United Fresh Produce Association
Food Safety & Technology Council Meeting

La Quinta Resort & Club, La Quinta, California
Wednesday, January 13, 2016

Draft Minutes

Council Members Present:

Suresh DeCosta, McDonalds, Chair
Felice Arboisiere, Taco Bell
Megan Arnold, Robinson Fresh
Tony Banegas, ReadyPac Foods
DeAnn Benesh, 3M Food Safety
Rod Bernard, Southern Specialties
Sally Blackman, CPMA
Jeffrey Brandenburg, The JSB Group
Jim Brennan, SmartWash Solutions
Donna Lynn Browne, Naturipe Farms
James Cranney, CA Citrus Quality Council
Jill Dunlop, FFVA
Bob Elliott, Sunkist Growers
Lisa Fuentes, Driscoll's
Tom Gautreaux, Maxwell Chase Technologies
Scott Grow, G.O. Fresh
Melissa Herbert, Neogen Corporation
Michael Jantschke, PRO*ACT
Lianna Kelly, Markon
Justin Kerr, Factor IV Solutions
Andrew Kesler, Taylor Fresh Foods
Karan Khurana, Pulse Instruments
Guy Latreille, Veg Pro International
Eva Lee, Raley's Family of Fine Stores
Tom Lovelace, McEntire Produce
Yaguang (Sunny) Luo, USDA ARS
Drew McDonald, Church Brothers
Bob Mills, The Harbinger Group
Gurmail Mudahar, Tanimura & Antle
Gail Murray, Disney Consumer Products
Bill Pool, Wegmans Food Markets
Gale Prince, Your Food Safety Coach
Jeanne Raede, Food Safety Results
Walter Ram, The Giumarra Companies
Joan Rosen, JC Rosen Resources
Aaron Schneider, Dole Fresh Vegetables
Marshall Sherman, Walter P. Rawl & Sons
Joe Stout, Commercial Food Sanitation
Trevor Suslow, University of California Davis
Richard Varley, KiVar Chemical Technologies
Milton Voss, B & W Quality Growers
Bob Whitaker, Produce Marketing Association
Kate Woods, Northwest Horticultural Council
Bob Ziel, McEntire Produce
Brian Zomorodi, Apio

United Fresh Staff:
David Durkin, OFW Law
David Gombas
Erin Grether

Guests:
Barry Eisenberg, BASF
Rudi Groppe, Heinzen
Toni Hoefer, Raley's Family of Fine Stores
Karen Holden, Avendra
Steve Kenfield, HMC Farms
Cody Lawrence, Dow Chemical
Allison Moore, FPAA
Donna Pahl, Produce Safety Alliance
Blane Sely, Dole
Emily Smith, Smith Packing
Luciana Soler-Smith, Dole
Leonardo Tarriba, Farmer's Best
Ed Thompson, Avendra
Ross Wileman, Mission Produce
Ian Williams, CDC
W. Kent Wise, ReadyPac Foods
Sayandro Yersteylen, Paper Pak Industries

Council Members Absent:
Walt Armijo, Lighthouse FS&Q
Stanley Bailey, bioMerieux Industry, USA
Geri Barone, Professional Food Safety
Ed Beckman, Live Oak Farms
Austin Bernard, Chick-fil-A
Ian Bessell, Covance
Samantha Bierschwale, Lipman
Michael Bledsoe, Village Farms
Daniel Botts, FFVA
Barbara Braden, organicgirl
Hap Carr, Titan Farms
Megan Chedwick, Church Brothers
Chris Christian, CA Strawberry Commission
Tom Daniel, Sterilox Fresh
Jeff Dolan, DiMare Fresh Newman
Gray Drohan, Junction Solutions
Amy Duda-Kinder, A. Duda & Sons
Hari Dwivedi, bioMerieux Industry USA

