

United Fresh and PMA Synopsis IAFP 2019, Louisville, KY

The annual meeting of the International Association for Food Protection brought together roughly 3800 food safety professionals from academia (including students who presented hundreds of posters and technical sessions), government, and the breadth of the food industry. Over the past several years an increasing number of sessions have focused on produce safety and a few more produce safety professionals seemed to be in attendance this year compared to previous years. This year, PMA's Trevor Suslow and Jill Dunlop and United's Jennifer McEntire and Emily Griep attempted to "divide and conquer" so that we could offer this brief synopsis, highlighting the produce safety topics that were discussed in this diverse forum.

The [2019 program agenda is still available on the IAFP website](#).

In [Tracing Produce: Where are we and what's next](#), PMA's Ed Treacy described the history and current status of the Produce Traceability Initiative. FDA's Katie Vierk noted that the Agency will issue a proposed rule aimed at improving traceability in September 2020, but also encouraged the industry to leverage technology, be interoperable, and make needed improvements regardless of regulations. She noted that investigations start at the point of sale/service, so traceability needs to be end-to-end. Tejas Bhatt described Walmart's motivation behind blockchain, citing consumer protection. The appealing features are the immutability (single source of truth) and that it's democratic (all participants benefit). He also noted that while paper-based supply chains will need to invest in digitization to participate, overall cost is removed from the system. He also commented that without traceability to a definitive source, you can't conduct a root cause analysis.

Key Takeaway: FDA aims for traceability rule by 2022 and will be designated for "High Risk" foods.

In [Listeria monocytogenes and the Produce Industry](#), United's Jennifer McEntire highlighted the joint PMA-United Fresh Listeria workshops as an example of industry collaboration to increase awareness and education about the pathogen. PMA's Trevor Suslow provided detail around issues of sanitation and sanitary design, and the data that demonstrates areas for improvement including in packinghouses, noting that RACs can also be RTE. He identified efforts such as an HD summit and a GFSI technical workgroup for HD aimed at improving hygienic design. The effectiveness of sanitation is based on dose, time, temperature and mechanical force, and retraining based on data is critical. Neogen's Rob Donofrio discussed the product life cycle for new detection methods, including ideation, feasibility, optimization, pilot, scale, validation, and launch. He also detailed the process to validate a new method, which depends on the certifier, each of which specifies a different number of food categories, foods, assessment of false positives and false negatives, etc. He also briefly touched on the evaluation of lab competency.

A central theme in [Water Management in Food Manufacturing: Be Prepared for Problems](#) focused on the assessment of 'fit-for-purpose' water and its use in food production. Liesbeth Jacxsens of Ghent University described her study of open water sources around the E.U. to determine better microbial

action limits for irrigation water. As expected, results showed a variation in generic *E. coli* levels among different sources and types of storage units, while also finding a positive correlation between the presence of *Salmonella* in sources with high *E. coli* levels. Dr. Jaxsens also highlighted a resource titled [Washing of produce: Guidance to minimize the microbiological risk](#), developed by the Nestle Europe and the European Association of Fruit and Vegetable Processors, which may be of interest particularly to members who work internationally. Phyllis Posy of Atlantium Technologies described a recent study by Allaire et al., (2018) that evaluated national trends in drinking water violations, highlighting the importance of operations to ensure open communication with their municipalities, monitor their water quality reports, and consider conducting occasional verification samples of their water. Phyllis also noted upcoming webinars from the IAFP Water PDG that will be covering various water treatment technologies. In this and many of the other water-focused sessions throughout IAFP, per- and polyfluoroalkyl substances (PFAS) were highlighted as an emerging environmental chemical concern within water systems in the US.

