

***E. coli* O157:H7 Infections Associated with Romaine Lettuce**

October

Multiple counties/Multiple states

On November 8, 2011, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified several recent *E. coli* O157:H7 isolates with a two enzyme pulsed-field gel electrophoresis (PFGE) pattern (Minnesota designation MN179ECB13) indistinguishable from isolates that were part of a national cluster investigation (Centers for Disease Control and Prevention [CDC] pattern designation EXHX01.0047/EXHA26.0015, cluster ID 1110MOEXH-2) centered in Missouri; several salad bar items from a Missouri grocery store chain (Chain A) had been tested as part of the national investigation. MN179ECB13 is a common *E. coli* O157:H7 PFGE pattern; multiple locus variable-number tandem repeats analysis (MLVA) was used to further subtype isolates. One of the Minnesota isolates matched the Missouri/national outbreak MLVA pattern (Minnesota designation MEC89), and Minnesota joined the national investigation.

Nationally, a case was defined as a person from whom *E. coli* O157:H7 with PFGE pattern combination EXHX01.0047/EXHA26.0015 and the outbreak MLVA pattern was isolated on or after October 7, 2011.

Minnesota cases were interviewed with a standard broad-based exposure questionnaire regarding illness history and food exposures. Nationally, case exposures were compared to 2006-2007 FoodNet population survey baseline exposure data, and a case-control study was conducted.

The Minnesota Department of Agriculture (MDA) obtained food invoices from the university dining hall where one of the Minnesota cases was exposed, and performed a traceback investigation to determine the source of romaine lettuce served at the dining hall. Traceback information was provided to CDC and the United States Food and Drug Administration (FDA). FDA and Missouri health and agriculture authorities also conducted a traceback investigation of romaine lettuce served at implicated Missouri Chain A grocery store salad bars.

Fifty-eight cases from nine states were identified in this outbreak: Missouri (38 cases), Illinois (9), Arkansas (2), Indiana (2), Kansas (2), Minnesota (2), Arizona (1), Kentucky (1), and Nebraska (1). Illness onsets ranged from October 9 to November 7. Thirty-three (67%) of 49 cases were hospitalized, and three (5%) developed hemolytic uremic syndrome (HUS). The median age of cases was 28 years (range, 1 to 94 years), and 59% were female.

Two Minnesota cases met the case definition: a 28 year-old male from St. Paul with onset on October 28; and, an 18 year-old female from Minneapolis with onset on October 24. One case was hospitalized for 5 days and neither developed HUS. The 24 year-old case denied eating romaine lettuce in the week prior to his illness onset. The 18 year-old case reported consumption of romaine lettuce as part of salads she prepared from a university dining hall salad bar on multiple occasions in the week prior to her illness onset.

Nationally, 22 (81%) of 27 cases interviewed with a national hypothesis-generating questionnaire reported consumption of romaine lettuce; this was statistically significant compared to the proportion (47%) of FoodNet population survey respondents who reported consumption of romaine lettuce ($p < 0.001$). Supplemental interviews conducted with cases (mostly in Missouri, or who had travelled to Missouri) specifically implicated romaine lettuce served at multiple locations of Chain A salad bars. In a national case-control study of 22 ill and 82 well persons that included controls who had shopped at a Chain A grocery store in Missouri, consumption of romaine lettuce, shopping at Chain A, and consumption of food from a Chain A salad bar were all significantly associated with illness. Romaine served at all Chain A salad bars was sourced from a single lettuce processing facility via a single distributor. Chain A had voluntarily removed suspected items, including romaine, from its salad bars on October 26 as a precaution during the investigation.

The Minnesota university dining hall received pre-packaged, pre-chopped romaine from Distributor A (Minnesota); the lettuce was not processed further before served on the salad bar. An MDA traceback investigation of chopped romaine served on the university salad bar during the case's likely meal dates identified five California growers of interest. FDA traceback from several Chain A locations and a university campus in Missouri identified two California growers of interest. The MDA and FDA tracebacks identified one common grower, a farm in California. A single lot of romaine lettuce harvested from this California farm was used to supply grocery Chain A in Missouri and the Minnesota university dining hall. This lot also went to the Missouri university's distributor, but could not be connected to the university due to lack of adequate records.

In Minnesota, whole romaine heads from the implicated farm were shipped by Shipper A in California to Processor A in Minnesota. Chopped romaine from Processor A was shipped to Distributor A, which then distributed the romaine to the Minnesota university dining hall. In Missouri, whole romaine heads from Shipper A were shipped through a different processor and distributor.

Production of romaine at the implicated farm had stopped at the time of the FDA investigation, and the source of contamination was not identified.

This was a multi-state foodborne outbreak of *E. coli* O157:H7 infections associated with consumption of California-grown chopped romaine lettuce served at salad bars. Minnesota had two cases included in the national outbreak, one of whom reported consuming chopped romaine from a university dining hall salad bar. Traceback of the Minnesota case's romaine exposure was a key component of national traceback efforts that led to identification of a single implicated farm and lot of romaine. The ultimate source and mechanism of contamination of the lettuce at the farm were not identified.

Reference

1. <http://www.cdc.gov/ecoli/2011/ecoliO157/romainelettuce/032312/index.html>, Accessed November 24, 2014.