Chris Dzuik, H-E-B
Cheryl Enlow, Renaissance Food Group
Thea Eubanks, organicgirl
Harold Ewell, N2N Global
Ebrahim Firoozabady, Del Monte Fresh
Steve Foster, Wholesale Produce Supply Co.
Micah Fuson, Apio
Hank Giclas, Western Growers
James Gorny, Produce Marketing Association
Laura Grunenfelder, Northwest Hort. Council
John Gurrisi, Fresh Express
Valerie Hannig, The Oppenheimer Group
Margaret Hardin, IEH Laboratories
Heidi Hau, Ecolab
John Headrick, Monsanto
Peter Hill, Alpine Fresh
Grace Ho, Misionero Vegetables
Scott Horsfall, California LGMA
William Hurst, University of Georgia
Lance Jungmeyer, FPAA
Beverly Kempf, Club Chef
Jeanna Kilmer, Silliker
Ozgur Koc, Crunch Pak
John Kolenski, The Kroger Company
Greg Komar, NSF Agriculture
Mahipal Kunduru, McDonald's Corporation
Sharan Lanini, Fresh Express
Jorge Leyva, MexBest
Jim Llano, Castle Rock Vineyards
Amanda May, Wonderful Citrus
Graham Mendes, Alchemy Systems LP
Michael Menes, True Organic Products
Clarisa Molina, Ser-Ka Solutions
Bob Morrissey, National Watermelon Assoc.
Jonathan Needham, GLOBALG.A.P NA
Jerry Noland, Safeway
Beth Oleson, GFVGA
Elis Owens, Birko
Tracy Parnell, Bolthouse Farms
Heena Patel, SCS Global Services
Joshua Porbeni, Club Chef
Keith Refsnider, Driscoll's
Eric Ritchie, McCain Foods USA
Michael Roberson, Publix Super Markets
Mansour Samadpour, IEH Laboratories
Sam Schlagetter, Freshway Foods
Mark Seetin, U.S. Apple Association
Gurjit Shergill, Taylor Farms
Nancy Shimabukuro, Walter P. Rawl & Sons
Rashmi Singh, Peri & Sons Farms
Kim Snyder, Monterey Mushrooms
Tabitha Sparks, Lakeside Produce Distribution
Stacy Stoltenberg, Dupont Qualicon
Lori Tansey, Chiquita Brands International
Hilary Thesmar, Food Marketing Institute
Steve Tripp, Pacific International Marketing
Angela Valadez, Publix Super Markets
Tony Valenzuela, Naturipe Berry Growers
Mike Villaneva, California LGMA
Jon Wall, North Bay Produce
Thomas Young, Food Defend
Zach Young, Target Corporation

I. Meeting Called to Order

Council Chair Suresh DeCosta welcomed the attendees and asked for self-introductions. The Council was reminded of the United Fresh antitrust guidelines. The Council approved the minutes of the September 28, 2015 Council meeting without change. The agenda was approved without change.

II. Produce Safety Alliance Curriculum Preview

Donna Pahl, Produce Safety Alliance, briefed the Council on the Alliance's progress in developing the FDA-recognized curriculum. The Alliance was established in 2010 through a Cooperative Agreement between Cornell University, FDA and USDA. Its primary goals are to develop a standardized educational curriculum to increase understanding of produce safety, build national networks of produce safety subject matter experts, train trainers to build a cadre of qualified instructors, conduct trainings to assist growers with meeting regulatory requirements, and collaborate to support international training. Pahl reminded the Council that the Produce Safety rule requires that at least one supervisor from each farm must complete food safety training at least equivalent to the standardized curriculum recognized by the FDA.

In its present form, the curriculum includes seven one-hour modules in one day, covering the following topics:

- Introduction to Produce Safety
- Worker Health, Hygiene, and Training
- Soil Amendments
- Wildlife, Domestic Animals, & Land Use
- Water: Production and Postharvest Water
- Postharvest Handling and Sanitation
- How to Develop a Farm Food Safety Plan

Participants who complete the course will receive a certificate from the Association of Food and Drug Officials (AFDO) indicating that they completed the training.

