

Outbreak of Multidrug-Resistant *Salmonella* Infections Linked to Raw Turkey Products

Final Update



Investigation Notice

April 30, 2019 at 11:30 AM ET

This is the final update for this outbreak investigation. The number of reported new illnesses has decreased, but people could continue to get sick. People can get a *Salmonella* infection from eating undercooked turkey or touching raw turkey, including packaged raw pet food. Always cook turkey thoroughly. Get CDC's tips to [prevent foodborne illness from turkey](#). CDC continues to monitor the PulseNet database for illnesses and work with states to interview ill people. CDC's [National Antimicrobial Resistance Monitoring System \(NARMS\)](#) continues to analyze *Salmonella* isolates for patterns of antibiotic resistance.

CDC, the U.S. Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS), and public health and regulatory officials in several states investigated a multistate outbreak of multidrug-resistant *Salmonella* infections linked to raw turkey products. CDC will continue to monitor for reports of ill people because this *Salmonella* strain is present in the turkey industry.

Final Outbreak Information

At A Glance

- [Reported Cases](#): 358
- [States](#): 42
- Hospitalizations: 133
- Deaths: 1
- Recall: Yes
- Available information indicates the outbreak strain of *Salmonella* Reading is present in live turkeys and in many types of raw turkey products. CDC and USDA-FSIS shared this information with representatives from the turkey industry, including the National Turkey Federation, and requested that they take steps to reduce *Salmonella* contamination.
 - This is the final update for this outbreak investigation. The number of reported new illnesses has decreased, but people could continue to get sick.
 - This outbreak strain could remain present in live turkeys and raw turkey products until actions from industry further reduce *Salmonella* Reading contamination.

- A total of 358 people infected with the outbreak strain of *Salmonella* Reading were reported from 42 states.
 - 133 people were hospitalized. One death was reported.
 - The last reported illness began on March 31, 2019.
- [Epidemiologic and laboratory evidence](#) indicated that many types of turkey products from a variety of sources are contaminated with *Salmonella* Reading and are making people sick.
 - The outbreak strain was identified in samples taken from raw turkey products, raw turkey pet food, and live turkeys.
 - Several turkey products have been recalled because they might have been contaminated with *Salmonella*. Please see the list of recalled items below.
 - Available information indicates these recalled products do not account for the whole outbreak.
- A single, common supplier of raw turkey products or of live turkeys was not identified.
- The Public Health Agency of Canada has identified ill people in Canada infected with *Salmonella* Reading bacteria with the same DNA fingerprint.
- CDC will provide updates in the future if there is an increase in newly reported cases.

Advice to Consumers and Retailers

Advice

Always handle raw turkey carefully and cook it thoroughly to prevent food poisoning. Raw turkey products can have germs that spread around food preparation areas and can make you sick.

With the exception of the recalled turkey products, CDC is not advising that consumers avoid eating properly cooked turkey products, or that retailers stop selling raw turkey products.

CDC advises consumers to follow these steps to help prevent *Salmonella* infection from raw turkey:

- **Wash your hands.** *Salmonella* infections can spread from one person to another. Wash hands before and after handling raw turkey products.
- **Cook raw turkey thoroughly to kill harmful germs.** Turkey breasts, whole turkeys, and ground poultry, including turkey burgers, casseroles, and sausage, should always be cooked to an internal temperature of 165°F to kill harmful germs. Leftovers should be reheated to 165°F. [Use a food thermometer to check, and place it in the thickest part of the food](#).
- **Don't spread germs from raw turkey around food preparation areas.** Washing raw poultry before cooking is not recommended. Germs in raw poultry juices can spread to other areas and foods. Thoroughly wash hands, counters, cutting boards, and utensils with warm, soapy water after they touch raw turkey. Use a separate cutting board for raw turkey and other raw meats if possible.
- **CDC does not recommend feeding [raw diets to pets](#).** Germs like *Salmonella* in raw pet food can make your pets sick. Your family also can get sick by handling the raw food or by taking care of your pet.

Recalls

Do not eat, sell, or serve recalled turkey products:

Ground Turkey

- Jennie-O Turkey Store Sales, LLC, in Faribault, Minnesota recalled approximately 164,210 pounds of raw ground turkey products on December 21, 2018. The recalled ground turkey was sold in 1-pound, 2.5-pound and 3-pound packages labeled with establishment number “P-579”. This is found on the side of the product tray package.
- Jennie-O Turkey Store Sales, LLC, in Barron, Wisconsin recalled approximately 147,276 pounds of raw ground turkey products on November 15, 2018. The recalled ground turkey was sold in one-pound packages labeled with establishment number “P-190”. This is found inside the USDA mark of inspection.

Pet Food

- Woody’s Pet Food Deli in Minnesota recalled raw turkey pet food on January 28, 2019. The recalled product was sold in 5-pound plastic containers labeled “Woody’s Pet Food Deli Raw Free Range Turkey” and was sold in Minnesota.
- Raws for Paws of Minneapolis, MN recalled approximately 4,000 pounds of its 5 pounds and 1 pound chubs of Ground Turkey Pet Food on February 5, 2018.

