Food Safety and Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

FSIS Foodborne Illness Outbreak Investigations, Fiscal Year 2023

Introduction

The U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS), Office of Public Health Science, Applied Epidemiology Staff, coordinates the FSIS response to foodborne illness outbreaks that may involve FSIS-regulated products. This includes outbreaks that involve four foodborne pathogens that most frequently contaminate FSIS-regulated products: *Salmonella*, Shiga toxin-producing *Escherichia coli* (STEC), *Listeria monocytogenes*, and *Campylobacter*. A foodborne outbreak occurs when two or more persons experience a similar illness after ingestion of a common food, and epidemiologic analysis implicates the food as the source of the illness. FSIS may investigate illnesses associated with other, less common, foodborne pathogens (e.g., *Clostridium botulinum*) if they are potentially associated with FSIS-regulated products.

FSIS collects and evaluates epidemiologic, laboratory, and traceback information to determine if there is an association between an FSIS-regulated product and human illnesses. Epidemiologic information can include details like which foods ill people ate, where they purchased these foods, and where they live. Laboratory information can include comparing bacteria from FSIS samples and ill people to see if they are genetically similar or have similar characteristics. Traceback activities may include determining the location where the product was sold (e.g., grocery store, deli counter, or restaurant) or the source of a product (e.g., the federally inspected slaughter or processing facility). Depending on the evidence collected during an investigation, FSIS may have enough detailed exposure and product information to take one or more actions to prevent additional illnesses. These actions may include requesting that a company remove product from commerce and FSIS issuing a press release announcing that a firm is recalling meat, poultry, or egg products linked to human illnesses or FSIS notifying the public of potential food safety concerns through the issuance of a Public Health Alert (PHA).

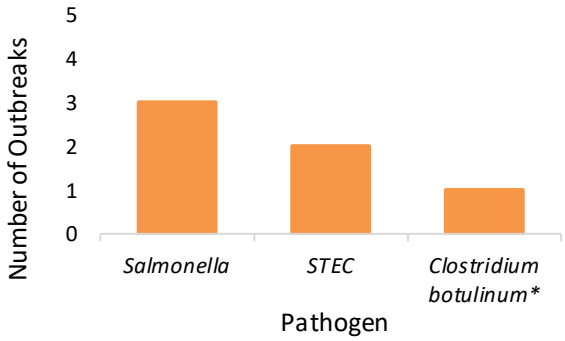
This report summarizes outbreaks that FSIS investigated from October 1, 2022, to September 30, 2023, Fiscal Year 2023 (FY 2023). This report also highlights key lessons learned from outbreak investigations in FY 2023.

Fiscal Year 2023 in Review

During FY 2023, FSIS investigated six outbreaks in coordination with local, state, and federal public health partners. These outbreaks involved more than 100 illnesses and 30 hospitalizations. The Centers for Disease Control and Prevention notified FSIS of five (83%) of these outbreaks. FSIS became aware of the sixth outbreak by notification from a state public health agency. Five (83%) outbreaks involved illnesses in more than one state.

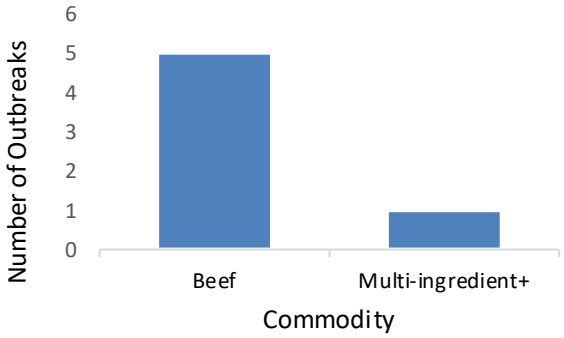
Of the six outbreaks investigated by FSIS in FY 2023, three were caused by *Salmonella* (serotypes Newport, Saintpaul, and Typhimurium) and two by STEC (serogroup O157:H7). The sixth investigation involved a report of botulism that included commercially canned potted meat (containing chicken and pork) as a potential source (Figure 1). Given botulinum toxin's potential to cause severe illness, FSIS investigates reports of one or more botulism cases that may be associated with FSIS-regulated products and includes those investigations in the Agency's annual outbreak report. Beef products were the food product of interest for the five *Salmonella* and STEC outbreaks investigated in FY 2023 (Figure 2).

