

***Salmonella* Javiana Infections Likely Associated with Cucumbers or Iceberg Lettuce**

October-November

Multiple counties/Multiple states

On October 23, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Javiana isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Centers for Disease Control and Prevention [CDC] *Xba*I designation JGGX01.0500; MDH designation JVN74). The cases were both interviewed using a standard questionnaire. A review of the national PulseNet database revealed six additional *S. Javiana* isolates with the outbreak PFGE pattern in four states. A multi-state investigation was subsequently initiated. From October 24 through October 31, the MDH PHL received two additional *S. Javiana* isolates with the outbreak PFGE pattern.

A case was defined as a person from whom *S. Javiana* with the outbreak PFGE pattern (JGGX01.0500) was isolated, with a specimen collection date after October 1, 2012. Minnesota cases were interviewed with a broad-based exposure questionnaire. Exposures of interest identified during hypothesis generation were compared to the 2007 FoodNet Population Survey using a binomial probability model. The Minnesota Department of Agriculture (MDA), the South Dakota Department of Health (SDHD), and the Arizona Division of Public Health Services (ADPHS) conducted traceback investigations of suspect products.

Nationally, 37 cases from 9 states were identified in this outbreak, (Arizona 3, California 15, Illinois 6, Michigan 2, Minnesota 4, North Dakota 2, New Jersey 1, South Dakota 1, and Wisconsin 3). The cases had a median age of 23 years (range, 1 to 83 years) and illness onset dates from August 6 through November 10. Twenty (50%) cases were female. Six cases were hospitalized.

Geographically, cases were clustered in the midwest and west/southwest with an outlying case in New Jersey. These distinct geographic clusters also displayed strong demographic differences. For instance, 13 of 16 (81%) of west/southwest cases were male, whereas 13 of 18 (72%) midwest cases were female. The west/southwest cases were also slightly older (median age, 30 years; range, 0.3 to 95 years) compared to midwest cases (median age, 21.5 years; range, 6 to 65 years).

The four Minnesota cases had a median age of 33 years (range, 9 to 65 years) and illness onset dates from October 3 through October 20. All four cases reported diarrhea and cramps, two (50%) reported bloody stools, one (25%) reported vomiting, and one (25%) reported fever. No Minnesota cases were hospitalized.

Upon initial interview, all four Minnesota cases reported eating at different Chain A restaurant locations in the week prior to illness onset. Nationally, only the South Dakota case also reported eating at a Chain A location. While cases reported consuming a variety of sub sandwiches at the restaurants, all five reported consuming cucumbers, four (80%) iceberg lettuce, four (80%) American cheese, three (60%) green peppers, three (60%) black olives, three (60%) pickles, and two (40%) spinach. Among the Minnesota cases, three (75%) reported consuming bananas, three (75%) eggs, and three (75%) different brands of shredded cheddar cheese. No other food items were reported by more than two cases.

A case-case comparison study was conducted to evaluate the hypothesis that eating at restaurant Chain A was associated with illness. Four age- and gender-matched comparison cases of non-Javiana *Salmonella* serotypes with illness onsets from October 1 through October 31, 2012 were selected per case. The match was broken for the analysis due to the small number of cases. Eating at restaurant Chain A was associated with illness among Minnesota cases (4 of 4 cases vs. 3 of 13 comparison cases; odds ratio, undefined; 95% confidence interval, undefined; $p = 0.007$).

Nationally, 23 cases were interviewed. Consuming iceberg lettuce (19 of 23 [83%] cases vs. 46% in the population survey; $p = 0.06$), fresh spinach (8 of 20 [40%] cases vs. 24% in the population survey; $p = 0.08$), and cucumbers (14 of 22 [64%] cases vs. 47% in the population survey; $p = 0.09$) approached being significantly associated with illness.

MDA and SDHD conducted a traceback of the cucumbers and iceberg lettuce consumed by cases from the restaurant Chain A locations. ADPHS conducted a traceback of the cucumber and iceberg lettuce consumed by two cases after purchase at different retail locations. Distributor A in Rogers, Minnesota supplied the cucumbers and iceberg lettuce to all four restaurants Chain A locations in Minnesota at which cases dined. Distributor A received cucumbers from Distributor B in Minneapolis, Minnesota and iceberg lettuce from Producer A in Salinas, California. SDHD determined that Distributor C in Omaha, Nebraska supplied both the cucumbers and iceberg lettuce to the Chain A restaurant location where the South Dakota case ate. Distributor C also received cucumbers from Distributor B in Minneapolis, Minnesota and iceberg lettuce from Producer A in Salinas, California. Records indicated three possible common growers for the cucumbers: a grower in Norman Park, Georgia; a grower in Vizcanio, Baja California, Mexico; and a grower in Vicente Guerrero, San Quintin Baja California, Mexico. Records indicated 17 possible common iceberg lettuce growers that supplied Producer A. The Arizona case reported purchasing both cucumbers and iceberg lettuce from a grocery store and small market. The ADPHS iceberg lettuce traceback found no connection to Producer A. The cucumbers traced back to growers in Sonora, Mexico and Nogales, Arizona.

This was a multi-state outbreak of *S. Javiana* infections. Four cases of *S. Javiana* related to this outbreak were identified in Minnesota. In Minnesota, cases were associated with eating at restaurant Chain A. Exposure histories and tracebacks conducted for cases in Minnesota and South Dakota suggested that the most likely vehicle was either iceberg lettuce or cucumbers. Consumption of these produce items by cases in all of the involved states was higher than expected based on the FoodNet Population Survey, although the differences were not quite statistically significant. The tight distribution of case illness onsets also suggests a product with a short shelf life, which is consistent with a produce item like iceberg lettuce or cucumbers. The national investigation was limited in that only 23 of 37 cases were interviewed. In addition, the demographic differences between the two geographic clusters suggest that the two may not have been directly related.