

Outbreak of *Listeria* Infections Linked to Enoki Mushrooms

Final Update

Posted June 9, 2020 at 11:00 AM ET

This outbreak appears to be over. However, *Listeria* remains an important cause of serious, life-threatening illness in the United States. For steps that you can take to reduce your risk of infection, visit CDC's [Preventing Listeriosis webpage](#).

CDC, public health and regulatory officials in several states, and the US Food and Drug Administration investigated a multistate outbreak of *Listeria monocytogenes* infections linked to enoki mushrooms.

Advice to Consumers and Retailers

At A Glance

- [Reported Cases](#): 36
- [States](#): 17
- Hospitalizations: 31
- Deaths: 4
- Recall: Yes

Recalled enoki mushrooms from H&C Food Inc., Guan's Mushroom Co., and sun Hong Foods, Inc. are past their shelf life and should not be available for sale.

- **Wash and sanitize** any surfaces and containers that may have come in contact with the recalled enoki mushrooms. *Listeria* can survive in refrigerated temperatures and can easily spread to other foods and surfaces.
 - Follow these [five steps to clean your refrigerator](#).
 - Wash surfaces with hot, soapy water.
 - Wash containers with hot, soapy water or in the dishwasher.
 - To sanitize surfaces and containers, use a solution of 1 tablespoon of liquid bleach in 1 gallon of water. Do this after cleaning with hot, soapy water.
 - FDA recommends that food processors, restaurants, and retailers who received recalled enoki mushrooms, use extra vigilance in cleaning and sanitizing any surfaces and containers that may have come in contact with these products, to reduce the risk of cross-contamination.
- **Protect yourself** and your customers from *Listeria*
 - Learn [which groups of people](#) are most likely to get a serious *Listeria*

- Learn which foods are more likely to contain *Listeria* and how you can take steps to [prevent *Listeria*](#).
- Contact a healthcare provider if you have eaten a recalled product and are experiencing [symptoms of listeriosis](#).

Final Outbreak Information

- As of June 9, 2020, this outbreak appears to be over.
- [Epidemiologic, traceback, and laboratory evidence](#) showed that enoki mushrooms supplied by Green Co. LTD, located in the Republic of Korea, were the likely source of this outbreak.
- Thirty-six people infected with the outbreak strain of *Listeria monocytogenes* were reported from 17 states.
 - Thirty-one hospitalizations were reported. Four deaths were reported from California (2), Hawaii, and New Jersey.
 - Six pregnancy-associated cases were reported, with two resulting in fetal loss.

Symptoms of *Listeria* Infection

- Listeriosis can cause different symptoms, depending on the person.
 - **Pregnant women** typically experience only fever and other flu-like symptoms, such as fatigue and muscle aches. However, infections during pregnancy can lead to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.
 - **People other than pregnant women:** Symptoms can include headache, stiff neck, confusion, loss of balance, and convulsions in addition to fever and muscle aches.
- Symptoms for invasive listeriosis usually start 1 to 4 weeks after eating food contaminated with *Listeria*. Some people have reported symptoms starting as late as 70 days after exposure or as early as on the same day of exposure.

Investigation Details

June 9, 2020

CDC, public health and regulatory officials in several states, and the U.S. Food and Drug Administration (FDA) investigated a multistate outbreak of *Listeria monocytogenes* infections linked to enoki mushrooms.

Public health investigators used the [PulseNet](#) system to identify illnesses that were part of this outbreak. PulseNet is the national subtyping network of public health and food regulatory agency laboratories coordinated by CDC. DNA fingerprinting is performed on *Listeria* bacteria isolated from ill people by using a standardized laboratory and data analysis method called [whole genome sequencing](#) (WGS). CDC

PulseNet manages a national database of these sequences that are used to identify possible outbreaks. WGS gives investigators detailed information about the bacteria causing illness. In this investigation, WGS showed that bacteria isolated from ill people were closely related genetically. This means that people in this outbreak were likely to share a common source of infection.

A total of 36 people infected with the outbreak strain of *Listeria monocytogenes* were reported from 17 states. A list of the states and the number of cases in each can be found on the [Map of Reported Cases page](#).

Listeria specimens from ill people were collected from [November 23, 2016, to December 13, 2019](#). Ill people ranged in age from less than 1 to 96 years, with a median age of 67. Fifty-eight percent of ill people were female. Of 33 ill people with information available, 31 hospitalizations were reported. Four deaths were reported from California (2), Hawaii, and New Jersey. Six cases were pregnancy-associated, with two resulting in fetal loss.

Investigation of the Outbreak

[Epidemiologic, traceback, and laboratory evidence](#) showed that enoki mushrooms supplied by Green Co. LTD, located in the Republic of Korea, were the likely source of this outbreak.

In interviews, ill people answered [questions about the foods they ate and other exposures](#) in the month before they became ill. Twelve out of 22 (55%) reported eating mushrooms, including enoki, portobello, white, button, cremini, wood ear, maitake, and oyster.

FDA and state officials collected enoki mushrooms for testing. The Michigan Department of Agriculture and Rural Development collected enoki mushrooms from a grocery store where an ill person shopped and identified the outbreak strain in two samples. These mushrooms were labeled as “Product of Korea” and were distributed by Sun Hong Foods, Inc. On March 9, 2020, Sun Hong foods, Inc. enoki mushrooms. The California Department of Public Health collected enoki mushrooms from grocery stores and identified the outbreak strain in one sample. These mushrooms were labeled as “Product of Korea” and were distributed by Guan’s Mushroom Co. On March 23, 2020, Guan’s Mushroom Co. enoki mushrooms. FDA collected samples of enoki mushrooms for testing at import from Green Co. LTD of the Republic of Korea. On April 6, 2020, results showed that two samples yielded the outbreak strain of *Listeria monocytogenes*. As a result, on April 7, 2020, FDA placed Green Co. LTD on Import Alert and H&C Foods Inc. recalled enoki mushrooms supplied by Green Co. LTD.

On March 18, 2020, the Korean Ministry of Food and Drug Safety published its investigation findings and steps it will take to prevent future illnesses. It found *Listeria monocytogenes* in enoki mushrooms produced by two firms in the Republic of Korea.

Recalled enoki mushrooms are past their shelf life and should not be available for sale. As of June 9, 2020, this outbreak appears to be over.