Salmonellosis Outbreak Associated with Tomatoes Served at Community Indian Taco Dinner Event — Doniphan County, August 2018

Background

On Friday, August 10, 2018, the Doniphan County Health Department/Home Health (DCHD) and the Kansas Department of Health and Environment Infectious Disease Epidemiology and Response section (KDHE) initiated an outbreak investigation following reports of several persons experiencing gastrointestinal illness, including one hospitalized person diagnosed with salmonellosis after eating food served at a community Election Day Indian taco dinner on August 7. The Kansas Department of Agriculture Food Safety and Lodging Program (KDA) was immediately notified by KDHE.

Methods

Epidemiological Investigation

A media release was issued on August 10, 2018 requesting that dinner attendees complete an outbreak-specific questionnaire either online or by telephone. The questionnaire assessed for exposure to ingredients used for each food item served, and for illness prior to and after the dinner. Standard case investigation questionnaires and pulsed-field gel electrophoresis (PFGE) patterns among persons with recently reported *Salmonella* infection were reviewed to identify additional persons with exposure to the community dinner.

A case-control study was conducted to determine potential associations between illness and food exposures. A confirmed case was defined as laboratory evidence of *Salmonella* Newport with PFGE pattern JJPX01.0010 in a person who attended the dinner; persons reporting diarrhea after attending the dinner had probable cases, and controls attended the dinner and did not become ill. Statistical analysis was conducted using SAS® 9.4; odds ratios and 95% confidence intervals were calculated.

Environmental Investigation

The community dinner was held at a facility not regulated by KDA. However, upon invitation from the facility, KDA conducted an environmental assessment on August 10 and collected samples of all leftover foods for laboratory testing. On August 31, DCHD, KDHE, and KDA attended an in-person meeting at the facility with organizers of the dinner and persons who donated or prepared food to assess for opportunities for contamination. Tomatoes were collected from two donors' gardens for laboratory testing. KDA and the Missouri Department of Health and Senior Services (MDHSS) conducted traceback of purchased tomatoes and environmental assessments of facilities associated with purchased tomatoes.

Laboratory Analysis

Serotyping, PFGE, and whole genome sequencing (WGS) of *Salmonella* isolates were performed by the Kansas Health and Environmental Laboratories (KHEL) and the Missouri State Public Health Laboratory. Core genome Multi-Locus Sequence Typing (cgMLST) analysis was conducted by PulseNet at the Centers for Disease Control and Prevention (CDC). Laboratory analysis of food samples was performed by the KDA laboratory.

Results

Epidemiological Investigation

Among the 104 persons completing the outbreak questionnaire, 10 confirmed and 55 probable cases were identified with illness onsets ranging from August 7-14 (Figure 1). The most frequently reported symptoms were diarrhea, fever, and vomiting (Table 1). Thirty-three persons sought healthcare as a result of their illness; eleven case-patients were hospitalized for a median of two days (range: 1-5 days). The median incubation period was 1 day (range: <1-6 days). The majority of cases were female (57%) and between the ages of 50-74 (52%) (Table 2). The overall attack rate was 62.5% among persons completing the outbreak questionnaire. An estimated 125-150 persons attended the Indian taco dinner event.

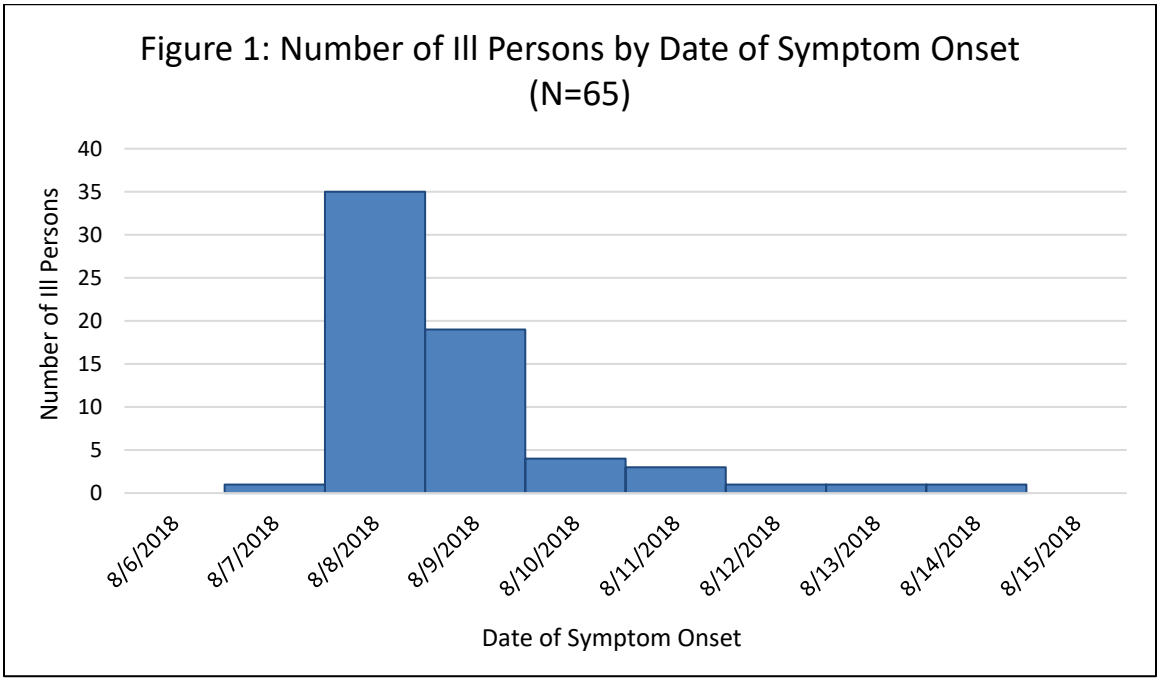

Table 1: Clinical Symptoms Reported Among Ill Persons

Symptoms	*# of Ill Persons/Total*	*% of Ill Persons*
Diarrhea	64/65	98.5%
Bloody stools	7/56	12.5%
Vomiting	24/59	40.7%
Fever	44/56	78.6%
Urinary tract infection	1/63	1.6%

