



## Salmonella

# Investigation Update: Multistate Outbreak of Human *Salmonella* Heidelberg Infections Linked to Ground Turkey

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**September 29, 2011**

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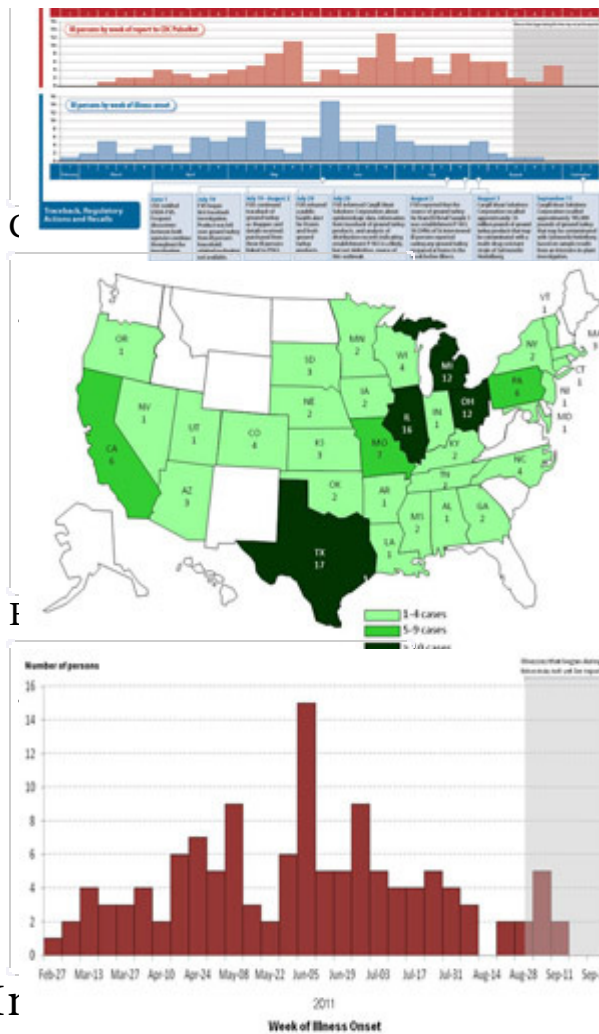
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### Today's Highlights

- A total of 129 persons infected with the outbreak strain of *Salmonella* Heidelberg have been reported from 34 states.
- Collaborative investigative efforts of state, local, and federal public health and regulatory agencies indicate that ground turkey is the likely source of this outbreak.
- Contaminated ground turkey is being recalled from grocery stores but may still be in consumers' homes.
- Consumers should check their homes for [recalled ground turkey products](#) and not eat them; restaurant and food service operators should not serve them.
- The outbreak strain of *Salmonella* Heidelberg is resistant to several commonly prescribed antibiotics. This antibiotic resistance may be associated with an increased risk of hospitalization or possible treatment failure in infected individuals.
- [Timeline of Events: Multistate Outbreak of \*Salmonella\* Heidelberg Infections Associated with Ground Turkey—United States, 2011](#)

### Timeline of Events





CDC is collaborating with public health officials in many states and the U.S. Department of Agriculture’s Food Safety and Inspection Service (USDA-FSIS) to investigate a multistate outbreak of *Salmonella* Heidelberg infections that is likely caused by eating ground turkey. Public health investigators are using DNA “fingerprints” of *Salmonella* bacteria to identify ill persons who may be part of this outbreak. The *Salmonella* bacteria are obtained from diagnostic testing; pulsed-field gel electrophoresis (PFGE) is used to determine DNA fingerprint patterns. Investigators are using data from PulseNet, the national subtyping network made up of state and local public health laboratories and federal food regulatory laboratories that performs molecular surveillance of foodborne infections. The outbreak strain of *Salmonella* Heidelberg is resistant to several commonly prescribed antibiotics. This antibiotic resistance may be associated with an increase in the risk of hospitalization or possible treatment failure in infected individuals.

A total of 129 persons infected with the outbreak strain of *Salmonella* Heidelberg have been reported from in 34 states with illness onset dates between February 27 and September 13, 2011. The number of ill persons identified in each state is as follows: Alabama (1), Arkansas (1), Arizona (3), California (6), Colorado (4), Connecticut (1), Georgia (2), Illinois (16), Indiana (1), Iowa (2), Kansas (3), Kentucky (2), Louisiana (1), Massachusetts (3), Maryland (1), Michigan (12), Minnesota (2), Mississippi (2), Missouri (7), Nebraska (2), Nevada (1), New Jersey (1), New York (2), North Carolina (4), Ohio (12), Oklahoma (2), Oregon (1), Pennsylvania (6), South Dakota (3), Tennessee (2), Texas (17), Utah (1), Vermont (1), and Wisconsin (4).

