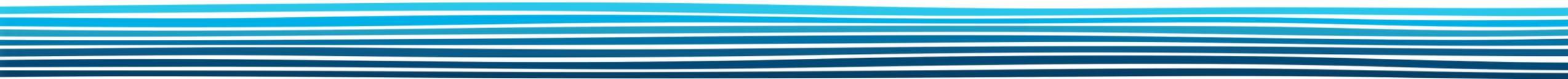


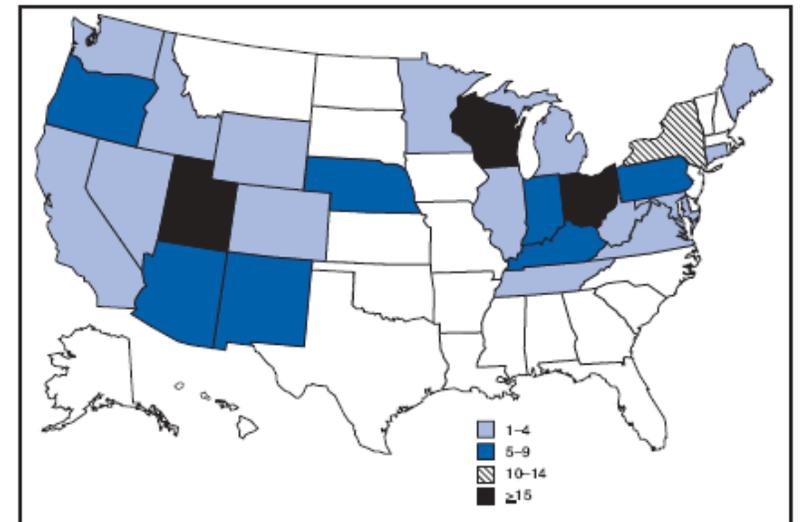
Previous Outbreaks Related to Preharvest Agricultural Water



Spinach, *E. coli* O157:H7, 2006

- 199 illnesses, 141 hospitalizations, 31 cases of Hemolytic Uremic Syndrome (HUS), 3 deaths
- Outbreak strain was found in river water, cattle feces, and wild-pig feces
- Changes in groundwater levels during growing season - levels were higher than the San Benito riverbed

FIGURE 1. Number of confirmed cases (N = 183)* of *Escherichia coli* serotype O157:H7 infection, by state — United States, September 2006



* Confirmed cases reported as of 1:00 p.m. EDT on September 26, 2006.

Spinach – Aftermath

- Widespread adoption of Good Agricultural Practices
- Creation of the California Leafy Greens Marketing Agreement in 2007
- Influenced the development of the Produce Safety Rule



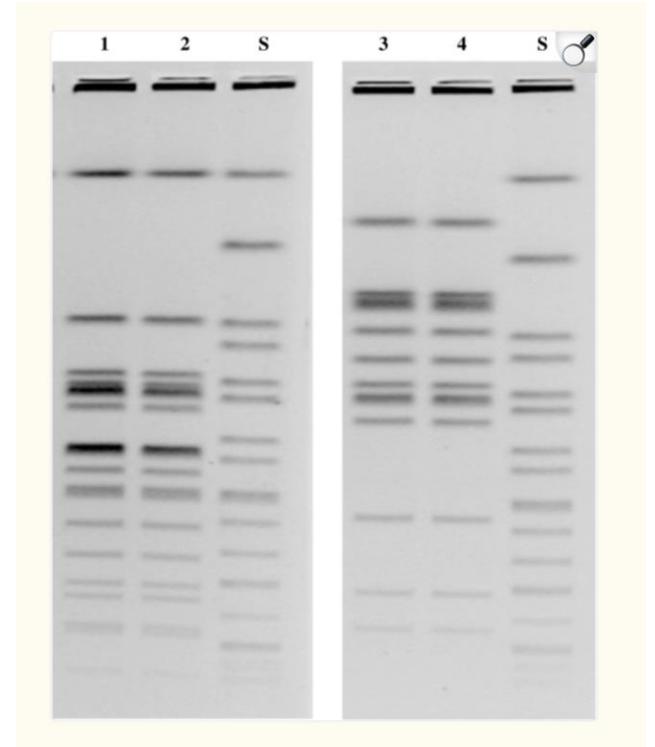
Tomatoes, *Salmonella*

- 2002 – 2007: 11 salmonellosis outbreaks associated with tomatoes
- 4 were linked to the Delmarva Peninsula
 - 2002 and 2005 outbreaks a common serotype, PFGE pattern, geographical distribution of case-patients



Tomatoes, *Salmonella* – Outbreak Investigation

- One particular *S. Newport* subtype, PFGE XbaI pattern JJPX01.0061, has recurred in 2002, 2005, 2006, and 2010
- Outbreak-related and additional strains of *Salmonella* were consistently found in surface water and sediment from implicated farms.
- Bird feces also tested positive for *Salmonella*

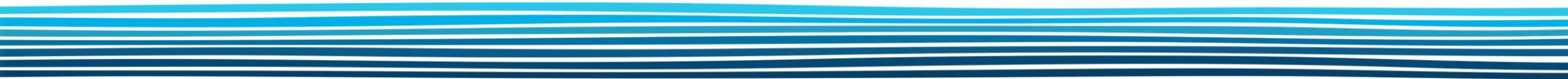


Tomatoes, *Salmonella* – Aftermath

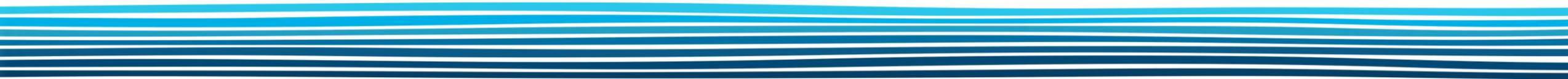
- FDA and VT AREC Research Studies – Team Tomato
- Delmarva Peninsula = *Salmonella* hot spot?
 - Persistent source of environmental contamination
 - Proximity to Poultry Operations
 - Well vs Surface water



Romaine Lettuce, *E. coli* O157:H7, Fall 2018

- 62 illnesses, 25 hospitalizations, 2 cases of hemolytic uremic syndrome (HUS), 0 deaths
 - Isolates from ill consumers had a rare genetic fingerprint that was closely related to one previously seen in ill consumers in the Fall of 2016 and the Fall of 2017.
 - No food vehicle was conclusively identified, leafy greens – and romaine lettuce in particular – were the suspect food vehicle
- 

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Romaine Lettuce – Outbreak Investigation

- The outbreak strain was identified in one sample of sediment from an on-farm water reservoir
 - FDA has concluded that the water from the on-farm water reservoir where the outbreak strain was found most likely led to contamination
 - The outbreak strain may have either persisted in the environment or may have been repeatedly introduced into the environment from an unknown source
- 