Our RNA/DNA-based platform is the first True Rapid™ test to meet or exceed every critical metric. The SnapDNA system is compatible with industry established and accepted sample sizes, can detect and analyze live cells only, and delivers quantitative results with near-zero false positive accuracy. SnapDNA is poised to deliver the next generation of analytical tools for food safety, with tipping point technology.

Solus Scientific **545**
9 Mansfield Networkcentre, Concorde Way
Mansfield, Nottinghamshire NG19 7JZ, United Kingdom
Phone: +44 1623 429701
www.solusscientific.com

In a fast-paced food testing environment, it is critical to process samples quickly and efficiently, enabling the production facility to release product, reduce inventory, or take prompt corrective actions when necessary. Solus Scientific produces pathogen testing systems that have been specifically developed with these constraints in mind. Introducing Solus One *Listeria* and Solus One *Salmonella* for next-day results following a single enrichment step. AOAC and AFNOR certified, our kits are employed worldwide. Committed to food safety excellence, our assays bring significant productivity benefits to our customers. Talk to us to learn how we can save you time and money.

Springer Nature **148**
233 Spring St.
New York, NY 10013, USA
Phone: +1 212.460.1500
www.springernature.com

Springer Nature is one of the world's leading global research, educational and professional publishers, home to an array of respected and trusted brands providing quality content through a range of innovative products and services. Springer Nature is the world's largest academic book publisher and numbers almost 13,000 staff in over 50 countries. www.springernature.com.

Steamericas, Inc. **147**
808 Hindry Ave., Unit E
Inglewood, CA 90301, USA
Phone: +1 844.US.STEAM
www.steam.am

Dry and high temperature steam generated by the Optima Steamer can be easily incorporated into daily and periodic cleaning (both CIP and COP) to ensure proper sanitation and removal of bio-films and most common food pathogens such as *Listeria*, *E. coli*, *Salmonella* and *Campylobacter*. Dry steam requires a fraction of water and no chemicals (ideal for kosher and organic processors). Steam cleaning does not generate wastewater runoff or overspray, which provides a flexible solution for dry clean facilities.

Sterilex **312**
111 Lake Front Drive
Hunt Valley, MD 21030, USA
Phone: +1 443.541.8800
www.sterilex.com

Sterilex develops proprietary, sanitation technologies designed to remove biofilm, provide high level disinfection, and enhance sanitation. Sterilex award-winning products are considered a best practice for the control of harmful organisms such as *Listeria, E. coli* and *Salmonella* on a wide variety of food contact and environmental surfaces. Sterilex products are used in a variety

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of sanitation applications including foaming and soaking programs, drain treatment, spiral freezer sanitization, and microbial threat detection. Sterilex technologies have proven to eliminate environmental sanitation challenges and increase shelf life, resulting in an enhanced sanitation program. Visit us to learn more about innovative solutions for microbial control.

STOP Foodborne Illness **568**
4809 N Ravenswood St., Suite 214
Chicago, IL 60640, USA
Phone: +1 773.269.6555
www.stopfoodborneillness.org

STOP Foodborne Illness is a national nonprofit, public health organization dedicated to preventing illness and death from foodborne pathogens by promoting sound food safety policy and best practices, building public awareness, and assisting those impacted by foodborne illness.

Suttner America Co. **470**
14864 West Ridge Lane
Dubuque, IA 52003, USA
Phone: +1 563.556.3212
www.suttner.com

For over 50 years Suttner America has been the leading manufacturer of spray components for applying sanitizers, degreasers, disinfectants and rinsing in food processing facilities. Our products are German designed and engineered to handle the toughest cleaning applications. Product range includes HACCP color coded ready spray guns, spray nozzles, spray wands, hoses, injectors and accessories. Our management team is experienced and driven by a true commitment to customers' needs. The Suttner team has extensive experience and provides the technical support needed. We specialize in personal service, spending time with customers over the phone or in person to diligently understand customers' needs and markets.

TAAG Genetics **367**
1050 Lakes Drive, Suite 225
West Covina, CA 91790, USA
Phone: +1 213 915 8099
www.taag-genetics.com

We are specialized in creating solutions for microbiological analysis to help food companies produce safer and better products. We developed TAAG Food Safety Intelligence (TFSi), a dynamic microbiological program based on genetic testing and artificial intelligence for maximizing food safety. With the TFSi program you will have all covered, from electronic on-site sampling and dynamic environmental monitoring plan to genetic testing kits and automated real time data analysis. Our kits, TAAG's nPLEX, can detect up to four pathogens in one single qPCR reaction in 22-26 hrs (enrichment included). Implement nPLEX, generate important savings, simplify the workflow and increase productivity.