Among persons for whom information is available, illnesses began on or after February 27, 2011. Ill persons range in age from less than 1 year to 90 years old, with a median age of 23 years old. Fifty-six percent are male. Among the 88 ill persons with available information, 33 (38%) have been hospitalized. One death has been reported.

The outbreak can be visually described with a chart showing the number of people who became ill each day or week. This chart is called an epi curve. This pattern has been seen before in PulseNet, and in the past typically

caused 2-3 cases per month. PulseNet received reports of a small number of cases with the outbreak strain in March 2011, and reported cases increased in mid-May and late June. Illnesses that occurred after September 1, 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. Please see the [Timeline for Reporting of Salmonella Cases](#) for more details.

## Investigation of the Outbreak

Collaborative investigative efforts of state, local, and federal public health and regulatory agencies indicate that ground turkey is the likely source of this outbreak. Among the 88 ill persons with available information, 47 (53%) reported consuming ground turkey. This proportion is significantly higher than results from a [survey](#) of healthy persons in which 11% of persons interviewed reported consuming ground turkey in the 7 days before they were interviewed. Product information (such as date and location of purchase of ground turkey) is also being collected from ill persons and is being used by local, state, and federal public health, agriculture, and regulatory agencies to further the investigation.

Cultures of five ground turkey samples purchased from five retail locations between March 7 and June 27, 2011, yielded *Salmonella* Heidelberg with the outbreak strain. PFGE patterns from these *Salmonella* bacteria were added to the PulseNet database between April 11 and July 12, approximately a month after each sample was collected. Preliminary information indicates that all of these products originated from a common food-production establishment (Cargill Meat Solutions Corporation in Springdale, Arkansas). These products were obtained as part of routine sampling in the National Antimicrobial Resistance Monitoring System ([NARMS](#)) and are not linked to illnesses.

This is a multi-drug resistant strain of *Salmonella* Heidelberg. As of September 12, 2011, investigators had collected antibiotic resistance information on isolates from 12 samples of ground turkey collected at retail and from 23 ill persons infected with the outbreak strain of *Salmonella* Heidelberg. The isolates from the ground turkey samples are resistant to antibiotics including ampicillin, streptomycin, tetracycline, and gentamicin. The sensitivity testing results, to date, indicate that isolates from humans are also resistant to ampicillin and tetracycline, and some are resistant to streptomycin and gentamicin; however, the testing is not complete for all isolates. All human isolates are sensitive to several common antibiotics that are used in clinical practice such as ciprofloxacin, ceftriaxone, and trimethoprim-sulfamethoxazole. Antimicrobial resistance may increase the risk of hospitalization or possible treatment failure in infected individuals.

A sample of leftover unlabeled frozen ground turkey was collected by public health officials from the home of an ill person in Ohio infected with the outbreak strain of *Salmonella* Heidelberg. Culture of the ground turkey sample yielded the outbreak strain on July 29, 2011. In addition to the outbreak strain, with the "initial" PGFE pattern, a *Salmonella* Heidelberg with a second closely related PFGE pattern of was identified in the contaminated leftover product. Since February 27, 2011, a total of 27 ill persons have been reported to PulseNet with this closely related PGFE pattern. Among the 13 such patients who have been interviewed to date, 12 (92%) report consumption of ground turkey in the week before their illness began. The closely related PGFE pattern was also found in a retail sample of ground turkey taken as part of NARMS surveillance. This retail sample originated from Cargill Meat Solutions Corporation establishment in Springdale, Arkansas. Based on these findings, the 27 ill persons with this second closely related PFGE pattern of *Salmonella* Heidelberg have been included in the total count of outbreak cases.

On July 29, 2011, USDA-FSIS released a public health alert for frozen or fresh ground turkey products. This alert reminds consumers of the critical importance of following package cooking instructions for frozen or fresh ground turkey products and general food safety guidelines when handling and preparing any raw meat or poultry. The alert advises that, while cooking instructions may give a specific number of minutes of cooking for each side of the patty in order to attain 165°F internal temperature, consumers should be aware that actual time may vary depending on the cooking method (broiling, frying, or grilling) and the temperature of the product (chilled versus frozen). Therefore, it is important that the final temperature of 165 °F must be reached for safety. The alert recommends that consumers not rely on the cooking time for each side of the patty, but use a food thermometer. For more information on this public health alert, please see [FSIS Issues Public Health Alert for Frozen, Fresh Ground Turkey Products](#).