Table 2: Demographics Among Ill Persons

Sex	*# of Ill Persons*	*% of Ill Persons*
Female	37	57%
Male	28	43%
Age Group		
1-4 years	1	2%
5-9 years	2	3%
10-19 years	5	8%
20-49 years	11	17%
50-74 years	34	52%
≥75 years	12	18%

The main food item served was Indian tacos, which consisted of fry bread and ground beef with the option of adding lettuce, onions, tomatoes, sour cream, cheese, picante sauce, or beans as toppings. In addition, a variety of pies (i.e., apple, apricot, cherry, chocolate, chocolate/caramel, coconut, lemon, peach, pecan, pumpkin, strawberry/rhubarb), watermelon, and black beans were served. No food exposures at the dinner were statistically associated with illness (Table 3).

Laboratory Analysis

Ten *Salmonella* isolates from case-patients and one *Salmonella* isolate from leftover tomatoes were identified as *Salmonella* Newport with PFGE pattern JJPX01.0010. These isolates were highly related by WGS, differing by 0-5 alleles. *Salmonella* was not found in leftover milk, taco meat, shredded lettuce, cheddar cheese, chopped onions, and flour from the event. In addition, *Salmonella* was not found in tomatoes sampled from two donors' home gardens.

Table 3. *Salmonella* Newport Exposure Information Among Dinner Attendees

	Controls n (%)	Cases n (%)	OR	95% CI
Food Item				
Indian taco	38 (38)	62 (62)	1.7	0.1 – 27.3
Pie (any)	31 (39)	49 (61)	1.1	0.4 – 2.9
Watermelon	8 (57)	6 (43)	0.4	0.1 – 1.2
Black beans	22 (41)	32 (59)	0.7	0.3 – 1.7
Iced tea	21 (60)	14 (40)	0.9	0.4 – 2.0
Water	20 (35)	37 (65)	1.1	0.4 – 2.7
Indian Taco Ingredient				
Beef	38 (38)	63 (62)	1.7	0.1 – 27.3
Black beans	21 (38)	34 (61)	1.2	0.5 – 2.9
Lettuce	35 (39)	54 (61)	0.7	0.2 – 3.3
Tomato	28 (38)	46 (62)	1.1	0.4 – 3.0
Onion	22 (33)	45 (67)	1.6	0.7 – 4.1
Cheese	38 (38)	62 (62)	0.8	0.1 – 9.3
Sour cream	32 (39)	50 (61)	0.8	0.3 – 2.3
Picante sauce	30 (43)	39 (57)	0.6	0.2 – 1.6

OR= Odds ratio; CI= Confidence interval

Environmental Investigation

Tomatoes served at the dinner were donated by three persons. Two of the three donated a small number of tomatoes from their home gardens; most of the tomatoes served at the event were donated by the third person who purchased the tomatoes from a grocer in Missouri. Tomatoes were prepared on-site; no source of contamination for the tomatoes was confirmed, and no opportunities for cross-contamination were identified. Environmental sampling of tomatoes and various environmental sources from the grocer and grocer's tomato suppliers was conducted by MDHSS. All samples were negative for *Salmonella*.

Conclusion

This outbreak of *Salmonella* Newport was linked to contaminated tomatoes served at a community dinner in Doniphan County, Kansas. Persons with outbreak cases of salmonellosis ate food from the event and became ill between August 7 and August 14, 2018. No single food item was statistically associated with illness; however, tomatoes from the event tested positive for the outbreak strain of *Salmonella* Newport. *Salmonella* isolates from case-patients and leftover tomatoes were indistinguishable by PFGE; WGS analysis determined the isolates were closely related.

The tomatoes were likely contaminated prior to being purchased for the event. Historically, tomatoes have been a source of salmonellosis outbreaks.[1,2] KDA, DCHD, and KDHE officials thoroughly assessed for contamination at the facility and at a donor's tomato garden but did not identify any opportunities for contamination. Environmental sampling of the Missouri grocer's tomato suppliers occurred 39 days after the original tomato purchase for the event and 20 days after the leftover tomato samples tested positive for the outbreak strain. This potentially affected our ability to detect *Salmonella*-positive environmental samples from the tomato suppliers and/or grocer.

This investigation was limited by the lack of controls available to complete the outbreak-specific questionnaire due to the high overall attack rate. Additionally, inaccuracies may exist in interviewees' food and symptom histories due to recall bias. This outbreak investigation was aided by the cooperation of the event volunteers and quick response of DCHD, KDA, and MDHSS in conducting environmental and epidemiological assessments.

To reduce the risk of consuming contaminated tomatoes individuals should avoid purchasing bruised or damaged tomatoes. All tomatoes, including those grown at home or purchased from a grocery store or farmer's market, should be thoroughly washed under running water just before eating. Cut, peeled, or cooked tomatoes should be refrigerated at 40°F within 2 hours or discarded. Cut tomatoes should be separated from raw, unwashed produce items, raw meats, and raw seafood.[3,4]

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