Pahl described some of the challenges to implementation that the Alliance has faced: identifying and mentoring qualified trainers, reaching growers (particularly those who are uninformed or are reluctant because of concerns of government overreach), and overcoming limited funds for growers and trainers.

Pahl provided a preview of some of the slides to be used in the course modules. Some slides will include the '§' symbol to indicate a specific Produce Safety rule requirement is presented on the slide or referred to in the slide notes. She noted that every training must have at least one PSA Lead Trainer present. She also described the process of becoming a Lead Trainer: those who apply must come with knowledge and experience in the areas of microbiology, produce production, training experience and knowledge of FSMA; they must attend the 2-day Train-the-Trainer Course; and they must successfully complete an interview, conducted by content experts, that will involve questions and produce safety scenarios so that the applicant can demonstrate knowledge.

III. Food Safety Innovations and Preventive Controls during Fresh-cut Produce Washing and Retail Display

Sunny Luo provided a final report on USDA Specialty Crops Initiative-funded research her team of researchers from ARS and seven universities have conducted over the past few years. The primary goals of the research were 1) reducing pathogen population and preventing cross-contamination through optimization of produce wash system design and operation, and development of innovative washing processes and technologies, and 2) preventing pathogen proliferation in the supply chain, especially at retail.

Luo noted that, prior to 2010, 1 ppm of free chlorine was used as a HACCP "Control Limit", and rewashing as the "Corrective Action". Responding to a request from a Council member, her team looked into this issue and demonstrated that rewashing freshly contaminated produce can reduce the pathogen population by about 90%, but can't eliminate its presence. She presented data demonstrating no *E. coli* O157:H7 survival in solution at or above a free chlorine level of 5 ppm, and no pathogen cross-contamination on fresh-cut lettuce at or above a free chlorine level of 10 ppm, but 1 ppm permitted detectable cross-contamination and survival for short periods. She noted that cross-contamination in water is a dynamic process, and is dependent on real time free chlorine levels. As the localized chlorine level drops below 10 ppm, the potential for cross-contamination increases and can occur in seconds. Her team developed a microfluidic device for evaluating chlorine dose-time response on pathogen inactivation in that short a time. With that tool, she demonstrated that 10 ppm can inactivate 5 logs of *E. coli* O157:H7 in about 0.2 seconds, while 1 ppm requires 1.0 seconds to inactivate 5 logs. She reminded the Council of the

industry-wide effort led by FDA/IFSH to develop a white paper on validating antimicrobial washes as preventive controls for fresh-cut leafy vegetables; this research will be referred to in that paper in identifying the chlorine concentration that is necessary and sufficient to prevent pathogen cross-contamination during commercial fresh-cut produce wash operation.

Luo reported findings on their research into the role of organic loading on pathogen inactivation. Their data demonstrate that wash water with higher organic load does not necessarily require higher free chlorine concentration to inactivate pathogens, but it does require a higher chlorine dosing rate to reach the target free chlorine concentration. She highlighted the importance for researchers to report the actual free chlorine concentration in the solution (after its reaction with organic materials), more than just the free chlorine concentration that they intend to make. She also demonstrated a chlorine-dosing program that could enable the transformation of chlorine control from feedback to feed forward.

A final objective of their project was research into developing a cost-effective approach to improving food safety at retail through better temperature control. She demonstrated that retrofitting open display cases with doors provided better temperature control: fresh-cut packages in the front were in compliance with Food Code standards while product in the back remained above freezing. Products had longer shelf-life and better quality appearance than product in open display cases. She also demonstrated that such retrofitting would yield significant energy savings, resulting in a retrofit return-on-investment within two years based on energy savings alone.

IV. Listeria Discussion

Bob Whitaker described activities to be undertaken jointly by United Fresh and PMA to help the industry deal with *L. monocytogenes* (Lm). Recent recalls and outbreaks linked to produce have raised awareness in packing operations and focused efforts on sanitation and sanitary design. The listeriosis outbreak linked to Blue Bell ice cream raises doubts about the level of Lm needed to cause illness, and the recall and possible illness lined to Lm-contaminated peaches suggest Lm is a hazard that must be considered by acid fruit handlers too. Current wisdom is that, if there is moisture in the produce handling environment, even occasionally (e.g., equipment or facility washing), the operation may be vulnerable to Lm entrenchment. Going forward, it is important for the produce industry to speak with one voice in how Lm risks are best handled. Whitaker outlined a three-prong approach.

