



Salmonella Contamination Delmarva Produce

Kathleen F. Gensheimer, Office of Foods and Veterinary Medicine, FDA





Previous Delmarva Outbreaks

<u>Year</u>	<u>Serovar</u>	<u>Cases/States</u>	<u>Hosp</u>	<u>Vehicle</u>
2002	S. Newport*	333/24	43	red round tomato
2005	S. Newport*	72/16	8	red round tomato
2006	S. Newport*[%]	115/19	37	red round tomato
2007	S. Newport*	65/18	11	red round tomato
2010	S. Newport*^{%%}	51		tomato
2014	S. Newport *	275/29	47	cucumbers
	S. Javiana	78/11	28	unconfirmed
2015	S. Newport	83/1	15	tomato

[Outbreak of Salmonella Newport Infections Linked to Cucumbers — United States, 2014](#) , Kristina M. Angelo, DO, Alvina Chu, MHS, Madhu An and, MPH, et al. *MMWR Morb Mortal Wkly Rep* 2015;64:144-7

Multistate foodborne disease outbreaks associated with raw tomatoes, United States, 1990–2010: a recurring public health problem

S. D. Bennett, K. W. Littrell, T. A. Hill, M. Mahovic and C. Barton Behravesh. *Epidemiology and Infection*
DOI: <http://dx.doi.org/10.1017/S0950268814002167>

- ***Same PFGE “pattern 61”**
- **%Linked by PFGE**
- **\$Linked by whole-genome sequencing**

The Problem of Investigating Fresh Produce Outbreaks

- Widely dispersed, individual patient-cases in many states
- Low attack rates, epidemiology is tedious
- Trace-back investigations are difficult due to complexity of the supply chain
- Intermittent, low-level contamination
- Implicated produce is rarely still available, the crop is no longer in the field



Key Conclusions from VA surveys

- Sampled Areas:
 - Virginia Tech Agricultural Research and Education Center (AREC): 2009-2011
 - 6 environmental waters and sediments: 2011, 2012, 2014-2015
 - Roadside stand tomatoes: 2010-2011
- *Salmonella* Pattern 61 and other clinically relevant isolates found consistently in waters and sediments at Virginia Tech Agricultural Research and Education Center and the 6 other locations
- Environmental waters and sediments are potential reservoirs for *Salmonella*
- Unclear mechanism(s) by which *Salmonella* introduced in to or on to crop plants



Next Steps

- Proactive surveillance for cases S. Newport 061 utilizing standardized questionnaire
- Traceback(s) to identify common source/supplier
- WGS clinical/environmental/food isolates
- Environmental Assessment

Preventive Approach

- Collaborate stakeholders:
 - Characterize problem context Delmarva produce landscape
 - Address problem:
 - **ensuring stakeholders aware repeated outbreaks; evolving state knowledge/data gaps; need collaborative regional effort to develop suggestions/possible next steps based on solid science**