Emily also attended some talks as part of [Technical Session 1 – Pre-harvest Food Safety and Produce](#), where students from the UDE and NC State presented their research on pathogen persistence and transfer in BSAAOs of poultry origins, and the use of vegetative buffer zones to reduce enteric pathogen transfer from animal operations to produce fields, respectively. In the BSAAO study at UDE, while *E. coli* showed greater persistence after 60 days in soils amended with raw poultry litter and heat-treated poultry litter pellets, greater transfer of *E. coli* to cucumbers was detected in the control plot which used inorganic fertilizer. In the NC State buffer zone study, manure, soil, air and produce were sampled for 10 months at three-week intervals. Select findings from the study included increased recovery of STEC from soil in warmer weather, and a difference in STEC in air samples depending on the type of animal operation (poultry or dairy).

During the first day’s lunch hour, Jennifer, Jill, and Trevor attended the second annual CPS luncheon, where members of the CPS technical committee met with a couple dozen academic and government researchers to share industry needs and practices that will help make research more applicable to the industry. Emily attended the regulatory session where FDA’s Frank Yiannas discussed “smarter food safety” and Mindy Brashears (USDA FSIS) mentioned the new initiatives to improve food safety in the meat and poultry industry.

[Applying lessons learned: keeping STEC off our lettuce](#), featured FDA’s Michelle Smith, who described FDA’s process for conducting an environmental assessment. FDA visited Yuma 3 times to support the environmental assessment and found that only a few of the 23 farms identified in the traceback applied overhead irrigation using the canal water that was positive for the pathogen. She also discussed FDA’s collaboration in the DelMarVa region. Mia Mattioli from CDC then discussed her agency’s role in analyzing water samples using dead end ultrafiltration. There are two steps to their investigation: the first phase focuses on where they would be most likely to find a positive; the second phase is on doing a root cause analysis if a positive is found. AZ LGMA’s Teresa Lopez discussed changes to the metrics that occurred post outbreaks, as well as numerous research and training initiatives that are still underway. She also reinforced one of Smith’s points, noting that Harrison Farm, implicated in the Yuma outbreak, was located 2 miles from the canal and did not use that water.

Key Takeaway: AZ LGMA is creating workshop trainings on the topics of root cause analysis and water quality treatment & monitoring.

In the panel discussion, “Is It Time for Food Safety Performance Standards Since Zero Risk is Not an Option?”, Angela Siemens (Cargill Meat Solutions) made the point that in many cases, FDA’s zero tolerance policies do not provide regulatory advantages to production practices such as high-pressure processing, that may reduce pathogens and ultimately lower risk, but is not sufficient as a kill step. Donna Garren of AFFI similarly agreed that zero tolerance disincentivizes a ‘seek and destroy’ attitude for *Listeria* environmental monitoring programs, particularly when it comes to Zone 1 testing. However, each of the panelists agreed that a major hurdle towards defining food safety performance standards for the food industry is the determination of ‘how safe is safe enough?’, given the variation in dose-response relationships for certain pathogens.

Jennifer participated in a round table discussion on [Cyclospora: it’s not just an imports issue](#), along with Mike Osterholm (UMinn), Samir Assar (FDA), Walter Ram (Guimarra) and Trisha Robinson (MN Dept Health). The conversation focused on our limited understanding of the life cycle of the pathogen, and how this challenges our ability to assess effective mitigation strategies. The session highlighted that the organism is a parasite, not a bacterium, and is generally not susceptible to antimicrobials and other interventions that are effective against vegetative pathogens like *Salmonella* and *E. coli*. It also noted that while humans are the only host for the parasite, research suggests that direct fecal-oral contamination does not occur, since the pathogen requires 1-2 weeks outside the host, in the environment, to mature to its infective form.

At the same time, Emily attended the session on [Utilization of Metagenomics Technologies to Enhance Produce Safety and Quality](#). Maria Brandl (USDA ARS) presented some of their findings on the overall microbiome and *E. coli* growth in lettuce varieties with varying shelf-lives. She noted that *E. coli* growth increases around lesions on a lettuce head as well as in areas of mechanical injury, and that overall growth may differ depending on if the decay is physiological or microbial. Regarding the samples’ microbiomes, species richness greatly decreased over shelf, with the poorer shelf life lettuce shifting towards *Erwinia* and *Enterobacteriaceae*. In general, lettuce microbiomes were also found to differ significantly depending on the production practices and CO2 levels during storage.