First, Lm regulatory policy. United Fresh and PMA are participating in the Alliance for Listeriosis Prevention, a coalition of association and company representatives, to share experiences within food industry and find opportunities for collaboration. The Alliance has strong working relationships with FDA, USDA FSIS and the Canadian food regulatory agencies. The Alliance's current focus is making sure FDA develops Lm guidance that is science based and provides industry with a path forward that encourages companies to develop effective environmental monitoring and mitigation practices. United Fresh and PMA intend to jointly develop and submit comments to FDA's revised *Listeria* guidelines, when they are published, potentially later this year.

Second, equipment design and sanitation practices. The Council's *Listeria* guidelines already identifies risk factors in the produce handling environment and recommendations for environmental monitoring and control. However, United Fresh and PMA agree that two target audiences warrant development of additional educational tools: equipment manufacturers and facility designers, and decision makers of facility capital purchases. The

former need to understand how their designs can create or minimize Lm risks, encourage them to develop and offer equipment with reduced Lm risk, and develop retrofit solutions for existing equipment. The latter need to understand the risk side of facility designs and equipment purchases that are less expensive but introduce additional Lm risk. He encouraged formation of a joint task force from the PMA and United Fresh science committees to inform the content and delivery of these educational tools.

Finally, research. Considerable research on controlling Lm has already been done in the food industry, which raises the question: is the issue a lack of knowledge or lack of adherence to best practices? Whitaker suggested that PMA and United Fresh convene experts to perform a gap analysis to identify the researchable questions limiting our ability to deal with Lm, then share the outcomes with research funding agencies and the Center for Produce Safety.

V. Avocado Food Safety

Trevor Suslow reported on an avocado *Listeria* risk assessment his team performed in 2014 and 2015. In a summary of research outcomes, he reported that Lm and Salmonella demonstrate a slow decline or stable populations on intact avocado rinds during short-term storage at temperatures ranging from 41º to 57ºF. He found no evidence for growth on rind, no evidence for growth during ethylene conditioning, and no evidence for sub-rind transfer, even with shifts in storage temperature. However, they did detect that internalization may occur if the rind is wounded, has expanded lenticels, or during immersion hydrocooling. He also presented data demonstrating the potential for *Salmonella* and Lm cross-contamination from surface contaminated avocados during immersion hydrocooling at 5 ppm free chlorine levels; 15 ppm free chlorine showed some level of control. His data and photos demonstrating increased water uptake and pathogen infiltration of snap-harvested (stem off) avocados compared to clip-harvested (stem on) during immersion hydrocooling.

FDA's Preventive Controls for Human Food rule puts added emphasis on environmental monitoring programs (EMP), especially for Lm, in operations handling exposed foods that have no terminal kill step, such as fresh and fresh-cut produce. Suslow noted that isolates from environmental investigations are being used for facility-mapping to better define persistence, dispersal, and to prioritize sanitation master schedules and EMP efforts.

VI. Evolution of an Epidemiological Investigation

Ian Williams, CDC, led the Council through a table top exercise to understand the approach used by CDC and other public health partners in multistate foodborne disease outbreak investigations. He reminded the Council that, because of inherent delays, it may be 2-3 weeks after a person is exposed to a pathogen before epidemiologists are aware of the illness and can interview the patient about what they may have been exposed to. He also reminded the Council that most outbreaks are first detected, and investigated, by county and state investigators, and that CDC and FDA may only become involved in multistate outbreaks. But he also noted that PulseNet has improved agencies' ability to detect and link illnesses to a common exposure or vehicle.

