

## *Salmonella*

# Multistate Outbreak of Human *Salmonella* I 4,[5],12:i:- Infections Linked to Alfalfa Sprouts (Final Update)

NOTICE: This outbreak is over. The information on this page has been archived for historical purposes only and will not be updated.

Posted February 10, 2011

## Outbreak Summary

CDC collaborated with public health officials in many states and the U.S. Food and Drug Administration (FDA) to investigate a multistate outbreak of *Salmonella* serotype I 4,[5],12:i:- infections. Investigators used DNA analysis of *Salmonella* bacteria obtained through diagnostic testing to identify cases of illness that may be part of this outbreak.

From November 1, 2010, through February 9, 2011, 140 individuals infected with the outbreak strain of *Salmonella* serotype I 4,[5],12:i:-, whose illnesses began (onset dates) since November 1, were reported from 26 states and the District of Columbia. The number of ill persons identified in each state and the District of Columbia with the outbreak strain is as follows: Arkansas (1), California (1), Colorado (1), Connecticut (1), District of Columbia (1), Georgia (1), Hawaii (1), Iowa (1), Illinois (70), Indiana (13), Kentucky (1), Louisiana (1), Massachusetts (2), Maryland (1), Missouri (23), Nebraska (1), Nevada (1), New Jersey (1), New York (2), North Carolina (1), Oregon (1), Pennsylvania (4), South Carolina (1), South Dakota (1), Tennessee (2), Virginia (2), and Wisconsin (4). Among 138 persons for whom information is available, reported illness onset dates range from November 1 to January 18, 2011. Case-patients range in age from 1 to 85 years-old, with a median age of 28 years-old. Eighty-seven patients (or 63%) are female. Among persons with available information, 24% reported being hospitalized. No deaths were reported. Because the pulsed-field gel electrophoresis (PFGE) pattern associated with this particular *Salmonella* serotype commonly occurs in the United States, some of the cases identified may not be related to this outbreak.

The outbreak can be visually described with a chart showing the number of people who became ill each day. This chart is called an epidemic curve or epi curve. Illnesses that occurred after January 14, 2011, might not be reported yet due to the time it takes between when a person becomes ill and when the illness is reported. This takes an average of 2 to 3 weeks. For more information, please see [Timeline for Reporting Cases of \*Salmonella\* Infection](#).

## Investigation of the Outbreak

Collaborative investigative efforts of local, state, and federal public health and regulatory agencies linked this outbreak to consumption of Tiny Greens Alfalfa Sprouts or Spicy Sprouts (which contain alfalfa sprouts mixed with radish and clover sprouts). The sprouts were distributed to various customers, including farmers' markets, restaurants, and groceries in Illinois, Indiana, Iowa, and Missouri and may also have been distributed to other Midwestern states.

Half of the illnesses occurred in Illinois, where many of the ill individuals ate sandwiches containing sprouts at various Jimmy John's outlets. FDA and the Illinois Department of Public Health (IDPH) conducted an inspection of Tiny Greens Organic Farm. FDA collected both product and environmental samples. Thus far, product samples tested by FDA were negative. One environmental (water run-off) sample yielded *Salmonella* serotype I 4,[5],12:i:- that was indistinguishable from the outbreak strain by PFGE. Further details about the FDA investigation can be found at the FDA website.

## Clinical Features/Signs and Symptoms

Most persons infected with *Salmonella* develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. The illness usually lasts 4 to 7 days, and most persons recover without treatment. However, in some persons, the diarrhea may be so severe that the patient needs to be hospitalized. *Salmonella* infection may spread from the intestines to the bloodstream, and then to other body sites and can cause death unless the person is treated promptly with antibiotics. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness from *Salmonella* infection.

# Sprouts and Foodborne Illness

Since 1996, there have been at least 30 reported outbreaks of foodborne illness associated with different types of raw and lightly cooked sprouts. Most of these outbreaks were caused by *Salmonella* and *E. coli* infections.

