



Centers for Disease Control and Prevention

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Salmonella

Multistate Outbreak of *Salmonella* Braenderup Infections Associated with Mangoes (Final Update)

Posted October 11, 2012 3:00 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) and the [CDC Vital Signs Web Page \(/VitalSigns/FoodSafety/\)](/VitalSigns/FoodSafety/).

At a Glance:

- **Case Count: 127** (</salmonella/braenderup-08-12/epi.html>)
- **States: 15** (</salmonella/braenderup-08-12/map.html>)
- **Deaths: 0**
- **Hospitalizations: 33**
- **Recall: Yes** (</salmonella/braenderup-08-12/advice-consumers.html>)

More Information:

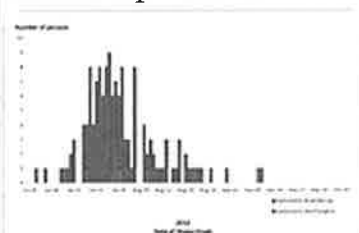
- Recall & Advice to Consumers (</salmonella/braenderup-08-12/advice-consumers.html>)
- Signs & Symptoms (</salmonella/braenderup-08-12/signs-symptoms.html>)
- Key Resources (</salmonella/braenderup-08-12/key-resources.html>)

Highlights

- **Read the Advice to Consumers »** (</salmonella/braenderup-08-12/advice-consumers.html>)
- A total of 127 persons infected with the outbreak strain of *Salmonella* Braenderup were reported from 15 states.
 - 33 ill persons were hospitalized. No deaths were reported.
- Collaborative investigation efforts of state, local, and federal public health and regulatory agencies indicated that mangoes were the source of this outbreak.
 - On September 13, FDA placed Agricola Daniella of Sinaloa, Mexico on Import Alert (<http://www.fda.gov/Food/FoodSafety/CORENetwork/ucm317337.htm>)  (<http://www.cdc.gov/Other/disclaimer.html>). This means that Agricola Daniella mangoes will be denied admission into the United States unless the importer shows they are not contaminated with *Salmonella*.
- During August 2012, CDC investigated a multistate outbreak of 16 *Salmonella* Worthington infections reported from 3 states.
 - Ill persons were reported from similar states and during the same time period as seen in the *Salmonella* Braenderup outbreak.

- 89% of ill persons with *Salmonella* Worthington who were interviewed reported consuming mangoes in the week before their illness began.
- One case in the *Salmonella* Braenderup outbreak was also infected with *Salmonella* Worthington, a finding that suggests a possible connection between the two outbreaks.
- These particular outbreaks appear to be over. However, *Salmonella* is still an important cause of human illness in the United States. More information about *Salmonella* and steps people can take to reduce their risk for infection can be found on the CDC *Salmonella* Web Page ([/salmonella/general/prevention.html](http://salmonella/general/prevention.html)) and the CDC Vital Signs Web Page ([/vitalsigns/FoodSafety/index.html](http://vitalsigns/FoodSafety/index.html)) .

Latest Epi Curve



[\(/salmonella/braenderup-08-12/epi.html\)](http://salmonella/braenderup-08-12/epi.html)

Click a link to view updated & previous epi curve graphs.



[\(/salmonella/braenderup-08-12/advice-08-12.html\)](http://salmonella/braenderup-08-12/advice-08-12.html)

Interactive State Count Map

Daniella brand mangoes product



[\(/salmonella/braenderup-08-12/map.html\)](http://salmonella/braenderup-08-12/map.html)

Outbreak Summary ↑ (#top)

Introduction

CDC collaborated with public health officials in several states and the U.S. Food and Drug Administration (FDA) to investigate a multistate outbreak of *Salmonella* Braenderup infections linked to mangoes originating from Agricola Daniella of Sinaloa, Mexico.

Public health investigators used DNA "fingerprints" of *Salmonella* bacteria obtained through diagnostic testing with pulsed-field gel electrophoresis (PFGE) to identify cases of illness that were part of this outbreak. They used data from [PulseNet \(/pulsenet/\)](http://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.

A total of 127 individuals infected with the outbreak strain of *Salmonella* Braenderup were reported from 15 states: California (99), Delaware (1), Hawaii (4), Idaho (1), Illinois (2), Maine (1), Michigan (1), Montana (1), Nebraska (1), New Jersey (1), New York (3), Oregon (1), Texas (2), Washington (8), and Wisconsin (1). This PFGE pattern has been seen before in PulseNet, and in the past typically caused 2 to 3 cases per month. Therefore, some reported cases may not be part of this outbreak.

Among 127 persons for whom information was available, illness onset dates ranged from July 3, 2012, to September 1, 2012. Ill persons ranged in age from less than 1 year to 86 years, with a median age of 33 years. Fifty-six percent of ill persons were female. Among 101 persons with available information, 33 (33%) reported being hospitalized, and no deaths were reported.

