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Foodborne Outbreak of *Salmonella*: An Uninvited Wedding Reception Guest

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Background

The Nebraska Department of Health and Human Services (NDHHS) and Two Rivers Public Health Department (TRPHD) investigated an outbreak of gastrointestinal illness caused by *Salmonella* serotype Newport among guests at a September 2023 wedding. A shared nacho bar was suspected as the likely source of exposure.

Salmonellosis is a diarrheal illness that can cause acute diarrhea (sometimes bloody), abdominal pain, nausea, fever, and often vomiting. Symptoms present anywhere between 6 to 72 hours after exposure, with possible incubation periods of up to 16 days following low-dose ingestion. Symptoms usually persist for 4 to 7 days (*1*).

Methods

NDHHS was notified of a potential foodborne outbreak after routine case investigations revealed a common event between cases identified in two separate health department jurisdictions. These individuals reported attending a wedding reception the weekend prior and reported illness among other guests.

Routine case investigations were conducted for all *Salmonella* laboratory reports received by NDHHS and local health departments. Using the Epidemic Information Exchange system (Epi-X), NDHHS posted a call for *Salmonella* cases among people who reported travel to Nebraska the weekend of the wedding reception.

The Nebraska Public Health Lab (NPHL) was notified of the outbreak and provided names of patients and clinical specimen collection dates to arrange for fast-tracked whole genome sequencing (WGS). Sequencing results were uploaded into PulseNet, a national laboratory network that collects clinical foodborne illness cases, and environmental sample sequences to detect outbreaks.

Two Rivers Public Health Department contacted the bride and groom, several wedding reception guests, and the individual who prepared the meal to gather details relevant to the investigation. An event-specific REDCap questionnaire was developed to distribute to wedding attendees. Two Rivers Public Health Department published a press release including a link and QR code to the questionnaire to be distributed via the local television news and online forums.

Using food exposure responses from the questionnaire and case interviews, relative risk (RR) was calculated using OpenEpi for food items consumed at the reception. Illness onset dates were used to create an epidemic curve describing incubation periods. A probable case was defined as illness in an individual who reported diarrhea (3 or more loose stools in 24 hours) after attending the wedding reception. A confirmed case was defined as illness in an individual with a salmonella-positive stool culture or gastrointestinal panel (GIP) test who reported attending the wedding reception.

Results

Of approximately 250 guests in attendance, only 16 attendees completed the questionnaire (response rate of ~6.4%). Fifty percent (8/16) of respondents had either confirmed or probable illness. All confirmed cases sought medical attention. Among those reporting illness, 100% reported diarrhea (3 or more loose stools in a 24-hour period), 75% reported abdominal cramps, and 50% reported vomiting. All 16 respondents reported eating the ground beef served for the nacho bar. No food items had statistically significant RRs, as seen in (Table 1 [shown on page 2]). There was a median incubation period of 4.5 days and a range of 10 days.

NPHL conducted WGS testing on all confirmed *Salmonella* isolates. All isolates were highly related and indistinguishable by core genome multi locus sequence typing (cgMLST). The serotype of this outbreak was identified as *Salmonella* Newport. After uploading the sequences to PulseNet, these clinical strains were found to be highly related to a cecal cattle isolate collected in September 2022 and 3-alleles from two beef product isolates uploaded in late Summer 2023. Both isolates were collected in Texas, USA, by USDA-FSIS.

Over 80 pounds of ground beef were prepared by a family friend, with the meat being cooked in 20-pound increments and then vacuum-sealed and refrigerated. Receipts were not kept so purchase locations of the ground beef could not be identified. Dates of purchase ranged anywhere from 3 weeks to 6 months before the wedding reception. On the day of the reception, the meat was placed into roasters for 6+ hours prior to being served to guests, and it is unclear how long it was out during service. Temperatures were not taken during reheating or during holding. Food was self-served.

Discussion

Based on our epidemiologic and PulseNet comparison between the clinical outbreak isolates and recent beef product isolates, it suggests the source of this outbreak was likely the ground beef used for the nacho bar at this wedding reception. The reheating and hot holding of the ground beef could have allowed for further bacterial growth if safe minimum internal temperatures were not reached and held.

Due to low survey response rate, data were limited and thus we were unable to calculate a relative risk for the ground beef. However, outbreaks of *Salmonella* Newport have been linked to ground beef in the past. From August 2018 to February 2019, over 400 people became ill with *Salmonella* Newport across 30 states after eating contaminated ground beef (*2*). Epidemiological data and laboratory results point to ground beef as the most likely source of this outbreak.

Recommendations

For large events, a licensed caterer should be used, and food should be served by trained servers. Food should be prepped, cooked, and stored in a food-licensed kitchen. Ground beef should be cooked to a safe minimum internal temperature of 160ºF to eliminate pathogens and prevent foodborne illnesses. The meat should then be held at 140ºF or above until served. Cold foods should be kept at 40ºF or below (*3*). Reporting foodborne illnesses to public health authorities is a vital part of the overall strategy to protect the public from the risks associated with consuming contaminated food. It helps in early detection, outbreak control, prevention, and improvement of food safety practices, ultimately leading to a safer food supply for everyone. For more information on food safety, visit https://www.fsis.usda.gov/food-safety. To report a foodborne illness, visit https://dhhs.ne.gov/Pages/Foodborne-Illness.aspx.

References

1. Heymann, DL, editor. Control of Communicable Diseases Manual. 21st ed. Washington, DC: American Public Health Association; 2022.
2. National Center for Emerging and Zoonotic Infectious Diseases, Division of Foodborne, Waterborne, and Environmental Diseases. Center for Disease Control and Prevention; 2022. Access October 17, 2023. https://www.cdc.gov/salmonella/newport-10-18/index.html
3. Food Safety and Inspection Service. US Department of Agriculture; 2023. Accessed October 16, 2023. https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/food-safety-basics/cooking-groups

Table 1. Relative Risk of Food Exposures at Wedding Reception (n = 16)

Exposure	Ill (n=8)				Not Ill (n=8)				RR (95% CI)
	Exposed		Not Exposed		Exposed		Not Exposed		
	n	%	n	%	n	%	n	%	
Ground Beef	8	100.0%	0	0.0%	8	100.0%	0	0.0%	Undefined
Lettuce	5	62.5%	3	37.5%	5	62.5%	3	37.5%	1.00 (0.36, 2.75)
Shredded Cheese	4	50.0%	4	50.0%	8	100.0%	0	0.0%	0.33 (0.14, 0.74)
Queso	5	62.5%	3	37.5%	5	62.5%	3	37.5%	1.00 (0.36, 2.75)
Salsa	2	25.0%	6	75.0%	5	62.5%	3	37.5%	0.42 (0.12, 1.51)
Sour Cream	6	75.0%	2	25.0%	7	87.5%	1	12.5%	0.69 (0.25, 1.86)
Cookies	5	62.5%	3	37.5%	6	75.0%	2	25.0%	0.75 (0.28, 1.98)
Cake Pop	5	62.5%	3	37.5%	6	75.0%	2	25.0%	0.75 (0.28, 1.98)

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