

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

Final Update



Investigation Notice

Posted February 21, 2019 at 3:00 PM ET

This investigation is over. Illnesses could continue because this *Salmonella* strain appears to be widespread in the chicken industry. People can get a *Salmonella* infection from eating undercooked chicken or touching raw chicken, including packaged raw pet food. Always cook chicken thoroughly. Get CDC's tips to [prevent foodborne illness from chicken](#).

CDC and public health and regulatory officials in several states investigated a multistate outbreak of multidrug-resistant [Salmonella](#) infections linked to raw chicken products. The U.S. Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS) monitored the outbreak.

Final Outbreak Information

At A Glance

- [Reported Cases](#): 129
 - [States](#): 32
 - Hospitalizations: 25
 - Deaths: 1
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- As of February 21, 2019 this investigation is over.
 - A total of 129 people infected with the outbreak strain of *Salmonella* Infantis were reported from 32 states.

- Twenty-five people were hospitalized. One death was reported from New York.
- [Epidemiologic and laboratory evidence](#) indicated that many types of raw chicken products from a variety of sources are contaminated with *Salmonella* Infantis and are making people sick.
 - In interviews, ill people reported eating different types and brands of chicken products purchased from many different locations.
 - The outbreak strain was identified in samples taken from raw chicken products, raw chicken pet food, and live chickens.
- Antibiotic resistance testing conducted by CDC on *Salmonella* bacteria isolated from ill people showed that the outbreak strain is resistant to multiple antibiotics. For more information read the [advice to clinicians](#).
- A single, common supplier of raw chicken products or of live chickens was not identified.
- The outbreak strain of *Salmonella* Infantis is present in live chickens and in many types of raw chicken products, indicating it might be widespread in the chicken industry. CDC and USDA-FSIS shared this information with representatives from the chicken industry and requested that they take steps to reduce *Salmonella* contamination.

Advice to Consumers and Retailers

Always [handle raw chicken carefully](#) and cook it thoroughly to prevent food poisoning. This outbreak is a reminder that raw chicken can have germs that can spread around your kitchen and make you sick. Although the outbreak investigation is over, the outbreak strain appears to be widespread in chicken and people may continue to get sick.

CDC is not advising that consumers avoid eating properly cooked chicken, or that retailers stop selling raw chicken products.

Follow these steps to help prevent *Salmonella* or other foodborne infections from chicken:

- **Wash your hands.** Wash hands before and after handling raw chicken products, including packaged raw pet food. Wash hands after contact with animals and after using the bathroom.
- **Cook raw chicken thoroughly to kill harmful germs.** Chicken breasts, whole chickens, and ground poultry, including chicken burgers and chicken 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 meat](#)[External](#). For burgers and sausage, insert the thermometer in the side, with the tip reaching the center of the food.

- **Don't spread germs from raw chicken around your kitchen.** Do not [wash raw poultry](#)[External](#). Germs in raw poultry juices can spread to countertops, utensils, and other foods. Use a separate cutting board for raw chicken and other raw meats if possible. Wash cutting boards, utensils, dishes, and countertops with hot soapy water after preparing chicken and before you prepare the next item.
- **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.

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, visit the CDC [Salmonella](#) website.

Investigation Details

February 21, 2019

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

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* bacteria from ill people in this outbreak showed that they were closely related genetically. This means that the ill people were more likely to share a common source of infection.

As of February 19, 2019, 129 people infected with the outbreak strain of *Salmonella* Infantis were reported from 32 states. A list of the states and the number of cases in each can be found on the [Map of Reported Cases](#) page.

Illnesses started from January 8, 2018, to January 27, 2019. Ill people ranged in age from less than 1 year to 105, with a median age of 42. Sixty-nine percent of ill people were female. Of 85 people with information available, 25 (29%) were hospitalized. One death was reported from New York.

In interviews, ill people answered [questions about the foods they ate and other exposures](#) in the week before they became ill. Of 69 people interviewed, 60 people (87%) reported preparing or eating chicken products that were purchased raw, including ground chicken, chicken pieces, and whole chicken. Ill people reported buying many different brands of raw chicken products from multiple stores. One person got sick after pets in their home ate [raw ground chicken pet food](#)^{External}. Two ill people lived with someone who works in a facility that raises or processes chickens.

The outbreak strain of *Salmonella* Infantis has been identified in samples from raw chicken products from 76 slaughter and/or processing establishments, from raw chicken pet food, and from live chickens. Samples collected at slaughter and processing establishments were collected as part of FSIS's routine testing under the *Salmonella* performance standards. WGS showed that the *Salmonella* strain from these samples was closely related genetically to the *Salmonella* from ill people. This result provided more evidence that people in this outbreak got sick from handling or eating raw or undercooked chicken.

WGS analysis of *Salmonella* bacteria isolated from 97 ill people and 139 food or environmental samples predicted resistance to some or all of the following antibiotics: ampicillin, ceftriaxone, chloramphenicol, ciprofloxacin, fosfomycin, gentamicin, hygromycin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, and trimethoprim-sulfamethoxazole. Four non-clinical isolates had no predicted resistance. Testing of seven isolates using [standard antibiotic susceptibility testing](#) by CDC's [National Antimicrobial Resistance Monitoring System \(NARMS\)](#) laboratory confirmed these results (fosfomycin, hygromycin, and kanamycin were not tested by this method). These antibiotic-resistant infections may be difficult to treat with commonly recommended antibiotics, and may require a different antibiotic choice. [Advice to clinicians is available](#).

Available data indicate that this strain of *Salmonella* Infantis appears to be present in live chickens and in raw chicken products. A single, common supplier of raw chicken products or of live chickens was not identified.

CDC and USDA-FSIS are actively engaging with representatives from the chicken industry to explore ways to reduce *Salmonella* Infantis in chicken products. Because investigation results suggest this strain of *Salmonella* Infantis is present in both live chickens and in raw chicken products, further investigation and interventions to reduce the prevalence of this strain should target both the live chicken industry and chicken processing facilities. Consumers should be aware that raw chicken may be contaminated with harmful germs. Always follow [food safety steps](#) to prevent foodborne infection from these products.

As of February 21, 2019, this investigation is over.