This particular outbreak appears to be over. However, *Salmonella* is still 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 \(/salmonella/general/prevention.html\)](http://salmonella/general/prevention.html) and the [CDC Vital Signs Web Page \(/vitalsigns/FoodSafety/index.html\)](http://vitalsigns/FoodSafety/index.html).

Investigation of the Outbreak

Investigation of *Salmonella* Braenderup Illnesses

Epidemiologic, laboratory, and traceback investigations conducted by officials in local, state, and federal public health, agriculture, and regulatory agencies linked this outbreak of *Salmonella* Braenderup to mangoes originating from Agricola Daniella of Sinaloa, Mexico.

In interviews, ill persons answered questions about foods consumed and other exposures during the week before becoming ill. Fifty-one (63%) of 81 ill persons interviewed reported consuming mangoes in the week before their illness began.

On August 22 and 23, 2012, the California Department of Public Health (CDPH) conducted an epidemiological study by comparing foods eaten by 37 ill persons and 46 well persons. Ill persons were asked about food consumption in the week before illness onset. Well persons were asked about food consumption during the same time period as matched ill persons. Preliminary analysis of this study indicated that eating mangoes was associated with illness. Ill persons (59%) were significantly more likely than well persons (22%) to report eating mangoes. No other type of food was associated with illness in this study.

CDPH and FDA conducted traceback investigations for mangoes purchased by ill persons to identify a common source of contamination. Traceback analysis determined that mangoes purchased by ill persons originated from Agricola Daniella of Sinaloa, Mexico.

Laboratory testing conducted by the FDA isolated *Salmonella* from four mangoes collected from warehouse locations in the United States. These four mangoes originated from Agricola Daniella of Sinaloa, Mexico. These samples did not yield *Salmonella* Braenderup and no human illnesses could be linked to the *Salmonella* serotypes isolated from these mangoes.

During July and August, 2012, a similar strain of *Salmonella* Braenderup caused 21 illnesses (<http://www.phac-aspc.gc.ca/fs-sa/phn-asp/osm-esm-eng.php>) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>) in Canada that were also linked to mangoes, leading to a recall of certain Daniella brand mangoes.

On August 29, 2012, Splendid Products of Burlingame, California, voluntarily recalled certain lots of Daniella brand mangoes (<http://www.splendidmangos.com/>) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>), a product of Sinaloa, Mexico.

On September 13, 2012, the FDA warned consumers against eating mangoes from Agricola Daniella (<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm319464.htm>) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>), a mango supplier with multiple plantations and a single packing house located in Sinaloa, Mexico. FDA placed Agricola Daniella on Import Alert (http://www.accessdata.fda.gov/cms_ia/importalert_266.html) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>). This means that Agricola Daniella mangoes will be denied admission into the United States unless the importer shows they are not contaminated with *Salmonella*, such as by using private laboratories to test the mangoes.

Investigation of *Salmonella* Worthington Illnesses

During August 2012, CDC began collaborating with public health officials in several states and the U.S. Food and Drug Administration (FDA) to investigate a multistate outbreak of 16 *Salmonella* Worthington infections from 3 states: California (12), New Mexico (1), and Washington (3). These ill persons were reported from similar states and during the same time period as seen in the *Salmonella* Braenderup outbreak. One ill person in the *Salmonella* Braenderup outbreak was also infected with *Salmonella* Worthington. In interviews with the *Salmonella* Worthington ill persons, 8 (89%) of 9 ill persons reported consuming mangoes in the week before their illness began. These data suggested a possible connection between the two outbreaks. Traceback investigations were not conducted to determine the source of mangoes for these ill persons. *Salmonella* Worthington was not isolated during laboratory testing of mangoes. These 16 cases were not included in the overall case count reported above.

Among the persons with reported dates available, illnesses with *Salmonella* Worthington began between July 19, 2012 and September 12, 2012. Infected individuals ranged in age from less than 1 year old to 86 years old, and the median age was 65 years. Sixty-three percent of patients were female. Among the 13 patients with available information, 3 (23%) were hospitalized, and no deaths were reported.

Progression of the Outbreak Investigation ↑ (#onpage)

October 11, 2012

Final Case Count Update

A total of 127 persons infected with the outbreak strain of *Salmonella* Braenderup were reported from 15 states. Since the last update, six new cases were reported from California.

Among persons for whom information was available, illness onset dates ranged from July 3, 2012 to September 1, 2012. Ill persons ranged in age from less than 1 year to 86 years, with a median age of 33 years. Fifty-six percent of ill persons were female. Among 101 persons with available information, 33 (33%) patients reported being hospitalized. No deaths were reported.