TandD US, LLC **266**
534 N Guadalupe St., #32886
Santa Fe, NM 87501, USA
Phone: +1 518.669.9227
www.tandd.com

TandD Corporation manufactures a comprehensive line of wireless and stand-alone data loggers with innovative web-based data collection, remote monitoring and notification features, included in the product lineup are models that incorporate Wi-Fi connectivity for automatic uploading of data to the company's free WebStorage Service, where customers can view, share and archive their recorded data without paying monthly fees. TandD Corporation, a leading supplier of wireless data loggers, and has been engaged in the design, development and manufacture of high reliability, high quality electronic measurement systems since 1986.

Tasmanian Institute of Agriculture **650**
College Road, Tasmania
Hobart, 7001, Australia
Phone: +1 813.510.0277
http://www.utas.edu.au.tia

The Tasmanian Institute of Agriculture (TIA), located in Tasmania, Australia, is dedicated to research and development of sustainable agricultural industries. Founded in 1996, it is a collaborative effort of the University of Tasmania (UTAS) and the Tasmanian Government.

ComBase (www.combase.cc), a partnership between TIA and the U.S. Department of Agriculture, is a free public database that describe microbial responses to food environments, and is accessed by more than 56,000 registered users. CB Premium (www.cbpremium.org), founded by TIA, uniquely focuses on food-based peer-reviewed predictive models that help the food industry innovate, develop Food Safety Plans, and comply with regulatory policy.

TEGAM Inc. **150**
10 TEGAM Way
Geneva, OH 44041, USA
Phone: +1 440.466.6100
www.tegam.com

TEGAM designs and manufactures test and measurement equipment with a line of thermometry products created for Food Safety Applications. TEGAM will be demonstrating data logging wireless thermometers, the Free TEGAM Cloud App that can collect your data and the software package you need to integrate that data into your QMS or ERP system. TEGAM will also present their new 940/945, a handheld thermocouple calibrators.

Testo North America **337**
2 West Market St., Suite 500
West Chester, PA 19382, USA
Phone: +1 800.227.0729
www.testofoodsafety.com

Testo North America is a leader in the design, development, and manufacture of portable measurement instrumentation. The fully integrated Testo Saveris system (Hardware/Software/Services),

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fulfills the compliance gap and leads the food safety market into a new era. Executives can now automate checks, create visibility and improve accountability. Saveris changes the dynamic from paper-based reporting to automated exception management through software notifications.

Thermo Fisher Scientific **327**
12076 Santa Fe Trail Drive
Lenexa, KS 66215, USA
Phone: +1 800.255.6730
www.thermofisher.com

Thermo Fisher Scientific is the world leader in serving science. Our mission is to enable our customers to make the world healthier, cleaner and safer. We believe we are uniquely positioned to help the food industry effectively protect consumers, brand and reputation by delivering simpler, faster and smarter solutions. Positioned to meet your changing needs, we can help you to remain adaptive, responsive, and competitive. To find out more stop by Booth #327, visit thermofisher.com/foodandbeverage or join our blog at www.thermofisher.com/examiningfood, a forum for information, discussion and analysis of some of the issues faced in the food industry today.

ToxStrategies **532**
23501 Cinco Ranch Blvd., B226
Katy, TX 77494, USA
Phone: +1 866.764.5840
www.toxstrategies.com

ToxStrategies is a scientific consulting firm that provides innovative solutions to the technical and regulatory challenges confronting our clients. We have a reputation for applying sound science and tailoring our approach to meet the specific needs of our clients.

Our health scientists, regulatory specialists, and engineers are leaders in their respective disciplines and, collectively, have extensive experience assessing health risks associated with consumer products, food ingredients and additives, pharmaceuticals, medical devices, pesticides, industrial chemicals, and environmental contaminants.

The small size of our firm enhances our flexibility and efficiency, which translates to reduced costs and greater satisfaction for our clients.

TriStrata Group **366**
12685 Miller Road NE
Bainbridge Island, WA 98110, USA
Phone: +1 206.780.5552
www.tristratagroup.com

We are a team of scientists, engineers and technicians with the food safety experience to deliver comprehensive solutions for better outcomes. TriStrata ozone systems add strategic interventions as part of your multi-hurdle food protection approach. We provide an added layer of food safety protection without the health risks and environmental drawbacks associated with conventional chemicals.

USDA National Agricultural Library Food Safety Research Information Office **536**
10301 Baltimore Ave.
Beltsville, MD 20705, USA
Phone: +1 701.320.7837
https://www.nal.usda.gov/fsrio

The Food Safety Research Information Office (FSRIO) supports the research community by collecting, organizing and disseminating food safety information in accordance with the Agricultural Research, Extension, and Education Reform Act of 1998. Our mission is to provide the food safety research community and general public with information on publicly and privately funded food safety research. FSRIO works to assist the federal government and private research entities in the assessment of food safety research needs and priorities, and to prevent unintended duplication of food safety research.