Monday evening the Produce Safety Alliance (PSA) hosted a special session to provide updates on their training progress and key changes for educators. The PSA has funding to continue with these initiatives through 2020. Grower trainings will now use the updated version 1.2 of the training manual. All resources discussed in this session can be located at the [PSA website](#). Samir Assar with FDA also issued a brief update. He stated that FDA plans to issue water subpart E by 2022.

Key Takeaway: Produce farms that are exempt from FSMA need to be keeping sales documents now, to prove exemption.

Emily was a speaker in [Advancing the science of risk-based criteria for ag water quality](#). Emily opened by describing the current PSR ag water requirements, the challenges with it, the LGMA water metrics, and the approach United Fresh supports to help growers comply with the Harmonized Standard’s requirement to assess the risk of water quality. Don Schaffner (Rutgers) discussed the concept of risk and referenced Ari Havelaars study (UFL) demonstrating that to know the “true” quality of ag water,

more samples (at least 20) should be taken. U of AZ's Channah Rock showed how the quantitative microbial risk assessment related to ag water (funded by CPS) compares to the actual number of illnesses in the Yuma outbreak.

Key Takeaway: There is no such thing as "Safe". There is "safer" and "less risk".

Emily also was a panelist in a round table on [Application of high-throughput sequencing by industry: potential, barriers, and opportunities](#), along with Eric Brown (FDA), Balasubramanian Ganesan (Mars), Sanjay Gummalla (AFFI), Behzad Imanian (IFSH), and Fabien Robert (Nestle). The session highlighted challenges with implementing WGS technology within the panelists' respective industries, with education and regulatory risk highlighted as remaining barriers. Eric Brown (FDA) discussed the use of WGS within the outbreak investigation process, and remarked that the FDA's GenomeTrakr database recently surpassed 400,000 isolated sequences. He also mentioned that the ability for WGS to confidently exclude a farm or organization from an outbreak is a benefit that often goes unnoticed. Outside of outbreak investigations, discussions turned to other benefits of WGS, such as the ability to understand the soil and produce microbiome, and how those learnings may help us better understand contamination risk in the growing environment. A central theme within the discussion was that WGS is here to stay, and producers should continue exploring the ways in which the technology could benefit their industry.

Another session focused on [Agricultural water and emerging pathogens in the age of FSMA: do we need to worry](#). Kali Kniel (UDE) discussed the CONSERVE project, with is a multi-university group looking at nontraditional water from a safety standpoint, as well as an economic/marketability standpoint. She shared data on various water sources (pond, river, reclaimed, and produce wash) and the levels of Cryptosporidium, Cyclospora, Giardia and Toxoplasma and viruses in them. She also discussed the exploration of indicator organisms. Chuck Gerba (UAZ) talked about ag water standards relative to protozoa and viruses and provided the history of how various metrics were established. Jim Brennan (Smartwash Solutions) concluded the session by sharing how Taylor Farms assessed a growing operation for Cyclospora, noting the incredible difficulty in detecting the organism, the structural changes that they implemented to reduce risk, and the healthcare programs that they support to suppress infection in the community.

In the session, [Novel and Emerging Technologies for Improving Sanitation](#), Julie Goddard (Cornell) discussed new technologies that improve cleaning food contact surfaces. This talk was followed by Dale Grinstead (Diversey) who took a different approach to biofilms. Most research is on biofilm prevention, but his talk focused on chemicals to use to remove the biofilm once its established. This session was completed with a talk by Sima Hussein (Ecolab) who focused on best practices for training the sanitation team.

Key Takeaway: Millennials receive information in small doses. Adapt your training to accommodate how Millennials learn for more effective training.