September 14, 2012

Case Count Update

A total of 121 persons infected with the outbreak strain of *Salmonella* Braenderup have been reported from 15 states. The 17 new cases are from 4 states: California (13), Hawaii (1), Illinois (1), and Washington (2).

Among persons for whom information is available, illness onset dates range from July 3, 2012 to August 27, 2012. Ill persons range in age from less than 1 year to 86 years, with a median age of 30 years. Fifty-four percent of ill persons are female. Among 73 persons with available information, 25 (34%) patients reported being hospitalized. No deaths have been reported.

Illnesses that occurred after August 20, 2012, might not be reported yet due to the time it takes between when a person becomes ill and when the illness is reported.

Recall Update

On September 13, 2012, the FDA warned consumers against eating mangoes from Agricola Daniella (<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm319464.htm>) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>), a mango supplier with multiple plantations and a single packing house located in Sinaloa, Mexico. Testing by the FDA has found *Salmonella* in mangoes from this producer.

FDA has placed Agricola Daniella on Import Alert

(http://www.accessdata.fda.gov/cms_ia/importalert_266.html) [↗](#)

(<http://www.cdc.gov/Other/disclaimer.html>). This means that Agricola Daniella mangoes will be denied admission into the United States unless the importer shows they are not contaminated with *Salmonella*, such as by using private laboratories to test the mangoes.

August 30, 2012

Case Count Update

A total of 105 persons infected with the outbreak strain of *Salmonella* Braenderup have been reported from 16 states. The number of ill people identified in each state is as follows: California (80), Delaware (1), Hawaii (3), Idaho (1), Illinois (1), Louisiana (1), Maine (1), Michigan (1), Montana (1), Nebraska (1), New Jersey (1), New York (3), Oregon (1), Texas (2), Washington (6), and Wisconsin (1).

Among persons for whom information is available, illness onset dates range from July 3, 2012 to August 11, 2012. Ill persons range in age from less than 1 year to 86 years, with a median age of 30 years old. Fifty-four percent of ill persons are female. Among 69 persons with available information, 25 (36%) patients reported being hospitalized. No deaths have been reported.

Illnesses that occurred after August 6, 2012, might not be reported yet due to the time it takes between when a person becomes ill and when the illness is reported.

Recall

On August 29, 2012, Splendid Products of Burlingame, California, voluntarily recalled certain lots of Daniella brand mangoes (<http://www.splendidmangos.com/>) [↗](#) (<http://www.cdc.gov/Other/disclaimer.html>), a product of Mexico, because they were one

possible source contributing to the multistate outbreak of *Salmonella* Braenderup infections.

The recalled mangoes can be identified by the Daniella brand sticker and one of the following PLU numbers: 3114, 4051, 4311, 4584 or 4959. The mangoes were sold at various retail stores throughout the United States between July 12, 2012 and August 29, 2012.

Initial Announcement

August 29, 2012

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* Braenderup infections. Joint investigation efforts indicate that mangoes are a likely source of this outbreak.

Public health investigators are using DNA “fingerprints” of *Salmonella* bacteria obtained through diagnostic testing with pulsed-field gel electrophoresis, or PFGE, to identify cases of illness that may be part of this outbreak. They are using data from PulseNet ([/pulsenet/](http://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.

A total of 103 persons infected with the outbreak strain of *Salmonella* Braenderup have been reported from 16 states. The majority of ill persons (78) have been reported from California. This number may change as more cases are confirmed. Most persons became ill during July. Among persons for whom information is available, illness onset dates range from July 3, 2012 to August 11, 2012. Ill persons range in age from 1 to 86 years, with a median age of 32 years old. Fifty-five percent of ill persons are female. Among 69 persons with available information, 25 (36%) patients reported being hospitalized. No deaths have been reported.

This PFGE pattern has been seen before in PulseNet, and in the past typically caused 2 to 3 cases per month. Therefore, some reported cases may not be part of this outbreak. Illnesses that occurred after August 5, 2012, might not be reported yet due to the time it takes between when a person becomes ill and when the illness is reported.

Investigation of the Outbreak

State public health officials are interviewing ill persons to obtain information regarding foods they might have eaten and other exposures in the week before illness. Preliminary information indicates that mangoes are a likely source for the *Salmonella* Braenderup infections. Approximately 70% of ill persons interviewed report consuming mangoes in the week before becoming ill. Among ill persons in California, approximately 80% are of Hispanic ethnicity. Many of the ill persons in California report purchasing mangoes from Hispanic markets or grocery stores. Investigations are ongoing to determine the specific type and source of mangoes that might be linked with illness.

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. FDA is continuing to work closely with CDC and state partners during this investigation. CDC will update the public on the progress of this investigation as information becomes available.

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