



# FSIS Foodborne Illness Outbreak Investigations, Fiscal Year 2020

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## Introduction

The United States 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 affect FSIS-regulated products: *Salmonella*, Shiga toxin-producing *Escherichia coli* (STEC), *Listeria monocytogenes* (Lm), and *Campylobacter*.

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 includes details like the foods ill people ate, where they purchased these foods, and where they live. Laboratory information includes 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 issuing a press release announcing that a Federal establishment is voluntarily recalling product(s) linked to human illnesses or notifying the public of potential food safety concerns through the issuance of a public health alert.

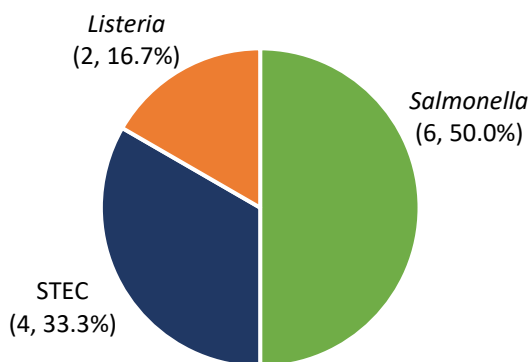
This report summarizes outbreaks that FSIS investigated from October 1, 2019 to September 30, 2020, Fiscal Year 2020 (FY 2020). While the number of outbreaks FSIS investigates annually does fluctuate, it is important to acknowledge how changes to daily life due to the COVID-19 pandemic likely affected the number of reported foodborne illness outbreaks in FY 2020. [According to the Centers for Disease Control and Prevention \(CDC\)](#), in calendar year 2020 there was a 26% decrease in reported infections of the most common foodborne pathogens monitored by FoodNet compared to the previous three years. Several factors likely played a part, including healthcare-seeking behaviors, hygiene practices, and where consumers ate their meals.

## Fiscal Year 2020 in Review

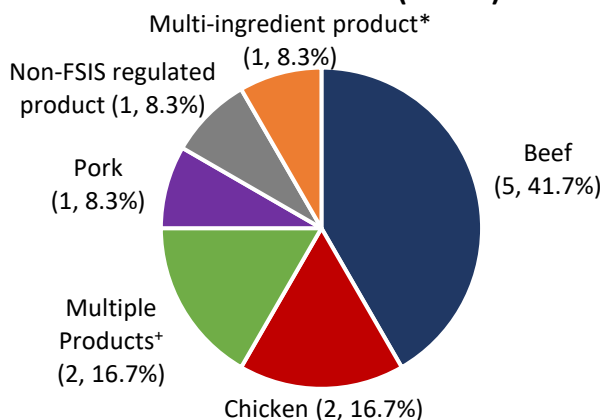
During FY 2020, FSIS investigated 12 outbreaks in coordination with local, State, and Federal public health partners. These outbreaks involved approximately 400 illnesses and more than 150 hospitalizations. State public health partners (6, 50.0%) and the CDC (4, 33.3%) notified FSIS about the majority of these outbreaks. Eleven (91.7%) outbreaks involved illnesses in more than one state.

Of the 12 outbreaks investigated by FSIS in FY 2020, *Salmonella* (6, 50.0%) was the most common pathogen followed by STEC (4, 33.3%) and *Lm* (2, 16.7%) (Figure 1). Beef (5, 41.7%) was the most common food product of interest (Figure 2). The six *Salmonella* outbreaks investigated in FY 2020 involved five serotypes: Dublin; Enteritidis; I 4,[5],12:i:-; Thompson; and Typhimurium. All four STEC outbreaks investigated in FY 2020 were caused by serogroup O157:H7.

**Figure 1. FY 2020 Outbreaks by Pathogen (N = 12)**



**Figure 2. FY 2020 Outbreaks by Product of Interest (N = 12)**



\* Product investigated included multiple ingredients

+ Multiple FSIS-regulated products were investigated, and a single suspect food was not identified

Two (16.7%) outbreaks led to a recall of FSIS-regulated products in FY 2020. FSIS requests that establishments recall remaining product from commerce when it is found to be associated with an outbreak, there is enough information to identify the product, and the product is still in commerce. One additional outbreak led to a recall initiated by a retail store after a State public health partner notified them that product further processed and packaged by the retail store was associated with an outbreak. Table 1 depicts characteristics about these outbreaks investigated in FY 2020, including information on the serotype/serogroup, product of interest, if FSIS or non-FSIS samples were determined to be genetically related to human illnesses, and if the available outbreak information resulted in a recall of FSIS-regulated products from commerce to prevent additional illnesses.

