Multistate Salmonellosis Outbreaks in 2018

Matthew Wise, MPH, PhD
Outbreak Response and Prevention Branch
Division of Foodborne, Waterborne, and Environmental Diseases

October 2018
USAHA Committee on Salmonella
Multistate Salmonellosis Outbreaks in 2018: A Busy Year

- Two linked to chicken consumption (I 4,[5]), 12:i:- and Infantis
- Two linked to shell egg consumption (Braenderup and Enteritidis)
- Two linked to coconut products (one dried and frozen, shredded)
- Pasta salad sold at a single grocery chain (Sandiego and IIIb)
- Chicken salad sold at a single grocery chain (Typhimurium)
- Pre-cut melon sold at grocery stores (Adelaide)
- Multiple turkey products including ground, whole, and raw pet food (Reading)
- Ground beef (Newport)
- Raw sprouts (Montevideo)
- Breakfast cereal (Mbandaka)
- Kratom (multiple serotypes)
- Contact with backyard poultry (multiple serotypes)
- Contact with guinea pigs (Enteritidis)
Theme 1: Numerous Outbreaks Linked to Meat and Poultry Products

- **Examples:**
  - Chicken consumption (I 4, [5], 12:i:- and Infantis)
  - Multiple turkey products including ground, whole, and raw pet food (Reading)
  - Ground beef (Newport)

- **Unclear whether this is a trend or just an unusual year**
  - Several of these leveraged WGS
Theme 2: Atypical “Outbreaks”

- Examples:
  - Chicken/Infantis
  - Turkey/Reading
  - Ground beef/Newport
  - Kratom/multiple serotypes
Theme 2: *Salmonella* Infantis Linked to Chicken Products

- Illnesses over an 8-month period
- Linked to numerous chicken products, including raw chicken pet food
- Outbreak strain isolated from people, chicken meat, chicken pet food, and live chickens
- Exhibited multidrug resistance
Theme 2: *Salmonella* Reading Linked to Turkey Products

- Illnesses over an 9-month period
- Linked to numerous turkey products, including raw turkey pet food
- Outbreak strain isolated from people, turkey meat, turkey pet food, and live turkeys
- Exhibited multidrug resistance
Theme 2: Multiple *Salmonella* Serotypes Linked to Kratom

- Illnesses over an 18 month period
- Multiple serotypes... the more testing the more was found
  - Highly contaminated
Theme 2: *Salmonella* Newport Linked to Ground Beef

- Identical strain (by WGS) that caused at 2016-2017 outbreak
  - Illnesses over a 10-month period linked to ground beef
  - Outbreak strain found in 4 dairy cattle from a single state and ground beef collected from an ill person’s home
  - Traceback of ground beef did not go to a single slaughter facility
  - Root cause not identified
Theme 3: Several “Repeat Offender” Outbreaks

- Examples:
  - Two linked to chicken consumption (I 4,[5]),12:i:- and Infantis)
  - Raw sprouts (Montevideo)
  - Pre-cut melon sold at grocery stores (Adelaide)
  - Contact with backyard poultry (multiple serotypes)

Food Vehicles for Multistate Salmonellosis Outbreaks, 2009-2016

- Fruits 18%
- Seeded Vegetables 16%
- Sprouts 13%
- Nuts-Sea 12%
- Chicken 8%
- Beef 7%
- Vegetable Row Crops 5%
Theme 4: Pre-Made Items Sold at Grocery Stores with Multiple Ingredients

- **Examples:**
  - Pre-cut melon sold at grocery stores (Adelaide)
  - Pasta salad sold at a single grocery chain (San Diego and IIIb)
  - Chicken salad sold at a single grocery chain (Typhimurium)

- **Very difficult to determine the source of contamination**
  - Ingredient?
  - Contamination in the processing facility?
Looking Ahead
Full Implementation of WGS in PulseNet

- PulseNet switch from PFGE to WGS will occur in early 2019
  - Nearly all *Salmonella* will be sequenced
  - PFGE will be rapidly phased out

- This will require shifts in:
  - How outbreaks are detected, defined, and investigated
  - The current processes for interagency and interdisciplinary collaboration

- Will likely lead to finding more outbreaks
  - Many outbreaks may be easier to solve with WGS
  - WGS will also uncover complex connections throughout the food system that may be difficult to explain or understand without more collaboration
No Change in Incidence of Salmonellosis Since 1996
Outbreaks Are a Small Fraction of All Illness

- Only about 12% of illnesses reported to PulseNet are associated with a potential multistate outbreak.

- Do the atypical outbreaks we’re now seeing provide insights that could help us reduce *Salmonella* incidence overall?
Questions?