## Recall Information

On December 29, 2010, Tiny Greens Organic Farm of Urbana, Illinois, [announced a recall of specific lots of Alfalfa Sprouts and Spicy Sprouts](#)  because they have the potential to be contaminated with *Salmonella*. Product was distributed through various distributors in Illinois, Indiana, and Missouri and could have ended up in restaurants and supermarkets near those areas.

## Advice to Consumers, Retailers, and Others

Consumers should not eat recalled Tiny Greens brand Alfalfa Sprouts or Spicy Sprouts, and restaurant and food service operators should not serve them. Consumers are advised to review [the recall announcement](#)  for a list of recalled products. Consumers, retailers, and others who have Tiny Greens Alfalfa Sprouts or Spicy Sprouts should dispose of them in a closed plastic bag placed in a sealed trash can. This will prevent people or animals from eating them.

Below are additional recommendations:

- Persons who think they might have become ill from eating potentially contaminated products should consult their health care providers.
- Children, the elderly, pregnant women, and persons with weakened immune systems should avoid eating raw sprouts of any kind (including alfalfa, clover, radish, and mung bean sprouts).
- Cook sprouts thoroughly to reduce the risk of illness. Cooking thoroughly kills the harmful bacteria.
- Request that raw sprouts not be added to your food. If you purchase a sandwich or salad at a restaurant or delicatessen, check to make sure that raw sprouts have not been added.
- To learn more about illnesses associated with sprouts, visit [Foodsafety.gov](https://www.foodsafety.gov) .

## Additional Resources

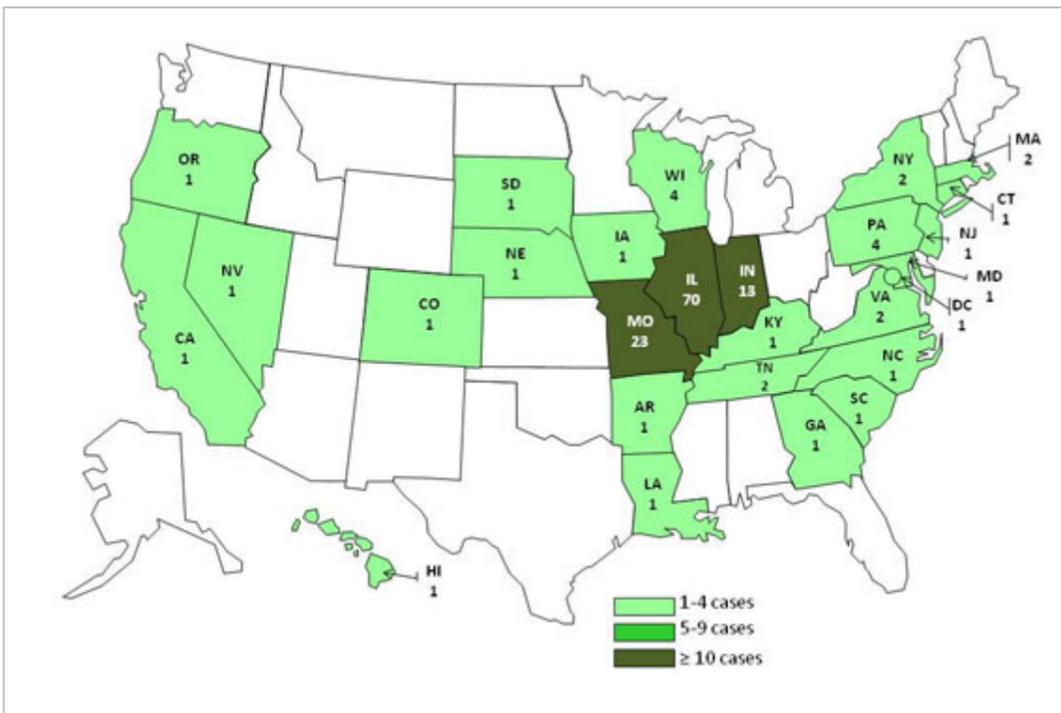
- [FDA 483 Inspection Report of the facility](#)  [PDF – 4 MB/6 pages]  
- [FoodSafety.gov](https://www.foodsafety.gov)
- [General Information: \*Salmonella\*](#)
- [CDC's Role in Outbreak Investigations](#)

