Indiana and Michigan Salmonella Adelaide Melon Investigation Outbreak Successes and Challenges

Katie Arends, MPH
Michigan Department of Health and Human Services

Cerisé Hardy, MPH
FDA/CORE Post-Response

Stanley Danao, IN RRT Food Specialist
ISDH Food Protection Program
People infected with the outbreak strain of *Salmonella* Adelaide, by state of residence, as of July 24, 2018 (n=77)

Source: [https://www.cdc.gov/salmonella/adelaide-06-18/epi.html](https://www.cdc.gov/salmonella/adelaide-06-18/epi.html)
Observations on Day 1 in Michigan

• Thursday 5/24/18: Lab reports 11 isolates of Salmonella Adelaide
• 12 cases (11 PFGE matches, 1 epi-linked) from 7 local jurisdictions
  • 10/12 already interviewed with routine case investigation form

• Notable characteristics:
  • Onset dates 4/30, 5/9-5/17
  • Age distribution
  • Exposures of interest: fresh fruit (including melons), peanut butter, smoothies/protein shakes, supplements; 1 case “98% vegan,” 1 case liquid/soft diet
  • Cases in nearby states
  • Common grocery chain (8 cases)
Age Distribution

[All *Salmonella*]

Median age: 34

[S. Adelaide 1805MITDA-1]

Median age: 67
Early Investigation Strategies

• Communication with other states, CDC
  • Cluster code assigned on Day 1, exposure data in SEDRIC
• National Hypothesis Generating Questionnaire (NHGQ)
  • Proactive administration to new Salmonellosis cases in outbreak jurisdictions
• OutbreakNet Enhanced student interview team
  • 8/12 cases from participating jurisdictions
• Shopper card data requests
  • First request submitted on Day 2 (6 shopper cards)
• Enhanced laboratory surveillance (preliminary results)
• Venue-based subcluster identified: 4/8 group meal attendees ill
CORE Signals contacted CDC on 5/29/2018, regarding a newly identified *Salmonella* Adelaide cluster with a strong epidemiological signal for pre-cut melon purchased at chain grocery stores.

People infected with the outbreak strain of *Salmonella* Adelaide, by date of illness onset:

* *n* = 77 for whom information was reported as of July 24, 2018. Some illness onset dates have been estimated from other reported information.
Michigan and Indiana Sampling Activities

• Due to the rapid expansion and severity of the cases, the CDC requested that states begin sampling of cut melons at the implicated retail grocers.

• Both Michigan and Indiana decided to collect and analyze cut and whole melon samples from implicated retail facilities.

• Michigan and Indiana did communicate and coordinate sampling plans and activities as they occurred. Sampling plans and results were shared directly with IN, MI as well as with the FDA and other state partners.
Joint IMT Activated June 6

• Both retail chains were supplied by the cut melon producer in Indianapolis.

• Large percentage of illnesses in MI and IN, with several traceback legs, sampling opportunities, and environmental sampling at the cut melon producer.

• MI and IN both have Rapid Response Teams

• Need for surge capacity, given the location and timing of incident

• Public messaging likely from multiple sources
FDA and ISDH Team Assembly

• The ISDH RRT Food Specialist joined with a ISDH Wholesale Inspector who was familiar with the establishment.

• Two FDA CSOs assembled the environmental sampling supplies.

• ISDH and FDA team members met at the FDA Resident Post to pack equipment for the joint visit to the cut melon producer.
Michigan Sampling Activities

• MDARD Food staff collected 29 melon samples
  • From retail grocery locations where Michigan cases shopped
• MDARD Lab staff collected 77 melon samples
  • From distribution centers; Food Assurance Program
• MDHHS collected 1 leftover pre-cut watermelon sample
  • From a case household
• MDARD Geagley Lab staff worked over the weekend
• All samples were negative
Indiana Sampling Activities

- Indiana Food Protection, Epidemiology and Laboratory Partners met to discuss the logistics for collecting and testing melon samples.
- IN collected 10 separate samples of melon.
- All of the samples collected tested negative for Salmonella species.
ISDH, MDARD & FDA Traceback Activities

• Michigan used loyalty shopper card information to trace the product from the retail stores to a cut melon producer in Indiana.

• Indiana conducted a traceback on a point of purchase location where the melon was received whole and cut at the retail location.

• The FDA collected shipping records from the cut melon producer in Indiana to trace the product back to the importer and melon packing houses.

• Shopper card information was helpful in collecting accurate purchase data from Chain A to begin trace-back activities.
Public Messaging and Recall Activities

• Chain A and B made a public announcement about the product being implicated in a Salmonella outbreak.
• Class I Recall at the IN cut melon producer.
• The FDA, CDC and several Midwest states issued messages.
• NASDA conducted a call with both produce industry and regulatory authorities about the outbreak.
• IMT demobilized on 6/11/18
Environmental Assessment Findings

• All product, environmental, and air filter samples tested negative.

• Preventive Controls inspection was initiated as part of the environmental assessment.

