



Salmonella

Multistate Outbreak of *Salmonella* Infections Linked to Organic Sprouted Chia Powder (Final Update)

Posted August 13, 2014 2:30 PM ET

This outbreak appears to be over. However, *Salmonella* is an important cause of human illness in the United States. More information about *Salmonella*, and steps people can take to reduce their risk of infection, can be found on the [CDC *Salmonella* Web Page \(/salmonella/index.html\)](/salmonella/index.html).

At a Glance:



- **Case Count: 31** (</salmonella/newport-05-14/epi.html>)
- **States: 16** (</salmonella/newport-05-14/map.html>)
- **Deaths: 0**
- **Hospitalizations: 5**
- **Recall: Yes** (</salmonella/newport-05-14/advice-consumers.html>)

More Information:

- [Recalls & Advice to Consumers \(/salmonella/newport-05-14/advice-consumers.html\)](/salmonella/newport-05-14/advice-consumers.html)
- [Signs & Symptoms \(/salmonella/newport-05-14/signs-symptoms.html\)](/salmonella/newport-05-14/signs-symptoms.html)
- [Key Resources \(/salmonella/newport-05-14/key-resources.html\)](/salmonella/newport-05-14/key-resources.html)

Highlights

- **[Read the Advice to Consumers» \(/salmonella/newport-05-14/advice-consumers.html\)](/salmonella/newport-05-14/advice-consumers.html)**
- This outbreak appears to be over.
- A total of 31 persons infected with the outbreak strains of *Salmonella* Newport (20 persons), *Salmonella* Hartford (7 persons), or *Salmonella* Oranienburg (4 persons) were reported from 16 states.
 - Five ill persons were hospitalized. No deaths were reported.
- Collaborative investigation efforts of state, local, and federal public health and regulatory agencies indicated that organic sprouted chia powder was the likely source of this outbreak.
 - Sprouted chia powder is made from chia seeds that are sprouted, dried, and ground.
- CDC's [National Antimicrobial Resistance Monitoring System \(/narms/index.html\)](/narms/index.html) (NARMS) laboratory conducted antibiotic resistance testing on *Salmonella* isolates collected from four ill persons infected with *Salmonella* Hartford or Newport.
 - All isolates were pansusceptible (susceptible to all antibiotics tested).
- As a result of this investigation, several [recalls \(/salmonella/newport-05-14/advice-consumers.html#recall\)](/salmonella/newport-05-14/advice-consumers.html#recall) of products containing organic sprouted chia powder and chia seeds were issued.
- Although the outbreak appears to be over, these products have a long shelf life and may still be in people's homes. Consumers unaware of the recall could continue to eat the products and potentially get sick.

- CDC recommends that consumers do not eat any of the recalled products containing organic sprouted chia powder or chia seeds.
- The recalled products were available for purchase in many retail stores nationwide and online.
- The Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php>)  (<http://www.cdc.gov/Other/disclaimer.html>) investigated similar cases of *Salmonella* infection in several Canadian provinces.
 - Several Canadian companies recalled (<http://healthycanadians.gc.ca/recall-alert-rappel-avis/inspection/2014/39917r-eng.php>)  (<http://www.cdc.gov/Other/disclaimer.html>) products containing sprouted chia powder or chia seeds.
- *Salmonella* is an important cause of human illness in the United States. More information about *Salmonella*, and steps people can take to reduce their risk of infection, can be found on the CDC Salmonella Web Page (</salmonella/index.html>).