## CDC's Role in Food Safety

As an agency within the U.S. Department of Health and Human Services (HHS), CDC leads federal efforts to gather data on foodborne illnesses, investigate foodborne illnesses and outbreaks, and monitor the effectiveness of prevention and control efforts. CDC is not a food safety regulatory agency but works closely with the food safety regulatory agencies, in particular with HHS's U.S. Food and Drug Administration (FDA) and the Food Safety and Inspection Service within the United States Department of Agriculture (USDA). CDC also plays a key role in building state and local health department epidemiology, laboratory, and environmental health capacity to support foodborne disease surveillance and outbreak response. Notably, CDC data can be used to help document the effectiveness of regulatory interventions.

## Final Case Count Map

Persons infected with the outbreak strain of *Salmonella* I4,[5],12:i:-, by state, as of February 9, 2011 (n=140)

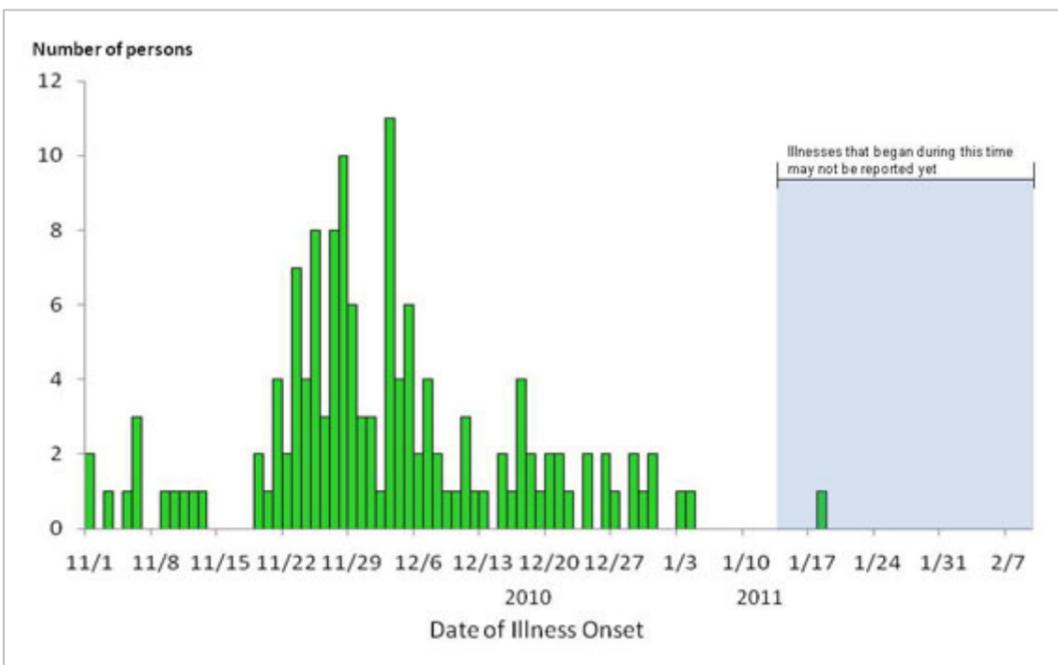


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## Final Epi Curve

This outbreak can be visually described with a chart showing the number of persons who became ill each day. This chart is called an epi curve. Please see the [Timeline for Reporting Cases of Salmonella Infection](#) for more details on the reporting process.

## Persons infected with the outbreak strain of *Salmonella* I 4,[5],12:i:-, by date of illness onset\*



\*n=138 for whom information was reported as of February 9, 2011. Onset data not currently available for all persons with reported illness.