Weber Scientific **309**
2732 Kuser Road
Hamilton, NJ 08691, USA
Phone: +1 800.328.8378
www.weberscientific.com

On display are many innovative new products distributed by Weber Scientific, including Kikkoman's LuciPac™ A3™ Sanitation System that produces a test result an order of magnitude or higher than competitive products, the new Weber Scientific MegaSampler Sampling Device making environmental surface sampling faster and easier, and new varieties of the Charm Peel Plate Microbial Tests for *S. aureus* and Coliform, Coliform/*E. coli*, *Enterobacteriaceae* for cultured dairy products. Weber Scientific distributes laboratory supplies and equipment throughout North America and is focused on the specialized testing needs of the food and beverage industry. We promote quality control by making the acquisition of testing supplies as easy and affordable as possible.

Whirl-Pak® **136**
901 Janesville Ave.
Fort Atkinson, WI 53538, USA
Phone: +1 920.568.5616
www.whirl-pak.com

At Whirl-Pak®, we are committed to making the world a safer place by providing better products that produce better integrity in the results.

For 60 years, Whirl-Pak® has held itself to a higher standard. As an ISO 9001 certified facility, we have been a trusted partner to the lab sampling and testing industry by providing solutions for the critical requirements of our customers. From post-manufacturing sterilization to puncture-proof tabs, Whirl-Pak® has a long history of providing value through our commitment in developing leading-edge products that set a new standard in reliability. Whirl-Pak®, results you can trust.

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World Bioproducts **130**
P.O. Box 947
Bothell, WA 98041, USA
Phone: +1 425.242.4153
www.worldbioproducts.com

World Bioproducts provides innovative environmental sample collection devices and convenient pre-filled dilution blanks and media. The EZ Reach™ Sponge Sampler, Sample- Right™ Sponge Sampler, and PUR-Blue™ Swab Sampler are designed to address the specific challenges of recovering microorganisms from the food processing environment. All are available with our proprietary HiCap™ Neutralizing Broth, proven to more effectively neutralize residual sanitizers than other collection solutions, allowing for better recovery and detection of microorganisms from surfaces.

XENON **157**
37 Upton Drive
Wilmington, MA 01887, USA
Phone: +1 978.661.9033
www.xenoncorp.com

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Policy on Commercialism
for Annual Meeting Presentations

1. INTRODUCTION

No printed media, technical sessions, symposia, posters, seminars, short courses, and/or other related types of forums and discussions offered under the auspices of the International Association for Food Protection (hereafter referred to as to Association forums) are to be used as platforms for commercial sales or presentations by authors and/or presenters (hereafter referred to as authors) without the express permission of the staff or Executive Board. The Association enforces this policy in order to restrict commercialism in technical manuscripts, graphics, oral presentations, poster presentations, panel discussions, symposia papers, and all other type submissions and presentations (here-after referred to as submissions and presentations), so that scientific merit is not diluted by proprietary secrecy.

Excessive use of brand names, product names or logos, failure to substantiate performance claims, and failure to objectively discuss alternative methods, processes, and equipment are indicators of sales pitches. Restricting commercialism benefits both the authors and recipients of submissions and presentations.

This policy has been written to serve as the basis for identifying commercialism in submissions and presentations prepared for the Association forums.

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

The presentation of new technical information is to be encouraged. In addition to the commercialism evaluation, all submissions and presentations will be individually evaluated by the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff on the basis of originality before inclusion in the program.

2.2 Substantiating Data

Submissions and presentations should present technical conclusions derived from technical data. If products or services are described, all reported capabilities, features or benefits, and performance parameters must be substantiated by data or by an acceptable explanation as to why the data are unavailable (e.g., incomplete, not collected, etc.) and, if it will become available, when. The explanation for unavailable data will be considered by the Program Committee chairperson and/or technical reviewers selected by the Program Committee chairperson to ascertain if the presentation is acceptable without the data. Serious consideration should be given to withholding submissions and presentations until the data are available, as only those conclusions that might be reasonably drawn from the data may be presented. Claims of benefit and/or technical conclusions not supported by the presented data are prohibited.

2.3 Trade Names

Excessive use of brand names, product names, trade names, and/or trademarks is forbidden. A general guideline is to use proprietary names once and thereafter to use generic descriptors or neutral designations. Where this would make the submission or presentation significantly more difficult to understand, the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff, will judge whether the use of trade names, etc., is necessary and acceptable.

2.4 "Industry Practice" Statements

It may be useful to report the extent of application of technologies, products, or services; however, such statements should review the extent of application of all generically similar technologies, products, or services in the field. Specific commercial installations may be cited to the extent that their data are discussed in the submission or presentation.

2.5 Ranking

Although general comparisons of products and services are prohibited, specific generic comparisons that are substantiated by the reported data are allowed.

2.6 Proprietary Information (See also 2.2.)

Some information about products or services may not be publishable because it is proprietary to the author's agency or company or to the user. However, the scientific principles and validation of performance parameters must be described for such products or services. Conclusions and/or comparisons may be made only on the basis of reported data.

2.7 Capabilities

Discussion of corporate capabilities or experiences are prohibited unless they pertain to the specific presented data.