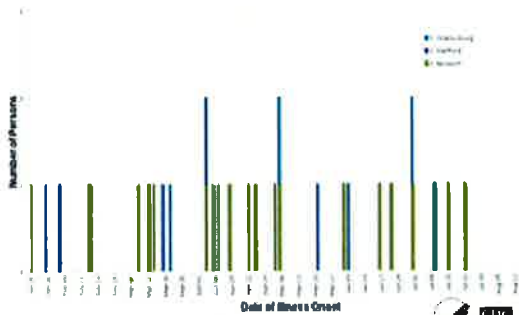
Final Case Count Map



[\(/salmonella/newport-05-14/map.html\)](/salmonella/newport-05-14/map.html)

Click map to view updated & previous case count maps. (</salmonella/newport-05-14/map.html>)

Final Epi Curve



[\(/salmonella/newport-05-14/epi.html\)](/salmonella/newport-05-14/epi.html) [\(/salmonella/newport-](/salmonella/newport-05-14/epi.html)

[05-14/epi.html\)](/salmonella/newport-05-14/epi.html)

Click graph to view updated & previous epi curve graphs. (</salmonella/newport-05-14/epi.html>)

Outbreak Summary

Introduction

CDC collaborated with public health officials in several states, the U.S. Food and Drug Administration (FDA), and the Public Health Agency of Canada (PHAC) to investigate a multistate outbreak of *Salmonella* Newport, Hartford, and Oranienburg infections. Results from the investigation indicated that organic sprouted chia powder was the likely source of this outbreak. Sprouted chia powder is made from chia seeds that are sprouted, dried, and ground.

Public health investigators used the PulseNet (</pulsenet/index.html>) system to identify cases of illness that were part of this outbreak. PulseNet, the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC, receives DNA

"fingerprints" of *Salmonella* bacteria obtained through diagnostic testing using pulsed-field gel electrophoresis, or PFGE.

A total of 31 ill persons infected with the outbreak strains of *Salmonella* Newport (20 persons), *Salmonella* Hartford (7 persons), or *Salmonella* Oranienburg (4 persons) were reported from 16 states. The number of ill persons identified in each state was as follows: Arizona (1), California (4), Colorado (1), Connecticut (3), Florida (1), Illinois (2), Maryland (1), Massachusetts (1), Michigan (1), New York (7), Ohio (1), Rhode Island (1), Texas (2), Utah (1), Washington (1), and Wisconsin (3).

Among persons for whom information was available, dates that illnesses began ranged from January 21, 2014, to July 22, 2014. Ill persons ranged in age from 1 year to 81 years, with a median age of 48 years. Sixty-one percent of ill persons were female. Among 23 ill persons with available information, five (22%) were hospitalized. No deaths were reported.

Investigation of the Outbreak

Epidemiologic, laboratory, and traceback investigations conducted by officials in several states, CDC, FDA, and Canada linked this outbreak of *Salmonella* infections to various brands of products containing chia. The Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php>) [☞](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>) investigated similar cases of *Salmonella* infection in several Canadian provinces.

Three different *Salmonella* serotypes were identified as part of this outbreak: *Salmonella* Newport, *Salmonella* Hartford, and *Salmonella* Oranienburg. The initial outbreak investigation used PulseNet (</pulsenet/index.html>) to identify a cluster of 12 persons infected with a strain of *Salmonella* Newport. This strain of *Salmonella* Newport had never been seen before in PulseNet. Through a collaborative investigation with the Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php>) [☞](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>), an additional five ill persons infected with a strain of *Salmonella* Hartford matching an outbreak strain in Canada were identified through PulseNet in five U.S. states. This strain of *Salmonella* Hartford had also never been seen before in PulseNet. Finally, product testing of a sample of leftover organic sprouted chia powder collected from an ill person's home in Connecticut isolated the third serotype, *Salmonella* Oranienburg. Two additional ill persons infected with the same strain were identified through PulseNet. This strain of *Salmonella* Oranienburg had been seen before in PulseNet, averaging one case per month.

In interviews, 21 ill persons answered questions about foods eaten and other exposures in the week before becoming ill. Nineteen (90%) of them reported eating chia seeds or powder; of those 19 persons, 15 (79%) reported eating chia powder specifically. Traceback of the products reported by ill persons identified Bioessential Botanicals, a Canadian firm, as a common supplier of organic sprouted chia powder used in these products.