Figure 1. FY 2023 Outbreaks by Pathogen (N = 6)



** FSIS investigated a case of suspected foodborne botulism that was later determined to not be caused by a food source*

Figure 2. FY 2023 Outbreaks by Product of Interest (N = 6)



+ Product investigated was canned potted meat (containing chicken and pork)

In FY 2023, outbreak investigations did not lead to any recalls of FSIS-regulated products or PHAs. FSIS may ask an establishment to voluntarily recall product from commerce to protect public health when the product is found to be associated with an outbreak. A recall is a firm's removal of distributed meat, poultry, or egg products from commerce when there is a reason to believe that such products are adulterated or misbranded under the provisions of the Federal Meat Inspection Act, the Poultry Products Inspection Act, or Egg Products Inspection Act. FSIS may issue a PHA when the Agency determines that a meat, poultry, or egg product may be associated with human illness, but no adulterated product remains in commerce. FSIS may also issue a PHA when the Agency is unable to determine what specific regulated product is implicated by the illnesses and thus adulterated.

Table 1 depicts characteristics of outbreaks investigated in FY 2023, including information on the serotype/serogroup, product of interest, and whether FSIS or non-FSIS samples were genetically related to human illnesses. While investigating outbreaks is crucial to protect public health, it is important to note that outbreak-associated illnesses represent a very small proportion of all foodborne illnesses. Consumers who are sick with a foodborne illness may not seek medical care or be tested for foodborne pathogens. Those that are tested may not be linked to other similar illnesses to initiate an outbreak investigation.

Table 1. FY 2023 Outbreak Characteristics

Pathogen	Serotype/ Serogroup	Commodity[A]	FSIS Isolates[B]	Non-FSIS Isolates[C]	Recall[D]	PHA[E]
Salmonella	Newport	Beef	No	Yes	No	No
	Saintpaul	Beef	Yes	No	No	No
	Typhimurium	Beef	Yes	Yes	No	No
STEC	O157:H7	Beef	No	No	No	No
	O157:H7	Beef	No	No	No	No
Clostridium botulinum[+]		Multi-ingredient[++]	No	No	No	No

A) Product investigated by FSIS as possible, likely, or confirmed cause of illnesses during investigation.
B) Isolates recovered from FSIS testing (product, cecal, or environmental) found to be related by whole genome sequencing or another testing method to outbreak clinical isolates.
C) Isolates recovered from non-FSIS testing (product, live animal, or environmental) found to be related by whole genome sequencing to outbreak clinical isolates.
D) Based on available evidence, FSIS-regulated product was determined to be the cause of human illnesses and an FSIS-regulated establishment recalled product from commerce.
E) Based on available evidence, FSIS-regulated product poses a public health risk; however, the product is no longer available for sale in commerce or FSIS is unable to determine which specific product is adulterated or misbranded and FSIS issued a PHA to notify the public.
+) Investigation of a case of suspected foodborne botulism; illness was later determined to not be associated with a food source.
++) The product investigated was canned potted meat (containing chicken and pork).

Learning from Outbreaks

Analysis of outbreaks associated with FSIS-regulated products is crucial to FSIS' mission to prevent foodborne illness and to protect public health. FSIS conducts after action reviews (AAR) at the conclusion of foodborne outbreak investigations to identify lessons learned that can help improve response and prevent future illnesses. Applying and sharing outbreak lessons learned may lead to improved food safety policies and can strengthen collaborative investigations with public health partners. Below are highlights from AARs conducted during FY 2023.

In FY 2023, FSIS investigated several outbreaks potentially associated with ground beef, including beef ground and packaged at retail stores. Ground beef produced in retail stores can

complicate investigations if retail records do not clearly identify the specific suppliers of beef that were ground and later purchased by ill people. Retailers that grind are required to keep records for all ground beef produced in-store. These records are crucial for investigators to identify potentially contaminated product(s) that may be linked to an outbreak and for FSIS to take action to prevent additional illnesses.

FSIS investigated a *Clostridium botulinum* illness potentially associated with canned potted meat (containing chicken and pork). FSIS' investigation of the establishment where the canned potted meat was produced, and laboratory testing of similar cans, did not determine that the canned potted meat was the source of the illness. The illness was later determined to not be associated with a food source. This investigation highlights the importance of a quick response and good collaboration between state and federal public health partners involving an uncommon bacterium (*C. botulinum*). Continuing to foster relationships with public health partners will enable FSIS to continue to quickly respond to potential outbreaks in the future.

To learn more about outbreaks and see examples of how FSIS has applied outbreak lessons learned toward illness prevention, visit the FSIS Outbreaks webpage.