3. GRAPHICS

3.1 Purpose

Slides, photographs, videos, illustrations, art work, and any other type visual aids appearing with the printed text in submissions or used in presentations (hereafter referred to as graphics) should be included only to clarify technical points. Graphics which primarily promote a product or service will not be allowed. (See also 4.6.)

3.2 Source

Graphics should relate specifically to the technical presentation. General graphics regularly shown in, or intended for, sales presentations cannot be used.

3.3 Company Identification

Names or logos of agencies or companies supplying goods or services must not be the focal point of the slide. Names or logos may be shown on each slide so long as they are not distracting from the overall presentation.

3.4 Copies

Graphics that are not included in the preprint may be shown during the presentation only if they have been reviewed in advance by the Program Committee chairperson, session convenor, and/or staff, and have been determined to comply with this policy. Copies of these additional graphics must be available from the author on request by individual attendees. It is the responsibility of the session convenor to verify that all graphics to be shown have been cleared by Program Committee chairperson, session convenor, staff, or other reviewers designated by the Program Committee chairperson.

4. INTERPRETATION AND ENFORCEMENT

4.1 Distribution

This policy will be sent to all authors of submissions and presentations in the Association forums.

4.2 Assessment Process

Reviewers of submissions and presentations will accept only those that comply with this policy. Drafts of submissions and presentations will be reviewed for commercialism concurrently by both staff and technical reviewers selected by the Program Committee chairperson. All reviewer comments shall be sent to and coordinated by either the Program Committee chairperson or the designated staff. If any submissions are found to violate this policy, authors will be informed and invited to resubmit their materials in revised form before the designated deadline.

4.3 Author Awareness

In addition to receiving a printed copy of this policy, all authors presenting in a forum will be reminded of this policy by the Program Committee chairperson, their session convenor, or the staff, whichever is appropriate.

4.4 Monitoring

Session convenors are responsible for ensuring that presentations comply with this policy. If it is determined by the session convenor that a violation or violations have occurred or are occurring, he or she will publicly request that the author immediately discontinue any and all presentations (oral, visual, audio, etc.) and will notify the Program Committee chairperson and staff of the action taken.

4.5 Enforcement

While technical reviewers, session convenors, and/or staff may all check submissions and presentations for commercialism, ultimately it is the responsibility of the Program Committee chairperson to enforce this policy through the session convenors and staff.

4.6 Penalties

If the author of a submission or presentation violates this policy, the Program Committee chairperson will notify the author and the author's agency or company of the violation in writing. If an additional violation or violations occur after a written warning has been issued to an author and his agency or company, the Association reserves the right to ban the author and the author's agency or company from making presentations in the Association forums for a period of up to two (2) years following the violation or violations.

2019 WORKSHOPS

Friday, July 19 – 8:00 a.m. – 5:00 p.m. (1 day)

Using Data and Statistical Analysis to Guide Food Safety Decision Making

Instructors:

- Courtney Bokenkroger, Arm & Hammer Animal and Food Production, Fort Collins, CO, USA
- John Ihrie, U.S. Food and Drug Administration – Center for Food Safety and Applied Nutrition, College Park, MD, USA
- Frank Rossi, PepsiCo Research and Development, Plano, TX, USA
- David Smith, Mississippi State University, Mississippi State, MS, USA
- Kimberly Woodruff, Mississippi State University, Mississippi State, MS, USA
- Stephen W. Mamber, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

Organizers:

- Mark Kreul, In-N-Out Burger, Baldwin Park, CA, USA
- Stephen W. Mamber, U.S. Department of Agriculture – FSIS, Washington, D.C., USA

The use of statistical methods by food safety professionals is often met with "fear and loathing." This workshop is intended for food safety personnel at all levels who require the use of statistical methods to analyze their data, but have little or no training in such methods. Among the topics to be covered are as follows:

- Data and descriptive summary statistics (averages, medians, standard deviation, normal distribution, etc.)
- Experimental conditions that yield independent versus dependent observations
- Estimation calculations of error rates and statistical power
- The null hypothesis and statistical hypothesis testing
  - Parametric methods (e.g., Chi-square, *t*-tests, analysis of variance [ANOVA])
  - Non-parametric methods (e.g., Wilcoxon ranking tests, Kruskal-Wallis ANOVA)
- Correlation and regression analysis (linear and non-linear)
- The use of computer software (e.g., Excel, SAS, JMP, R) to manage data and perform statistical analyses
- Importing and visualizing data into statistical software (R, Tableau, etc.)
- Statistical methods specifically applicable to food safety, e.g., process control

This workshop will be taught by statisticians from a combination of the U.S. Department of Agriculture's Food Safety and Inspection Service, the U.S. Food and Drug Administration's Center for Food Safety and Applied Nutrition, academia and industry. Participants will be encouraged to "stump the experts" by bringing their real-world statistical analysis issues to the workshop. At the end of the workshop, participants will be able to confidently analyze their data and will have a new-found appreciation for various statistical methods.