Multiple products containing chia seed and chia powder were [recalled](/salmonella/newport-05-14/advice-consumers.html#recall) as a result of this outbreak investigation. On June 11, 2014, the FDA placed the Canadian firm, Bioessential Botanicals, on [Import Alert](http://www.accessdata.fda.gov/cms_ia/importalert_263.html) (http://www.accessdata.fda.gov/cms_ia/importalert_263.html) [☞](http://www.cdc.gov/Other/disclaimer.html) (<http://www.cdc.gov/Other/disclaimer.html>). The Import Alert informs FDA field personnel that FDA has sufficient evidence or other information to detain future shipments of chia seeds and sprouted seed powder from this supplier. This means that chia seeds and sprouted chia powder from this firm would be denied admission into the United States unless the importer provided evidence that these products are not contaminated with *Salmonella*, such as through results from private laboratory tests of the products.

Laboratory testing conducted by state public health laboratories in California, Connecticut, Massachusetts, New York, Utah, Washington, and Wisconsin isolated the outbreak strains of *Salmonella* Newport, *Salmonella* Hartford, and *Salmonella* Oranienburg from leftover recalled products containing chia powder provided by ill persons. Testing of unopened products conducted by California, Connecticut, and New York, and FDA and the Canadian Food Inspection Agency also identified the outbreak strains in products containing chia powder. All samples that yielded outbreak strains were from recalled products.

The National Antimicrobial Resistance Monitoring System (NARMS) is a U.S. public health surveillance system that tracks antibiotic resistance in foodborne and other enteric bacteria found in people, retail meats and poultry, and food-producing animals. NARMS is an interagency partnership among CDC, the U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and state and local health departments.

The [NARMS human surveillance program \(/narms/index.html\)](/narms/index.html) at CDC monitors antibiotic resistance in *Salmonella* and other bacteria isolated from clinical specimens submitted to NARMS by public health laboratories. CDC's NARMS laboratory conducted antibiotic resistance testing on four isolates collected from ill persons infected with the outbreak strains of *Salmonella* Hartford (two isolates) or *Salmonella* Newport (two isolates). All four isolates tested were pansusceptible (susceptible to all antibiotics tested).

August 13, 2014

Final Case Count Update

A total of 31 ill persons infected with the outbreak strains of *Salmonella* Newport (20 persons), *Salmonella* Hartford (7 persons), or *Salmonella* Oranienburg (4 persons) were reported from 16 states. Since the last update on July 17, 2014, six additional ill persons were reported from California (1), Illinois (2), Maryland (1), and New York (2). The total number of ill persons identified in each state was as follows: Arizona (1), California (4), Colorado (1), Connecticut (3), Florida (1), Illinois (2), Maryland (1), Massachusetts (1), Michigan (1), New York (7), Ohio (1), Rhode Island (1), Texas (2), Utah (1), Washington (1), and Wisconsin (3).

Among persons for whom information was available, dates that illnesses began ranged from January 21, 2014, to July 22, 2014. Ill persons ranged in age from 1 year to 81 years, with a median age of 48 years. Sixty-one percent of ill persons were female. Among 23 ill persons with available information, five (22%) were hospitalized. No deaths were reported.

This outbreak appears to be over. However, these products have a long shelf life and may still be in people's homes. Consumers unaware of the recall could continue to eat the products and potentially get sick.

July 17, 2014

Case Count Update

As of July 14, 2014, a total of 25 ill persons infected with the outbreak strains of *Salmonella* Newport (16 persons), *Salmonella* Hartford (7 persons), or *Salmonella* Oranienburg (2 persons) have been reported from 14 states. Since the last update on June 11, 2014, 4 additional ill persons have been reported from New York (1), Rhode Island (1), and Texas (2).

Among persons for whom information is available, dates that illnesses began range from January 21, 2014 to June 21, 2014. Ill persons range in age from 1 year to 81 years, with a

median age of 45 years. Sixty percent of ill persons are female. Among 20 ill persons with available information, three (15%) report being hospitalized. No deaths have been reported.

Illnesses that occurred after June 27, 2014, might not yet be reported 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 4 weeks. The recalled products containing organic sprouted chia powder have a long shelf life and may still be in people's homes, and illnesses may continue to be reported. Please see the [Timeline for Reporting Cases of Salmonella Infection \(/salmonella/outbreaks/reporting_timeline.html\)](/salmonella/outbreaks/reporting_timeline.html) for more details.