• Shipping records indicated that product was received from an importer in Florida.
Investigation Results

• No positive samples were collected during the investigation
• Traceback legs involving Chain A and B converged at the cut melon producer in Indiana.
• The traceback leg for Chain C converged at the produce importer in Florida and the foreign packing house.
• The produce importer in Florida was also a supplier to the cut melon producer in Indiana.
• Foreign country travel alert did not allow FDA to investigate further.
FDA Successes and Challenges

Success:

• FDA published the retail consignees
• FDA held calls with NASDA and Industry to notify them of the upcoming press releases from FDA, CDC, and firms related to the pending voluntary recall and advice to consumers. They were appreciative of the early notice

Challenge:

• Due to the nature of the recall processes, the list of states receiving product continued to expand daily. Once new states were identified, many FDA resources were required to review, draft, and comment on updates to the webpage.
Successes

• Quantity and quality of epidemiologic data early in outbreak
• Comprehensive food sampling
  • Retail samples based on cases’ purchase history
  • Samples at distribution centers
  • Leftover product from case household
• Trace-back
• Coordinated efforts between state and federal partners, increased surge capacity, highlighted strong relationships
• Communication
Challenges, Part 1

• Resource intensive response
• Data management
• Shopper card requests
  • Changes to the established process?
  • Working with a new retailer
  • Deciding when to stop making shopper card requests
• Early access to exposure data vs. interview fatigue
  • Reinterview with focused questions/requests
• Outbreak vehicle is perishable
Challenges

- Resource challenges for both FDA DET-DO/Indianapolis Post and the ISDH Food Protection.
- DET-DO’s joint operations procedure does not include IN.
- Limited number of staff have completed Preventive Controls regulator training.
- ISDH Food Protection leadership was at the 4 ½ day GOOD Samples Training when this occurred.
- Communication
  - MDARD struggled with instructions to field staff for sampling
  - ISDH FPP struggled with communicating with leadership
Questions?
Novel pattern *E. coli* O103 cluster resulting in a fatality, associated with travel to Mexico

Nicole Stone, MPH
Background

In July 2017, the Ohio Department of Health was notified of a death in a previously healthy 17-year-old male from Indiana due to septic shock and pancolitis without post-diarrheal hemolytic uremic syndrome (HUS) in an Ohio hospital. Laboratory testing identified E. coli Shiga toxin 1 (STEC) by polymerase chain reaction (PCR)
Exposure History: Activities

• History of recent travel to Puerto Vallarta, Mexico, 10 days prior to illness onset
  – Vallarta Adventures; zip lining, sail boat excursion, dolphin swim
  – Ocean: paddle boarding, snorkeling, banana boat ride; inner tubes
  – Swimming at pool and beach at hotel resort

• King’s Island, Ohio, 2 days prior to illness onset
  – Rides, no animal contact, no water exposures
Exposure History: Food

• Food History:
  – Food provided at resort
    • Steak tacos, eggs (scrambled or omelet), fish tacos, steak
    • Nothing reported to be raw or undercooked
    • No food items unique from family members
  – Food served at excursions
    • Zip line tour: bottled water provided by tour company, drank water from jug stations
    • Sailboat excursion: catered lunch- salad, salami lunch meat, pasta
  – Restaurant downtown Zoo Club and Margarita Grill (items unknown)
  – Chips and salsa

• Other domestic items:
  – Buffalo Wild Wings, McDonald’s, Perkins, various snack foods
  – King’s Island: Chicken Shack- chicken tender basket with fries, water, Icee
Timeline of Events

**Patient traveled to Puerto Vallarta, Mexico**
July 3-8, 2017

**Date of illness onset**
July 9, 2017

**Date of Diarrhea Onset**
July 13, 2017

**Patient visited King’s Island**
July 12-13, 2017

**Extended stay in Ohio**
July 11-14, 2017

**Rectal swab indicated Shiga Toxin 1 by PCR**
July 15, 2017

**Autopsy Completed**
July 18, 2017

**Epi Interview conducted with family**
July 22, 2017

**Typing completed at ODHL indicated E. coli O103**
July 25, 2017

**Autopsy Completed**
July 18, 2017

**Date of death**
July 17, 2017

**CDC received pathology specimens**
August 15, 2017

**CDC closed Cluster 1707MLEXW-1**
August 22, 2017

**Final report released by CDC confirming identification, serotype, and virulence**
September 21, 2017

**CDC assigned cluster code 1707MLEXW-1. Case isolates match E. coli O103 PFGE pattern combination EXWX01.3146 and EXWA26.2879 or EXWA26.2919**
July 28, 2017

**AST data received**
August 30, 2017

**Specific to initial case-patient**

**Laboratory testing (stool)**

**Cluster-specific epidemiological information**

**Epidemiological dates of note**
Methods

• Case definition:
  – Infection with *E. coli* O103 with a PFGE pattern matching the initial case-patient (EXWX01.3146 and EXWA26.2879 or EXWA26.2919)
• Additional cases were identified in other states using PulseNet
• Case-patients (or proxies) were interviewed about exposures in the week before illness onset
Cluster 1707MLEXW-1; E. Coli O103

• 8 cases identified [AL, CA (2), CO (2), CT, MO, WA]
• Case ranged from March 5, 2017-July 13, 2017
• Age: 17-83 years (Median: 20 years)
• 63% female
• No additional hospitalizations or deaths
• All cases reported travel Mexico in the week preceding illness onset
Shared Exposures

• Ground beef or steak (3)
• Leafy greens or salad (3)
• Recreational water exposure (4)
• Drinks with ice (2)
• Case-patients did not stay at common resorts or visit common restaurants
• No food vehicle was identified.
Conclusions

- Strain is new to the United States’ surveillance system
- Likely circulating in Mexico during time of illness identification
- Small sample size
  - Risk of severe outcome cannot be quantified
- Reasons for necrotizing colitis and subsequent sepsis in previously healthy youth are unknown
  - Further study is warranted
Acknowledgments

• Indiana State Department of Health
  – Madhura Sundararajan, MPH
  – Betsy Schroeder, DVM, MPH
  – Donna Allen, MA

• Ohio Department of Health
  – Martha Montgomery, MD, MHS
  – Brandi Taylor
  – Scott Nowicki

• Centers for Disease Control and Prevention
  – Lyndsay Bottichio, MPH
  – Wun-Ju Shieh, MD, MPH, PhD

• Cincinnati Health Department
  – Steven Englender, MD, MPH