

Outbreak of *E. coli* Infections Linked to Romaine Lettuce

Final Update



Food Safety Alert

Posted January 15, 2020 at 3:00 PM ET

This outbreak appears to be over. CDC is no longer advising that people avoid romaine lettuce from the Salinas Valley growing region in California. *E. coli* is an important cause of illness in the United States. More information about *E. coli*, and steps people can take to reduce their risk of infection, can be found on the [E. coli and Food Safety web page](#).

CDC, public health and regulatory officials in several states, and the US Food and Drug Administration (FDA) investigated a multistate outbreak of *E. coli* O157:H7 infections linked to romaine lettuce harvested from the Salinas Valley growing region in California.

Final Outbreak Information

- As of January 15, 2020, this outbreak appears to be over.
- Contaminated romaine lettuce that made people sick in this outbreak harvested from the Salinas Valley growing region in California is no longer available for sale. CDC is no longer advising that people avoid romaine lettuce from this growing region.
- A total of 167 people infected with the outbreak strain of *E. coli* O157:H7 were reported from 27 states.
 - A total of 85 hospitalizations were reported, including 15 people who developed hemolytic uremic syndrome, a type of kidney failure. No deaths were reported.
- Epidemiologic, laboratory, and traceback evidence indicated that romaine lettuce from the Salinas Valley growing region in California was contaminated with *E. coli* O157:H7 and made people sick.

Advice to Consumers, Restaurants, and Retailers

At A Glance

- [Reported Cases](#): 167
- [States](#): 27
- Hospitalizations: 85
- Deaths: 0
- Recall: Yes

Contaminated romaine lettuce that made people sick in this outbreak from the Salinas Valley growing region in California is no longer available for sale. CDC is no longer advising that people avoid romaine lettuce from the Salinas Valley growing region in California.

[Follow these steps](#) to help keep you healthy and make your fruits and vegetables safer to eat:

- Wash your hands before and after preparing fruits and vegetables.
- Wash or scrub all fruits and vegetables under running water before eating, cutting, or cooking.
 - Fruits and vegetables labeled “prewashed” do not need to be washed again at home.
- Use separate cutting boards for fruits and vegetables and for raw meats, poultry, seafood, or eggs.
- Use separate plates and utensils for cooked and raw foods.
- Store fruits and vegetables away from, and not next to or below, raw meat, poultry, or seafood. These items can drip juices that may have germs.

Take action if you have symptoms of an *E. coli* infection.

- Talk to your healthcare provider.
- Write down what you ate in the week before you started to get sick.
- Report your illness to your local health department.
- Assist public health investigators by answering questions about your illness.
- [Wash your hands thoroughly](#) after changing diapers, using the toilet, and before and after preparing food to lower the chance of infecting others.

Symptoms of *E. coli* Infection

- People usually get sick from Shiga toxin-producing *E. coli* (STEC) 2 to 8 days (average of 3 to 4 days) after swallowing the germ.
- Some people with *E. coli* infections may get a type of kidney failure called hemolytic uremic syndrome (HUS).
- Antibiotics are not recommended for patients with suspected *E. coli* infections until diagnostic testing can be performed and *E. coli* infection is ruled out. Some studies have shown that administering antibiotics to patients with *E. coli* infections might increase their risk of developing HUS, and a benefit of treatment has not been clearly demonstrated.

Final Investigation Details

January 15, 2020

CDC, public health and regulatory officials in several states, and the US Food and Drug Administration (FDA) investigated a multistate outbreak of Shiga toxin-producing *E. coli* (STEC) O157:H7 infections.

Public health investigators used the [PulseNet](#) system to identify illnesses that may be part of this outbreak. PulseNet is the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC. DNA

fingerprinting is performed on *E. coli* bacteria isolated from ill people by using a standardized laboratory and data analysis method called [whole genome sequencing](#) (WGS). CDC PulseNet manages a national database of these sequences that are used to identify possible outbreaks. WGS gives investigators detailed information about the bacteria causing illness. In this investigation, WGS showed that bacteria isolated from ill people were closely related genetically. This means that people in this outbreak were more likely to share a common source of infection. WGS also showed that this outbreak was caused by the same strain of *E. coli* O157:H7 that caused outbreaks linked to leafy greens in [2017](#) and to romaine lettuce in [2018](#).

A total of 167 people infected with the outbreak strain of *E. coli* O157:H7 were reported from 27 states. The Public Health Agency of Canada (PHAC) also reported several illnesses that were closely related genetically to illnesses in the United States.

Illnesses started on dates ranging from [September 20, 2019, to December 21, 2019](#). Ill people ranged in age from less than 1 to 89 years, with a median age of 27. Sixty-four percent of ill people were female. Of 165 ill people with information available, 85 (52%) hospitalizations were reported, including 15 people who developed hemolytic uremic syndrome (HUS), a type of kidney failure. No deaths were reported.

WGS analysis of bacterial isolates from 159 ill people did not predict antibiotic resistance in 157 of the isolates, but predicted resistance in 2 isolates. One isolate contained a resistance gene for ampicillin, and a second isolate contained resistance genes for ampicillin, chloramphenicol, streptomycin, sulfisoxazole, and tetracycline. WGS analysis of five bacterial isolates from a lettuce sample did not predict antimicrobial resistance. [Standard antibiotic resistance testing](#) of clinical isolates by [CDC's National Antimicrobial Resistance Monitoring System](#) (NARMS) laboratory is currently underway. These findings do not affect treatment guidance since antibiotics are not recommended for patients with *E. coli* O157 infections.

Investigation of the Outbreak

[Epidemiologic, laboratory, and traceback evidence](#) indicated that romaine lettuce from the Salinas Valley growing region in California was the likely source of this outbreak.

In interviews, ill people answered [questions about the foods they ate and other exposures](#) in the week before they became ill. Ninety-four (83%) of 113 people

interviewed reported eating romaine lettuce. This percentage was significantly higher than results from a survey of healthy people in which 47% reported eating romaine lettuce in the week before they were interviewed. Ill people reported eating different types of romaine lettuce in several restaurants and at home.

The Maryland Department of Health identified the outbreak strain of *E. coli* O157:H7 in an unopened package of Ready Pac Foods Bistro® Chicken Caesar Salad collected from a sick person's home in Maryland. The Wisconsin Department of Health Services identified the outbreak strain of *E. coli* O157:H7 in an unopened bag of Fresh Express® Leafy Green Romaine collected from an ill person's home in Wisconsin. The Salinas Valley growing region in California was the main source of the romaine lettuce in both products.

FDA and states traced the source of some of the romaine lettuce eaten by ill people. Information gathered indicated that the romaine lettuce of interest was harvested from the Salinas Valley growing region in California. For more information about the traceback investigation, visit the FDA website.

Contaminated romaine lettuce from the Salinas Valley growing region in California is no longer available for sale. As of January 15, 2020, this outbreak appears to be over.