Investigation Update

Epidemiologic and traceback findings have linked this outbreak of *Salmonella* infections to various brands of organic sprouted chia powder.

FDA (<http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm399235.htm>) <http://www.cdc.gov/Other/disclaimer.html> laboratory sampling identified *Salmonella* Gaminara from one sample of Organic Traditions Sprouted Chia Seed Powder. A search of the PulseNet database did not identify any human isolates matching this pattern of *Salmonella* Gaminara.

The National Antimicrobial Resistance Monitoring System (NARMS) is a U.S. public health surveillance system that tracks antibiotic resistance in foodborne and other enteric bacteria found in humans, retail meats and poultry, and food-producing animals. NARMS is an interagency partnership among CDC, the U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and state and local health departments.

The NARMS human surveillance program at CDC monitors antibiotic resistance in *Salmonella* and other bacteria isolated from clinical specimens submitted to NARMS by public health laboratories. CDC's [NARMS \(/narms/index.html\)](/narms/index.html) laboratory conducted antibiotic resistance testing on four isolates collected from ill persons infected with the outbreak strains of *Salmonella* Hartford (two isolates) and *Salmonella* Newport (two isolates). Of the four isolates tested, all were pansusceptible (susceptible to all antibiotics on the NARMS panel).

The [Public Health Agency of Canada \(http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php\)](http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php) <http://www.cdc.gov/Other/disclaimer.html> and the Canadian Food Inspection Agency continue to investigate similar cases of *Salmonella* infection in several Canadian provinces. CDC, state, local, and Canadian public health partners are continuing laboratory surveillance through PulseNet to identify additional ill persons and to interview ill persons about foods eaten before becoming ill. The U.S. Food and Drug Administration (FDA) continues to work closely with CDC and other partners in this investigation.

June 11, 2014

Case Count Update

Product testing of a sample of leftover Navitas Naturals Organic Sprouted Chia Powder collected from an ill person's home in Connecticut isolated the outbreak strains of *Salmonella* Newport and *Salmonella* Hartford, and an additional serotype, *Salmonella* Oranienburg. A search of the PulseNet database identified a total of two ill persons infected with the same strain of *Salmonella* Oranienburg in two U.S. states. This strain of *Salmonella* Oranienburg has been seen before in PulseNet, one case per month on average. Initial interviews with ill persons suggested a link to the ongoing outbreak investigation, so these illnesses have been combined with the existing *Salmonella* Newport and *Salmonella* Hartford infections previously identified.

As of June 9, 2014, a total of 21 ill persons infected with the outbreak strains of *Salmonella* Newport (13 persons), *Salmonella* Hartford (6 persons), or *Salmonella* Oranienburg (2 persons) have been reported from 12 states. The number of ill persons identified in each state is as follows: Arizona (1), California (3), Colorado (1), Connecticut (3), Florida (1), Massachusetts (1), Michigan (1), New York (4), Ohio (1), Utah (1), Washington (1), and Wisconsin (3).

Among persons for whom information is available, dates that illnesses began range from January 21, 2014 to May 21, 2014. Ill persons range in age from 1 year to 81 years, with a median age of 49 years. Sixty-two percent of ill persons are female. Among 15 ill persons with available information, 2 (13%) report being hospitalized. No deaths have been reported.

Illnesses that occurred after May 13, 2014 might not yet be reported 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 4 weeks. The recalled products containing organic sprouted chia powder have a long shelf-life and may still be in people's homes, and illnesses may continue to be reported. Please see the [Timeline for Reporting Cases of *Salmonella* Infection](/salmonella/outbreaks/reporting_timeline.html) for more details.

Investigation Update

Epidemiologic and traceback findings have linked this outbreak of *Salmonella* infections to various brands of organic sprouted chia powder.

In interviews, ill persons are answering questions about foods eaten and other exposures in the week before becoming ill. To date, 16 (100%) of 16 persons interviewed reported eating chia seeds or powder, and 11 (73%) of 15 persons who identified the type of chia product consumed reported eating chia powder specifically.