**Table 1. FY 2020 Outbreak Characteristics**

Pathogen	Serotype/Serogroup	Product <sup>A</sup>	FSIS Isolates <sup>D</sup>	Non-FSIS Isolates <sup>E</sup>	Recall <sup>F</sup>
STEC	O157:H7	Beef	No	Yes	No <sup>G</sup>
	O157:H7	Non-FSIS Regulated Product (Romaine)	No	Yes	Yes <sup>H</sup>
	O157:H7	Multi-ingredient <sup>B</sup>	No	No	No
	O157:H7	Beef	No	No	No
<i>Lm</i>		Multiple Products <sup>C</sup>	Yes	No	No
		Multiple Products <sup>C</sup>	No	No	No
<i>Salmonella</i>	Dublin	Beef	Yes	Yes	Yes
	Enteritidis	Chicken	Yes	No	No
	I 4,[5],12:i:-	Pork	No	No	No
	Thompson	Chicken	No	Yes	No
	Typhimurium	Beef	Yes	No	No
	Typhimurium	Beef	Yes	No	No

- A) Product investigated by FSIS as possible, likely, or confirmed cause of illnesses during investigation
- B) Product(s) investigated included multiple ingredients
- C) Multiple FSIS-regulated products were investigated, and a single suspect food was not identified
- D) Isolates recovered from FSIS testing (product, cecal, or environmental) found to be related by whole genome sequencing to clinical isolates and are included in the outbreak cluster
- E) Isolates recovered from non-FSIS testing (product, live animal, or environmental) found to be related by whole genome sequencing to clinical isolates and are included in the outbreak cluster
- F) Based on available evidence, FSIS-regulated product was determined to be the cause of human illnesses and an FSIS-regulated establishment voluntarily recalled product from commerce
- G) Recall of product processed and packaged by a retail store; retail records did not allow FSIS to definitively determine the FSIS-regulated supplying establishment
- H) Recall of FSIS-regulated salad containing chicken; romaine lettuce was later determined to be the outbreak source

## Learning from Outbreaks

Assessment of outbreaks associated with FSIS-regulated products is crucial to FSIS' mission to prevent foodborne illness and to protect public health. FSIS routinely 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. FSIS has conducted AARs for several FY 2020 outbreak investigations to identify best practices and areas for improvement.

FSIS conducted an AAR in collaboration with public health partners for a [Salmonella Dublin outbreak](#) associated with ground beef.

- As part of the investigation, investigators used an Electronic Benefit Transfer (EBT) card to identify specific products purchased by the case.
- Using the EBT card records along with retail grinding records, investigators were able to

identify the FSIS-regulated supplier of ground beef purchased by the case.

- In situations where documents traditionally used for traceback, such as receipts or shopper card records, are not available, other forms of purchase documentation may be available to identify products purchased and conduct traceback.

The AAR conducted for an FY 2020 outbreak of [E. coli O157:H7](#) associated with ground beef identified the “intended use” of beef as an important issue.

- During this outbreak, investigators noted that retailers used whole cuts of beef that had been produced by the inspected establishment as intended for intact use, and not intended to be ground, to produce raw ground beef.
- There are minimal safety concerns with intact cuts (e.g., steaks that are not mechanically tenderized) externally contaminated with *E. coli* O157:H7 as normal consumer cooking to a rare or medium internal state will eliminate pathogens on the exterior.
- Ground beef and mechanically tenderized steaks, however, are higher-risk products because pathogens may move throughout the product and consumer cooking to a rare or medium internal state will not eliminate all *E. coli* O157:H7.
- Because of this difference, FSIS generally requires that establishments employ more rigorous controls to beef that is intended to be ground (or otherwise non-intact), when compared to intact beef.

To see additional FSIS AAR reports and examples of how FSIS has applied outbreak lessons learned toward illness prevention, visit [Foodborne Outbreak Investigation Outcomes - Response and Prevention](#).

## Contact and Questions

For more information, contact [askFSIS](#).