

***Salmonella* Braenderup Infections Associated with the Green Mill**

Hennepin County

April 2019

Background

On April 19, 2019, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Braenderup isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Minnesota designation BR134). Initial interviews with these cases revealed that both had eaten food from the Green Mill in Bloomington in the week before their illness onset. City of Bloomington Environmental Health Division (CBEH) was notified, and an investigation was initiated.

Methods

Cases were defined as individuals who tested positive for *S. Braenderup* with PFGE pattern BR134, or a Green Mill – Bloomington patron who developed diarrhea (≥ 3 stools in a 24-hour period) that was at least 3 days in duration or was accompanied by a fever, after eating food from the restaurant. Stool samples collected from consenting individuals were submitted to the MDH PHL for bacterial and viral testing. PFGE and whole genome sequencing (WGS) was performed on isolates.

MDH staff collected online orders, information for catering groups, and receipts from April 5, 8, 9, and 10, and patrons were called to find additional cases and controls.

All restaurant employees were required to submit two stool samples to the MDH PHL for *Salmonella* testing. Any employee reporting illness on or after March 15 was excluded from work in food service until two consecutive stool samples tested negative for *Salmonella* by culture. Employees who tested positive for *Salmonella* by culture were excluded until two consecutive stool samples tested negative.

Results

Eighty-nine restaurant patrons and 18 additional catered training event attendees were interviewed. Seven cases (7%) were identified, including five laboratory-confirmed cases. Two patrons reported illness but did not meet the case definition and were excluded from further analysis. Cases reported meal dates of March 22 (n=1), April 5 (n=3), April 8 (n=4), April 9 (n=3), April 10 (n=3). Four cases had 2 to 3 meal dates. Onsets of illness ranged from March 29 to April 16. The median age of cases was 39 years (range, 6 to 65 years), and four (57%) cases were male. All seven cases reported diarrhea and cramps, five (71%) fever, one (14%) vomiting, and one (14%) bloody stool. Four (57%) cases visited a healthcare provider, but none were hospitalized or died. The median incubation for the three cases with only one meal date was 115 hours (range, 1.5 to 175 hours).

Three laboratory-confirmed cases attended the same training event catered by the Green Mill restaurant on April 8, 9, and 10. All other cases were sit-down restaurant patrons or had take-out. One case tested negative for *Salmonella*, and the other case did not return a stool kit.

In a univariate analysis including all laboratory-confirmed cases and controls from the catered training event and restaurant patrons from April 5 and 8, there were no significant findings. At the ingredient level, consumption of diced tomatoes (5 of 5 cases vs. 18 of 60 controls; odds ratio [OR], undefined; $p = 0.004$), any tomatoes (5 of 5 cases vs. 21 of 60 controls; OR, undefined; $p < 0.008$) and romaine lettuce (5 of 5 cases vs. 23 of 60 controls; OR, undefined; $p < 0.012$) were significantly associated with illness. In a multivariable analysis, no items remained independently associated with illness, likely because of the high degree of collinearity between tomatoes and romaine lettuce.

CBEH sanitarians visited Green Mill on April 19. All 53 employees were interviewed, and 5 employees were excluded because they reported vomiting, diarrhea, or fever since March 17. The illness onset dates for employees were April 1, April 9, April 11, April 19, and April 24. All five of these employees tested negative twice for *Salmonella* on their first two samples.

Two employees who did not initially report any gastrointestinal symptoms tested positive for *S. Braenderup* that matched by PFGE and whole genome sequencing to patron isolates. Both positive employees were banquet servers. One positive employee reported not having any gastrointestinal symptoms, and worked on April 5, 8, 9, and 10. The second positive employee, who initially reported having no illness, later reported diarrhea, chills, and abdominal pain but was unable to identify an onset date. This employee worked on April 5.

Sanitarians identified numerous issues. The Victory produce wash was plumbed to the 3-compartment sink. The paper towel dispenser was empty on the cook line. An employee was observed touching pizza with bare hands. An employee was observed rinsing the pizza cutter in the hand sink. The pressure gauge was not functional on the dish washing machine.

Fresh produce, including tomatoes and romaine lettuce, were delivered on the morning of April 5. Tomatoes are rinsed with Victory wash in the sink, diced or sliced, and then stored in the walk-in cooler and line flip top cooler. The romaine lettuce is delivered pre-cut and pre-shredded. Food for catered banquets and restaurant patrons are prepared in different areas.

Conclusion

This was an outbreak of *S. Braenderup* infections associated with the Green Mill restaurant in Bloomington and identified through routine disease surveillance. Tomato and romaine lettuce consumption were statistically associated with illness. Two banquet servers tested positive for the outbreak strain of *S. Braenderup*. Food workers infected with *Salmonella* may have been the source of contamination, but other sources of contamination could not be ruled out.