Laboratory testing conducted by public health laboratories in Connecticut, Massachusetts, and New York isolated one or more of the outbreak strains from 5 samples of leftover Navitas Naturals products containing organic sprouted chia powder collected from ill persons' homes and 2 samples of unopened Navitas Naturals products containing organic sprouted chia powder collected from retail locations.

The [Public Health Agency of Canada](http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php) (<http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php>) and the Canadian Food Inspection Agency continue to investigate similar cases of *Salmonella* infection in several Canadian provinces. CDC, state, local, and Canadian public health partners are continuing laboratory surveillance through PulseNet to identify additional ill persons and to interview ill persons about foods eaten before becoming ill. The U.S. Food and Drug Administration (FDA) is continuing to work closely with CDC and other partners in this investigation.

June 3, 2014

Case Count Update

Through a collaborative investigation with the [Public Health Agency of Canada](http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php) (<http://www.phac-aspc.gc.ca/phn-asp/2014/salmonella-nh-053114-eng.php>) (PHAC), a total of five ill persons infected with a strain of *Salmonella* Hartford matching an outbreak strain in Canada have been identified through [PulseNet](/pulsenet/index.html) (</pulsenet/index.html>) in five U.S. states. This strain of *Salmonella* Hartford has never been seen before in PulseNet. Initial interviews with ill persons suggested a link to the ongoing *Salmonella* Newport outbreak investigation in the United States. These illnesses

have been combined with the existing *Salmonella* Newport infections previously identified as part of this investigation.

As of June 2, 2014, a total of 17 ill persons infected with the outbreak strains of *Salmonella* Newport (12 persons) or *Salmonella* Hartford (5 persons) have been reported from 10 states. The number of ill persons identified in each state is as follows: Arizona (1), California (2), Connecticut (2), Ohio (1), Florida (1), Massachusetts (1), Michigan (1), New York (4), Utah (1), and Wisconsin (3).

Among persons for whom information is available, dates that illnesses began range from January 21, 2014 to May 5, 2014. Ill persons range in age from 4 years to 81 years, with a median age of 51 years. Sixty-five percent of ill persons are female. Among 13 ill persons with available information, two (15%) report being hospitalized. No deaths have been reported.

Illnesses that occurred after May 16, 2014 might not yet be reported 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 4 weeks. The recalled products containing organic sprouted chia powder have a long shelf-life and may still be in people's homes, and illnesses may continue to be reported. Please see the [Timeline for Reporting Cases of *Salmonella* Infection](/salmonella/outbreaks/reporting_timeline.html) (/salmonella/outbreaks/reporting_timeline.html) for more details.

Investigation Update

Epidemiologic and traceback findings have linked this outbreak of *Salmonella* infections to various brands of organic sprouted chia powder.

In interviews, ill persons are answering questions about foods eaten and other exposures in the week before becoming ill. To date, 12 (100%) of 12 persons interviewed reported eating chia seeds or powder, and 9 (75%) of 12 persons reported eating chia powder specifically.

On May 28, 2014, Navitas Naturals recalled (<http://www.fda.gov/Safety/Recalls/ucm399151.htm>) <http://www.cdc.gov/Other/disclaimer.html>) products that contain organic sprouted chia powder due to possible *Salmonella* contamination. The recalled products include Navitas Naturals Organic Sprouted Chia Powder, Navitas Naturals Omega Blend Sprouted Smoothie Mix, and Williams-Sonoma Omega 3 Smoothie Mixer. The recalled products are available for purchase in many retail stores and online.

On May 30, 2014, the Canadian Food Inspection Agency (CFIA) notified consumers that Advantage Health Matters and Back 2 the Garden recalled (<http://healthycanadians.gc.ca/recall-alert-rappel-avis/inspection/2014/39759r-eng.php>) <http://www.cdc.gov/Other/disclaimer.html>) various products containing sprouted chia seed powder due to possible *Salmonella* contamination. These products are sold under the brand names Organic Traditions and Back 2 the Garden and are available for purchase online by consumers in the United States.