Friday, July 19 – 8:00 a.m. – 5:00 p.m. and Saturday, July 20 – 8:00 a.m. – 5:00 p.m. (2 days)

Developing Environmental Monitoring Programs for Small and Midsize Processors

Instructors:

- Jeremy Adler, Ecolab Inc., Ault, CO, USA
- James Dickson, Iowa State University, Ames, IA, USA
- Douglas Marshall, Eurofins Scientific Inc., Fort Collins, CO, USA
- Gregory Siragusa, Eurofins Microbiology, New Berlin, WI, USA
- Purnendu Vasavada, University of Wisconsin-River Falls, River Falls, WI, USA

Organizer:

- Douglas Marshall, Eurofins Scientific Inc., Fort Collins, CO, USA

This previously well-subscribed workshop using established academic and industrial experts will give small and midsize produce, spice, condiment, bakery, and ingredient suppliers the tools necessary to address four food safety issues in the processing environment: (1) finding spoilage microorganisms in the environment before they affect product, (2) finding allergens in the environment before they affect product, (3) finding pathogens in the environment before they contaminate product, and (4) assessing effectiveness of cleaning, sanitation, and employee hygiene practices. The first speaker will discuss regulatory perspectives, customer expectations, and characteristics of microbial and chemical contaminants. The second will present an analytical methods overview. The third will discuss data interpretation and source tracking. The last presenter will address remedial sanitation practices. A practical session at a local food microbiology laboratory will include information on how to collect samples, tools for collection, sample handling, and testing. The workshop will conclude with another breakout session where attendees will work through a case study. Attendees will receive a workbook and two easy-to-use Environmental Monitoring Program guides, one on pathogens and one on allergens.

2019 WORKSHOPS

Friday, July 19 – 8:00 a.m. – 5:00 p.m. and Saturday, July 20 – 8:00 a.m. – 12:00 p.m. (1.5 days)

Validating Pasteurization Processes for Low-moisture Products

Instructors:

- Nathan Anderson, U.S. Food and Drug Administration, Bedford Park, IL, USA
- Hongda Chen, USDA National Program Leader, Washington, D.C., USA
- Elizabeth M. Grasso-Kelley, Illinois Institute of Technology, Bedford Park, IL, USA
- Ian Hildebrandt, Michigan State University, East Lansing, MI, USA
- Susanne Keller, U.S. Food and Drug Administration, Bedford Park, IL, USA
- Lisa Lucore, Shearer's Foods, Massillon, OH, USA
- Bradley Marks, Michigan State University, East Lansing, MI, USA
- Harshavardhan Thippareddi, University of Georgia, Athens, GA, USA

Organizers:

- Nathan Anderson, U.S. Food and Drug Administration, Bedford Park, IL, USA
- Elizabeth Grasso-Kelley, Illinois Institute of Technology, Bedford Park, IL, USA
- Bradley Marks, Michigan State University, East Lansing, MI, USA
- Harshavardhan Thippareddi, University of Georgia Athens, GA, USA

FSMA Preventive Controls Rules require processors to validate *Salmonella* reduction processes for low-moisture foods. Few programs educate, train, or prepare individuals to deal with the unique challenges associated with low-moisture pasteurization. Individuals assigned these responsibilities in industry often lack experience in the unique validation challenges posed by these products. General process validation training typically has significant gaps, relative to unique attributes of low-moisture foods, in terms of both engineering and microbiological principles.

This workshop is designed to fill that gap, at a critical time for the industry. Experts from industry, academia, and government will lead participants through a systematic approach to preparing for, designing, and carrying out a low-moisture process validation. The workshop will include interactive/hands-on case studies. Upon completion of this workshop, participants should be able to: describe regulatory expectations, explain critical factors affecting *Salmonella* resistance to lethal treatments, outline a general process for conducting a low-moisture pasteurization validation, identify key variables to measure/control/report, and evaluate process efficacy based on the use of non-pathogenic surrogate data and/or inactivation models.

The previous workshop (IAFP 2017) received excellent feedback from participants (>4.5 out of a 5.0 scale for all quality indicators). In a one-year-post-workshop survey, attendees (86.7%) rated this workshop as "more impactful" or "much more impactful" than similar workshops they have attended. The only major comment was that one day was too short for this subject matter, which is why we are proposing to increase this to a 1.5-day workshop.

The ongoing phasing-in of the Preventive Controls Rules, important new research in the area, and continuing technology developments should make another offering of this workshop timely and in high demand.

