Thursday, April 15, 11:00 am – 1:00 pm US Eastern Time
Session 4 – Advances in Enhancing the Microbiology Safety of Foods

Session Chair: **Mike Doyle**, PhD, University of Georgia, United States (retired)

Biography: **Dr. Michael P. Doyle** is a retired Regent's Professor at the University of Georgia. He has published more than 500 scientific papers on food microbiology and food safety topics and has received many awards for his research accomplishments, including the Nicholas Appert Award of the Institute of Food Technologists. He is a fellow of the American Academy of Microbiology, the American Association for the Advancement of Science, the Institute of Food Technologists, the International Association for Food Protection, and the National Academy of Inventors, and is a member of the National Academy of Medicine. Dr. Doyle is the Co-Chair of the Global Board of Trustees of the International Life Sciences Institute and has also served for many years on the ILSI North America Board of Trustees.

1. **Foodborne Disease Outbreak Detection and Surveillance Using Whole Genome Sequencing, Kelley Hise**, MPH, Centers for Disease Control and Prevention (CDC), United States

Abstract: In July of 2019, PulseNet, the national molecular subtyping network for foodborne disease surveillance, transitioned to using whole genome sequencing as its primary method for detecting and investigating outbreaks of foodborne disease-causing bacteria. Since then, PulseNet has used this more advanced technology to detect and solve numerous single and multi-state outbreaks. In addition, it has opened the door to enhanced surveillance of these data, in order to better study sequences over time.

Biography: Kelley Hise is the Chief of the PulseNet Outbreak Detection and Surveillance Unit in the Enteric Diseases Laboratory Branch at the Centers for Disease Control and Prevention in Atlanta, GA. Mrs. Hise oversees the management of the foodborne bacterial pathogen databases of PulseNet USA; provides support for foodborne disease outbreak investigations; coordinates technical support and other communications with PulseNet participating laboratorians; and assesses PulseNet lab capacity.

2. Advances in Metagenomic Approaches to Detect Foodborne Pathogens, Henk den Bakker, PhD, University of Georgia, United States

Abstract: The introduction of whole genome sequencing as a novel tool has greatly advanced our understanding of the evolution and ecology of many microorganisms but especially foodborne pathogens. While culture-dependent whole genome sequencing still takes days to weeks to get from a sample to a sequenced genome of a pathogen, culture-independent metagenomic approaches can reduce this time to less than a few days. In this talk we look at current developments in both sequencing technologies and culture independent metagenomic protocols which speed up the time for detection of these pathogens and increase our knowledge of their ecology.

Biography: Henk C. den Bakker currently works as an assistant Professor in Bioinformatics at the Center for Food Safety of the University of Georgia. He received a PhD in Mycology at Leiden University in the Netherlands in 2005. From 2005 to 2014 Hendrik worked as a Research associate at Cornell University. Dr. den Bakker held a position as assistant professor in population modelling and statistics at the department of animal and food sciences at Texas Tech University. He (co-)authored more than 50 PubMed indexed publications on genomics and population genetics of foodborne pathogens and spoilage organisms. Dr. Den Bakker's current research focuses on the novel field of food safety informatics.

3. Applications and Future Potential of Next Generation Sequencing in Food Safety, Marc Allard, PhD, Food and Drug Administration (FDA), United States

Abstract: An international database of federal, state, academic and international laboratories has been using Whole Genome Sequencing (WGS) data to rapidly characterize pathogens since 2012. This GenomeTrakr network is part of NCBI Pathogen Detection web site. Public health agencies collect and share data in real time for source tracking of foodborne pathogens. This "open data" model allows greater transparency among all stakeholders. GenomeTrakr protocols are made available at protocols.io and data analysis pipelines are made available at GalaxyTrakr. Examples will be discussed on how global WGS data sharing advances the future potential for food safety.

Biography: Marc W. Allard received his Ph.D. in biology in 1990 from Harvard University. Dr. Allard was the Louis Weintraub Associate Professor of Biology (and Genetics) at George Washington University (Washington, DC) for 14 years. Dr. Allard joined the US Food and Drug Administration, Office of Regulatory Science, Division of Microbiology in 2008. He assists in building FDA's GenomeTrakr WGS network for source tracking of foodborne pathogens to rapidly identify outbreaks. Also, he supports publicly available tools and resources such as GalaxyTrakr and protocols.io to support the laboratories that collaborate in the GenomeTrakr network.

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4. **Impacts and Risk of COVID-19 in the Essential Workforce of the Food Supply Chain, Lee-Ann Jaykus**, PhD, North Carolina State University, United States

Abstract: Among the myriad implications of the COVID-19 pandemic has been direct and indirect effects on the food supply chain. From restaurant closures to supply chain interruptions, the most important of these, from a public health perspective, was assuring the health of the essential workforce. The purpose of this presentation is to highlight how worker health was impacted, what was done to reduce COVID-19 risk to the essential workforce, and which measures appear to be the most effective based on recent risk assessment efforts. The presentation will end with discussion of what the future may look like as vaccination coverage increases amongst the uncertainty of the duration of immunity and emerging SARS CoV-2 strains

Biography: Lee-Ann Jaykus is William Neal Reynolds distinguished professor in the Department of Food, Bioprocessing, and Nutrition at North Carolina State University. She directs an active research program in food microbiology and risk assessment and is probably best known for her work directing the USDA-NIFA Food Virology Collaborative (NoroCORE). Dr. Jaykus has mentored over 60 young scientists, supervised extramural funding in excess of $40 million, and authored over 200 publications. She has been a member of many national and international expert panels and is a former president of the International Association for Food Protection (IAFP). Early in the COVID-19 pandemic, Dr. Jaykus stepped in to work with the food industry, focusing on controlling disease transmission in the essential workforce.