Several samples of leftover organic sprouted chia powder from ill persons' homes and unopened packages from retail locations are being tested for the presence of *Salmonella* bacteria. Results of this testing are pending and will be released when they become available.

CDC, state, local, and Canadian public health partners are continuing laboratory surveillance through PulseNet to identify additional ill persons and to interview ill persons about foods eaten before becoming ill. The U.S. Food and Drug Administration (FDA) is continuing to work closely with CDC and other partners in this investigation.

May 29, 2014

Initial Announcement

CDC is collaborating with public health officials in several states and the U.S. Food and Drug Administration (FDA) to investigate a multistate outbreak of *Salmonella* Newport infections. Results from this ongoing investigation indicate that organic sprouted chia powder distributed by Navitas Naturals of Novato, California is the likely source of this outbreak. Chia powder is made from ground dried chia seeds.

Public health investigators are using the [PulseNet \(/pulsenet/index.html\)](http://pulsenet/index.html) system to identify cases of illness that may be part of this outbreak. PulseNet, the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC, obtains DNA "fingerprints" of *Salmonella* bacteria through diagnostic testing with pulsed-field gel electrophoresis, or PFGE, to identify cases of illness that may be part of this outbreak. This PFGE pattern has never been seen before in PulseNet.

A total of 12 ill persons infected with the outbreak strain of *Salmonella* Newport have been reported from 7 states. The number of ill persons identified in each state is as follows: Arizona (1), California (2), Connecticut (1), Massachusetts (1), New York (4), Utah (1), and Wisconsin (2).

Among persons for whom information is available, dates that illnesses began range from January 21, 2014 to May 5, 2014. Ill persons range in age from 4 years to 71 years, with a median age of 48 years. Fifty-eight percent of ill persons are female. Among ten ill persons with available information, one (10%) reports being hospitalized. No deaths have been reported.

This outbreak can be visually described with a chart showing the number of persons who became ill each day. This chart is called an [epidemic curve or epi curve \(/foodsafety/outbreaks/investigating-outbreaks/epi-curves.html\)](http://foodsafety/outbreaks/investigating-outbreaks/epi-curves.html). Illnesses that occurred after May 8, 2014 might not yet be reported 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 4 weeks. The recalled products containing organic sprouted chia powder have a long shelf-life and may still be in people's homes, and illnesses may continue to be reported. Please see the [Timeline for Reporting Cases of Salmonella Infection \(/salmonella/outbreaks/reporting_timeline.html\)](http://salmonella/outbreaks/reporting_timeline.html) for more details.

Investigation of the Outbreak

Epidemiologic and traceback findings have linked this outbreak of *Salmonella* infections to organic sprouted chia powder distributed by Navitas Naturals.

In interviews, ill persons answered questions about food eaten and other exposures in the week before becoming ill. Seven (100%) of seven persons interviewed reported eating chia powder. Six (86%) of these seven people reported eating the Navitas Naturals organic sprouted chia powder.

On May 28, 2014, Navitas Naturals [recalled \(http://www.fda.gov/Safety/Recalls/ucm309151.htm\)](http://www.fda.gov/Safety/Recalls/ucm309151.htm) [products that contain organic sprouted chia powder due to possible *Salmonella* contamination. The recalled products include Navitas Naturals Organic Sprouted Chia Powder, Navitas Naturals Omega Blend Sprouted Smoothie Mix, and Williams-Sonoma Omega 3 Smoothie Mixer. The recalled products are available for purchase in many retail stores and online.](http://www.cdc.gov/Other/disclaimer.html)

Several samples of leftover organic sprouted chia powder from ill persons' homes and unopened packages from retail locations are being tested for the presence of *Salmonella* bacteria. Results of this testing will be released when they become available.

CDC and state and local public health partners are continuing laboratory surveillance through PulseNet to identify additional ill persons and to interview ill persons about foods eaten before becoming ill. The U.S. Food and Drug Administration (FDA) is continuing to work closely with CDC and state partners in this investigation.

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