2019 WORKSHOPS

Friday, July 19 – 1:00 p.m. – 5:00 p.m. and Saturday, July 20 – 8:00 a.m. – 5:00 p.m. (1.5 days)

Whole Genome Sequencing: A Tutorial and Hands-on Workshop to Understand and Implement This Breakthrough Technology

Instructors:

- Jennifer Beal, U.S. Food and Drug Administration, College Park, MD, USA
- Peter Cook, CDC, Atlanta, GA, USA
- Zachary Geurin, NSF International Ann Arbor, MI, USA
- Leslie Hintz, U.S. Food and Drug Administration, College Park, MD, USA
- Maria Hoffmann, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration, College Park, MD, USA
- Bill Klimke, NCBI, Washington, D.C., USA
- Maria Sanchez Leon, U.S. Food and Drug Administration, College Park, MD, USA

Organizers:

- Maria Hoffmann, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration College Park, MD, USA
- Jesse Miller, NSF International, Ann Arbor, MI, USA

Whole Genome Sequencing (WGS) has taken the Front Stage as a tool to understand the environment around us. It is being used globally to track outbreak strains of bacteria, monitor microbial communities and understand changes in populations of organisms based on temporal and forced stimuli. WGS is more complex than past methodologies (such as PFGE) and has more components that need to be understood. What is WGS? What is the science behind the technology? How do I perform an experiment? How do I analyze my data? What do the data mean? This workshop seeks to shed light on WGS so that the student will have a more holistic view of the applications of WGS. We will provide sessions on technology, data analysis and data interpretation that the FDA, CORE and Compliance employ for outbreak investigations and regulatory decision-making. Each attendee will be analyzing WGS datasets in command-line format to trim, assemble and build a phylogenetic tree. Finally, we will also learn about some available open source tools for data analysis that may be implemented for data analysis upon return from the workshop.

Saturday, July 20 – 8:00 a.m. – 5:00 p.m. (1 day)

Introduction to FDA–iRISK® 4.0: A Comparative Risk Assessment Tool with New Features and Case Studies

Instructors:

- Yuhuan Chen, U.S. Food and Drug Administration–CFSAN, College Park, MD, USA
- Vijay Juneja, U.S. Department of Agriculture-ARS-ERRC, Wyndmoor, PA, USA
- Gregory Paoli, Risk Sciences International Ottawa, ON, Canada

Organizer:

- Yuhuan Chen, U.S. Food and Drug Administration–CFSAN, College Park, MD, USA

Risk assessments predict risk and changes in risk, to inform food-safety decisions. FDA-iRISK 4.0 – the latest, enhanced version – is a Web-based, comparative risk-assessment tool available to the public, without cost, since 2017. This peer-reviewed tool has many built-in functions and automated features that enable users to conduct fully probabilistic risk assessments efficiently. It enables users to build, view, and share scenarios that reflect their real-world or theoretical food-safety issues. New and enhanced features in FDA-iRISK 4.0 include, for example, substantial capacities with which users can explicitly include probabilistic uncertainty and variability (by second-order Monte Carlo simulation), incorporate predictive models (for microbial growth and inactivation), and access new options for modeling the process pathway (such as effect of sampling on risk reduction).

This workshop will provide a guided, hands-on opportunity to explore FDA-iRISK 4.0, build and run quantitative risk assessment models, and access examples in a shared repository. Participants will learn how to use FDA-iRISK 4.0 to (1) rank food-safety risks from microbial and chemical hazards, and (2) predict effectiveness of interventions applied at any points from farm to table (predict changes in contamination and illness resulting from changes in production practices). The workshop will introduce attendees to advanced features, as well as illustrate the capacity of FDA-iRISK 4.0 to store evidence for risk scenarios in a consistent, structured, and systematic fashion. Instructors will present case studies (including how predictive modeling of growth and inactivation can fit in), to demonstrate the application of FDA-iRISK 4.0 as both a Web-based database and a quantitative risk-assessment tool in real-world scenarios that are explored by stakeholders, including government agencies and industry.

Workshop participants are asked to bring a laptop or a tablet for the hands-on exercise. Internet connection required to access FDA-iRISK 4.0 will be provided (no other software is needed).

2019 WORKSHOPS

Saturday, July 20 – 8:00 a.m. – 5:00 p.m. (1 day)

Principles for Establishing and Extending Shelf Life

Instructors:

- Cari Lingle, 3M Food Safety, St. Paul, MN, USA
- Abigail Snyder, The Ohio State University, Columbus, OH, USA
- Martin Wiedmann, Cornell University, Ithaca, NY, USA
- Randy Worobo, Cornell University, Ithaca, NY, USA

Organizers:

- John David, 3M Food Safety, St. Paul, MN, USA
- Adriana Robayo, 3M Food Safety, St. Paul, MN, USA

Microbial food quality starts with defined ingredient specifications, monitored processing conditions, and rigorous standards for finished product handling. Every day food processors, retailers, and consumers discard food due to microbial spoilage. This contributes to food waste, costly market withdraws, and can also damage a brand's reputation. Enhanced control over microbial spoilage is dependent on two key aspects of quality management: accurately predicting how long food remains within acceptability specifications and the subsequent establishment of product shelf life.

This workshop will provide the tools for common questions regarding premature product spoilage and shelf-life determinations through practical group breakout sessions focused on identifying the root-cause of spoilage and a standard methodology for establishing and monitoring the shelf life of a product. This includes critical factor identification, application and interpretation of data trending, leveraging statistical process control methods, selection of fit-to-purpose culture-dependent and independent microbiological techniques, and strengthening internal facility audits.