## Clinical Features/Signs and Symptoms

Most persons infected with *Salmonella* bacteria 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. Older adults, infants, and those with impaired immune systems are more likely to have a severe illness from *Salmonella* infection. More general information about *Salmonella* can be found [here](#).

## Recall

On August 3, 2011, Cargill Meat Solutions Corporation, a Springdale, Arkansas, establishment, [recalled](#) approximately 36 million pounds of ground turkey products that may be contaminated with a multi-drug resistant strain of *Salmonella* Heidelberg. The products subject to recall are all ground turkey and bear the establishment number "P-963" inside the USDA mark of inspection.



On September 11, 2011, Cargill Meat Solutions Corporation [recalled](#) another 185,000 pounds of ground turkey products after product samples at the plant tested positive for the outbreak strain of *Salmonella* Heidelberg based on sample results from an intensive in-plant investigation performed by FSIS. On September 27, 2011 [FSIS reported](#) that one positive sample was confirmed to have the outbreak strain and the isolate was multidrug resistant.

## Advice to Consumers, Retailers, and Others

- Consumers should check their homes for [recalled ground turkey products](#) and not eat them; restaurant and food service operators should not serve it. Consumers with questions about recalled ground turkey products may contact Cargill's consumer relations toll free telephone number (1-888-812-1646).
- Wash hands, kitchen work surfaces, and utensils with soap and water immediately after they have been in contact with raw meat or poultry including frozen and fresh ground turkey. Then, disinfect the food contact surfaces using a freshly prepared solution of 1 tablespoon unscented liquid chlorine bleach to 1 gallon of water.
- Cook poultry thoroughly. Ground turkey and ground turkey dishes should always be cooked to 165 °F internal temperature as measured with a food thermometer; leftovers also should be reheated to 165 °F. The color of cooked poultry is not always a sure sign of its safety. Only by using a food thermometer can one accurately determine that poultry has reached a safe minimum internal temperature of 165 °F throughout the product. Turkey can remain pink even after cooking to a safe minimum internal temperature of 165 °F. The meat of smoked turkey is always pink. Be particularly careful with foods prepared for infants, older adults, and persons with impaired immune systems. For more information, please visit [FoodSafety.gov](#).
- If served undercooked poultry in a restaurant, send it back to the kitchen for further cooking.
- Avoid cross-contaminating other foods. Uncooked meats and poultry should be kept separate from produce, cooked foods, and ready-to-eat foods. Hands, cutting boards, counters, knives, and other utensils should be washed thoroughly after touching uncooked foods. Hands should be washed before handling food, and between handling different food items.
- Refrigerate raw and cooked meat and poultry within 2 hours after purchase (1 hour if temperatures exceed 90° F). Refrigerate cooked meat and poultry within 2 hours after cooking. Refrigerators should be set to maintain a temperature of 40 °F or below.
- Persons who think they might have become ill from eating possibly contaminated ground turkey should consult their health care providers. Infants, older adults, and persons with impaired immune systems are more likely than others to develop severe illness.

## Key Resources

- [Arkansas Firm Recalls Ground Turkey Products Due to Possible \*Salmonella\* Contamination](#)
- [FSIS Issues Public Health Alert for Frozen, Fresh Ground Turkey Products](#)
- [FoodSafety.gov](#)

- [FSIS Fact Sheet on Safe Food Handling: How Temperatures Affect Food](#) 
- [AskKaren.gov \(FSIS virtual representative\)](#) 
- [General Information: \*Salmonella\*](#)
- [Description of the Steps In a Foodborne Outbreak Investigation](#)
- [CDC's Role During a Multi-State Foodborne Outbreak Investigation](#)
- 1-888-MPHotline (1-888-674-6854), USDA English/Spanish Meat and Poultry Hotline
- 800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, 24 Hours/Every Day

## CDC's Role in Food Safety

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 the U.S. Food and Drug Administration and USDA-FSIS. 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.

## Previous Updates

[September 14, 2011](#)

[August 18, 2011](#)

[August 11, 2011](#)

[August 4, 2011](#)

[August 1, 2011](#)

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