The exercise involved a mock multistate foodborne disease outbreak of *Salmonella* Typhimurium infections. In the first phase (outbreak detection), PulseNet detects a cluster of infections with PFGE patterns that are indistinguishable. The first activity is to determine if the number of cases is unusually high compared with historical data, since there is usually

a background number of illnesses that are never linked to outbreaks. They also review case patient demographics and clinical information (e.g., age and gender, severity of infections) and the geographic spread of the infections (how many illnesses and in which states).

If it appears that the infections may be part of an outbreak, CDC will request States to send any patient interview data collected to CDC and to begin interviewing patients using a "standard elements" questionnaire that includes about 300 questions such as exposure to certain foods (e.g., ground beef, unpasteurized milk and dairy, leafy greens, sprouts, tomatoes), animal contact, shopping and eating locations, and travel history. Breaks in the investigation often rely on discovering patient clusters, i.e., more than one unrelated ill person (i.e., they do not know or live with each other) who report eating at the same restaurant location, attending a common event, or shopping at the same location of a grocery store before becoming ill. If a cluster appears, investigators may re-interview patients to ask if they were also exposed to whatever the cluster patients may have been exposed to, especially if the item is a minor ingredient in another food (e.g., sprouts on a sandwich).

If a food is suspected as the likely source, FDA and state investigators then begin a traceback to determine if there is a point of convergence in the supply chain. Often this is based on information provided in invoices supplied by the point of sale where patients were apparently exposed to the food. If a point of convergence is revealed, FDA will initiate an investigation to try to identify how the food became contaminated. If the food is still in commercial distribution or may be in consumers' homes, FDA will likely request the operation perform a recall.

Williams noted that CDC and FDA do not always communicate these investigations to the public. Generally, the public is informed when a specific source has been identified AND public can take action. Some other reasons for publishing information about an outbreak include: illness cases are increasing rapidly (an ongoing outbreak); there is a high-risk group involved; there have been deaths or a high hospitalization rate; the pathogen severity is high; there is already high media interest; or if misinformation is being circulated. He noted that, in 2015, over 200 multistate clusters were investigated by CDC and only 14 outbreaks were communicated publicly.

Finally, Williams emphasized that there are three major pillars of evidence to be considered in evaluating source(s) of contamination: 1) Epidemiologic evidence - data from interviews of ill persons, distribution of cases in person/place/time, results of analytic epidemiologic studies, history of pathogen and past outbreaks; 2) Evidence from a traceback of a suspected vehicle linked with ill persons to identify a common point where contamination may have occurred and an assessment of the production facility at that common point; and 3) Laboratory results from testing of a suspected vehicle or the production facility where contamination may have occurred. CDC does not always get all three, but evidence from each pillar is evaluated in concert to determine if data support the conclusion that a suspect food is the cause of the outbreak.

VII. What Have You Heard?

A regular agenda item, Council members shared information that may be of general interest:

- United Fresh members have developed fresh-cut food safety models to be used in FSPCA Preventive Controls Qualified Individual training courses. The models have been reviewed by FSPCA and FDA, and will be donated to FSPCA for future courses.
- United Fresh and PMA are collaborating on Responsible Labor Practices guidelines for the produce industry. There are no plans to develop an audit standard.
- David Durkin confirmed that he is working on the next iteration of guidance on FDA inspections, updated with the new FDA rights and operations' responsibilities from FSMA and FDA regulations.
- California leafy greens companies are dealing with a California Department of Public Health concern with cadmium levels in California-grown leafy greens. It is expected that the industry will respond with additions to the LGMA standards.
- Hartnell College is offering its sanitation course for the produce industry.
- A Recall Ready workshop was presented at McDonald's Hamburger University in December and was well attended and received.
- Gombas confirmed that this was his last Food Safety & Technology Council meeting. He thanked the Council for its years of support to him and the fresh produce industry.

VIII. Next Meeting

The next scheduled meeting of the Council will be Monday, June 20, 2016 at the McCormick Center, Chicago, during the annual United Fresh convention.

Having reached the end of the agenda, the meeting was adjourned.