Participants will be guided through "how to" approach and properly identify the types of spoilage associated with specific products and processes when special-cause quality failures occur. Attendees will walk away with an enhanced ability to triage quality issues and more rapidly plan and implement corrective actions. The workshop will explore mitigating risks associated with shelf-life abbreviation and best practices and methods to determine shelf life. Breakout groups will conduct a root cause analysis of a mock quality deviation incident. Finally, attendees have the opportunity to work directly with instructors on how they will apply the concepts in their own operation.

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Questions regarding submissions can be directed to Tamara Ford

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2014 – Donald W. Schaffner
2015 – Donald L. Zink
2016 – Alejandro Mazzotta
2017 – Linda J. Harris
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1913 Chicago, IL
1914 Chicago, IL
1915 Washington, D.C.
1916 Springfield, MA
1917 Washington, D.C.
1918 Chicago, IL
1919 New York, NY
1920 Chicago, IL
1921 New York, NY
1922 St. Paul, MN
1923 Washington, D.C.
1924 Detroit, MI
1925 Indianapolis, IN
1926 Philadelphia, PA
1927 Toronto, Ontario
1928 Chicago, IL
1929 Memphis, TN
1930 Cleveland, OH
1931 Montreal, Quebec
1932 Detroit, MI
1933 Indianapolis, IN
1934 Boston, MA
1935 Milwaukee, WI
1936 Atlantic City, NJ
1937 Louisville, KY
1938 Cleveland, OH
1939 Jacksonville, FL
1940 New York, NY
1941 Tulsa, OK
1942 St. Louis, MO
1943 Cancelled
1944 Chicago, IL
1945 Cancelled
1946 Atlantic City, NJ
1947 Milwaukee, WI
1948 Philadelphia, PA
1949 Columbus, OH
1950 Atlantic City, NJ
1951 Glenwood Springs, CO
1952 Milwaukee, WI
1953 East Lansing, MI
1954 Atlantic City, NJ
1955 Augusta, GA
1956 Seattle, WA
1957 Louisville, KY
1958 New York, NY
1959 Glenwood Springs, CO
1960 Chicago, IL
1961 Des Moines, IA
1962 Philadelphia, PA
1963 Toronto, Ontario
1964 Portland, OR
1965 Hartford, CT
1966 Minneapolis, MN
1967 Miami Beach, FL
1968 St. Louis, MO
1969 Louisville, KY
1970 Cedar Rapids, IA
1971 San Diego, CA
1972 Milwaukee, WI
1973 Rochester, NY
1974 St. Petersburg, FL
1975 Toronto, Ontario
1976 Arlington Heights, IL
1977 Sioux City, IA
1978 Kansas City, MO
1979 Orlando, FL
1980 Milwaukee, WI
1981 Spokane, WA
1982 Louisville, KY
1983 St. Louis, MO
1984 Edmonton, Alberta
1985 Nashville, TN
1986 Minneapolis, MN
1987 Anaheim, CA
1988 Tampa, FL
1989 Kansas City, MO
1990 Arlington Heights, IL
1991 Louisville, KY
1992 Toronto, Ontario
1993 Atlanta, GA
1994 San Antonio, TX
1995 Pittsburgh, PA
1996 Seattle, WA
1997 Orlando, FL
1998 Nashville, TN
1999 Dearborn, MI
2000 Atlanta, GA
2001 Minneapolis, MN
2002 San Diego, CA
2003 New Orleans, LA
2004 Phoenix, AZ
2005 Baltimore, MD
2006 Calgary, Alberta
2007 Lake Buena Vista, FL
2008 Columbus, OH
2009 Grapevine, TX
2010 Anaheim, CA
2011 Milwaukee, WI
2012 Providence, RI
2013 Charlotte, NC
2014 Indianapolis, IN
2015 Portland, OR
2016 St. Louis, MO
2017 Tampa, FL
2018 Salt Lake City, UT

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Most-cited Research Publication Award

1st Place

Growth of *Escherichia coli* O157:H7 and *Listeria monocytogenes* in Packaged Fresh-Cut Romaine Mix at Fluctuating Temperatures during Commercial Transport, Retail Storage, and Display

Wenting Zeng, Keith Vorst, Wyatt Brown, Bradley P. Marks, Sanghyup Jeong, Fernando Pérez-Rodríguez, and Elliot T. Ryser

Published February 2014

2nd Place

Quantification, Serovars, and Antibiotic Resistance of *Salmonella* Isolated from Retail Raw Chicken Meat in Vietnam

Yen T. Ta, Trung Thanh Nguyen, Phuong Bich To, Da Xuan Pham, Hao Thi Hong Le, Giang Nguyen Thi, Walid Q. Alali, Isabel Walls, and Michael P. Doyle