Symptoms of *Salmonella* Infection

- Most people infected with *Salmonella* develop diarrhea, fever, and stomach cramps 12 to 72 hours after being exposed to the bacteria.
- The illness usually lasts 4 to 7 days, and most people recover without treatment.
- In some people, 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 places in the body.
- In rare cases, *Salmonella* infection can cause death unless the person is treated promptly with antibiotics.
- Children younger than 5 years of age, adults older than 65 years of age, and people with weakened immune systems are more likely to have severe illness.
- For more information, see the CDC Salmonella website.

Investigation Details

April 30, 2019

CDC, the U.S. Department of Agriculture’s Food Safety Inspection Service (USDA-FSIS), and public health and regulatory officials in several states investigated a multistate outbreak of *Salmonella* Reading infections linked to raw turkey products.

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

bacteria isolated from ill people by using techniques called [pulsed-field gel electrophoresis](#) (PFGE) and [whole genome sequencing](#) (WGS). CDC PulseNet manages a national database of these DNA fingerprints to identify possible outbreaks. WGS gives a more detailed DNA fingerprint than PFGE. WGS performed on *Salmonella* from ill people in this outbreak showed that they are closely related genetically. This means that the ill people were more likely to share a common source of infection.

As of April 22, 2019, a total of 358 people infected with the outbreak strain of *Salmonella* Reading were reported from 42 states and the District of Columbia.

Illnesses started on dates from [November 20, 2017, to March 31, 2019](#). Ill people ranged in age from less than 1 year to 101, with a median age of 42. Forty-eight percent of ill people were female. Of 302 people with information available, 133 (44%) were hospitalized. One death was reported from California.

[Predicted antibiotic resistance](#) based on whole genome sequencing (WGS) was determined for 487 isolates. There was no antibiotic resistance predicted for 173 (36%) isolates from 86 ill people and 87 food, animal, and environmental samples. The remaining 314 isolates (180 from ill people and 134 from food, animal, and environmental samples) contained genes for resistance or decreased susceptibility to some or all of the following antibiotics: ampicillin (52% of all 487 isolates), streptomycin (32%), sulfamethoxazole (31%), tetracycline (32%), kanamycin (3.4%), gentamicin (0.6%), nalidixic acid (0.4%), ciprofloxacin (0.4%), trimethoprim-sulfamethoxazole (0.4%), and fosfomycin (0.2%). Testing of 20 outbreak isolates using standard [antibiotic susceptibility testing](#) by CDC's [National Antimicrobial Resistance Monitoring System \(NARMS\)](#) laboratory confirmed these results (fosfomycin and kanamycin were not tested by this method). Most (99%) of the human infections in this outbreak were susceptible to the antibiotics that are commonly used for treatment when susceptibility results are not available. These results mean that this resistance likely will not affect the choice of antibiotics used for treatment.

Investigation of the Outbreak

State and local health departments interviewed ill people [about the foods they ate and other exposures](#) in the week before they became ill. Of the 200 ill people interviewed, 130 (65%) reported preparing or eating turkey products that were purchased raw, including ground turkey, turkey pieces, and whole turkeys. Ill people reported buying many different brands of raw turkey products from multiple stores. Also, 4 of the 200 ill people interviewed became sick after pets in their home ate raw ground turkey pet food. Five of the 200 ill people interviewed worked in a facility that raises or processes turkeys, or lived with someone who did. In February 2019, 47 people became ill after eating turkey that was not handled properly at an event in Iowa.

Public health officials in Arizona and Michigan collected unopened Jennie-O brand ground turkey from the homes of ill people. Officials in Minnesota also collected raw turkey pet food that was served to pets in ill people's homes. The outbreak strain of *Salmonella* Reading was identified in samples of the ground turkey and the raw turkey pet food. WGS showed that *Salmonella* bacteria isolated from ill people, from ground turkey, and from raw turkey pet food were all closely related genetically. These results provided more evidence that people in this outbreak got sick from eating or handling turkey products.

Several Jennie-O brand ground turkey products were recalled in November and December 2018. Raws for Paws recalled raw turkey pet food in February 2018, and Woody's Pet Food Deli recalled raw turkey pet food in January 2019.

The outbreak strain was also identified in samples from raw turkey products from 24 slaughter and 14 processing establishments. The samples collected by FSIS at these slaughter and processing establishments were part of FSIS's routine testing under the *Salmonella* performance standards. Furthermore, WGS showed that the *Salmonella* strain isolated from these samples is closely related genetically to the *Salmonella* strain from ill people.

Available data indicate that this strain of *Salmonella* Reading is present in live turkeys and in raw turkey products. A single, common supplier of raw turkey products or of live turkeys was not identified that could account for the whole outbreak.

This is the final update for this outbreak investigation. The number of reported new illnesses has decreased, but people could continue to get sick. CDC continues to monitor the PulseNet database for illnesses and work with states to interview ill people. CDC's [National Antimicrobial Resistance Monitoring System \(NARMS\)](#) continues to analyze *Salmonella* isolates for patterns of antibiotic resistance. CDC will provide updates in the future if there is an increase in newly reported cases.