Published January 2014

3rd Place

Antibiotic Resistance and Diversity of *Salmonella enterica* Serovars Associated with Broiler Chickens

Moussa Sory Diarra, Pascal Delaquis, Heidi Rempel, Susan Bach, Colleen Harlton, Mueen Aslam, Jane Pritchard, and Edward Topp

Published January 2014

Most-cited Review Publication Award

1st Place

Listeria monocytogenes Persistence in Food-Associated Environments: Epidemiology, Strain Characteristics, and Implications for Public Health

Vania Ferreira, Martin Wiedmann, Paula Teixeira, and Matthew J. Stasiewicz

Published January 2014

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1st Place

Kombucha, the Fermented Tea: Microbiology, Composition, and Claimed Health Effects

Cheryl J. Greenwalt, Keith H. Steinkraus, and Richard A. Ledford

Published July 2000

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Christine M. Bruhn

Published September–October 2014

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Charles P. Gerba, Laura Y. Sifuentes and Akrum H. Tamini

Published May–June 2017

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Jill C. Roberts

Published May–June 2017

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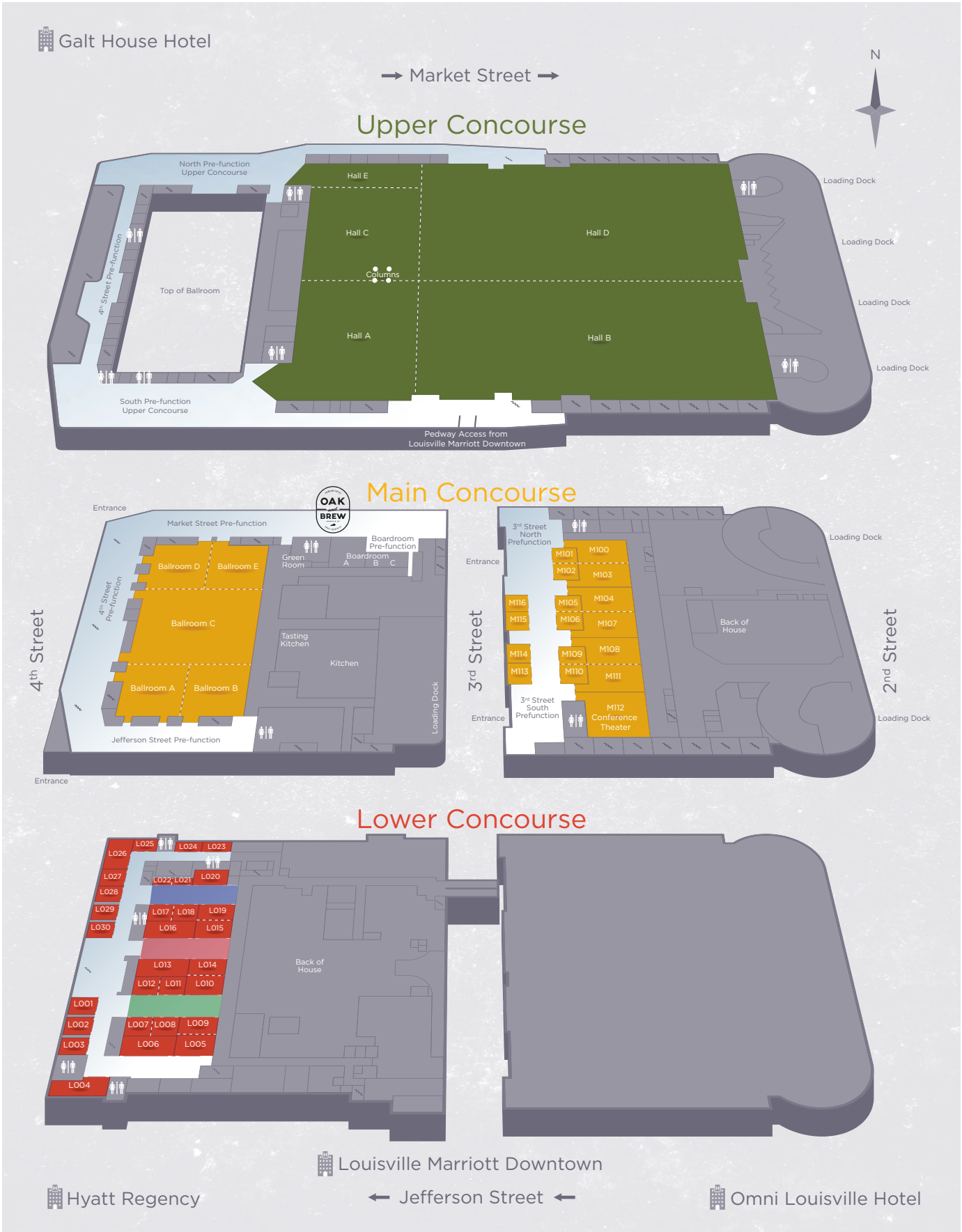

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