FSIS Foodborne Illness Outbreak Investigations, Fiscal Year 2018

Introduction

The United States Department of Agriculture's Food Safety and Inspection Service, 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 in FSIS samples and ill people to see if they are genetically similar or have similar characteristics. Traceback activities may include determining the location (e.g., grocery store, deli counter, or restaurant) where the product was sold 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 during October 1, 2017 through September 30, 2018, Fiscal Year 2018 (FY 2018).

Fiscal Year 2018 in Review

During FY 2018, FSIS investigated 16 outbreaks in coordination with local, state, and federal public health partners that involved approximately 1,400 illnesses and more than 400 hospitalizations. State public health partners notified FSIS most often (9, 56.3%). Ten (62.5%) outbreaks involved illnesses in more than one state.

Of the 16 outbreaks investigated by FSIS in FY 2018, *Salmonella* (9, 56.3%) was the most common pathogen, followed by STEC (5, 31.3%), *Clostridium* and *Salmonella* (1, 6.3%), and *Lm* (1, 6.3%) (Figure 1). Beef (6, 37.5%) and chicken (5, 31.3%) were the most common food products of interest (Figure 2). Serotypes involved in the FY 2018 *Salmonella* outbreaks included Newport, I 4,[5],12:i:-, Reading, Typhimurium, Infantis, Blockley, and Enteritidis. STEC outbreaks were caused by one or more of the following serogroups: O157:H7 and O26.

Six (37.5%) outbreaks led to a product recall. FSIS requested that establishments recall product associated with outbreaks.

Table 1 depicts characteristics about these outbreaks, including information on the serotype/serogroup, product of interest, if FSIS samples were determined to be related to human illnesses, and if the available outbreak information resulted in a recall of FSIS-regulated products from commerce to prevent additional illnesses.

Figure 1. FY 2018 Outbreaks by Pathogen, N = 16 (%)

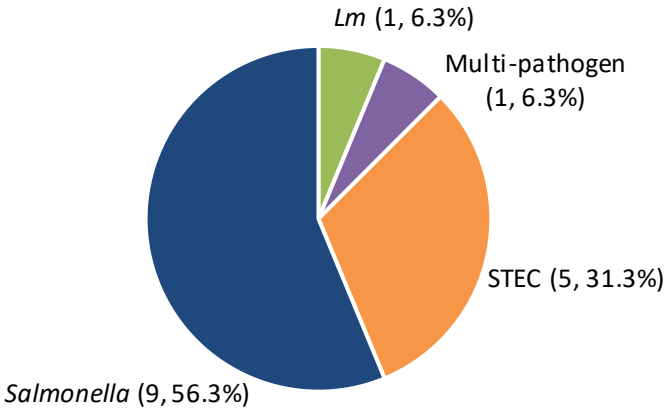
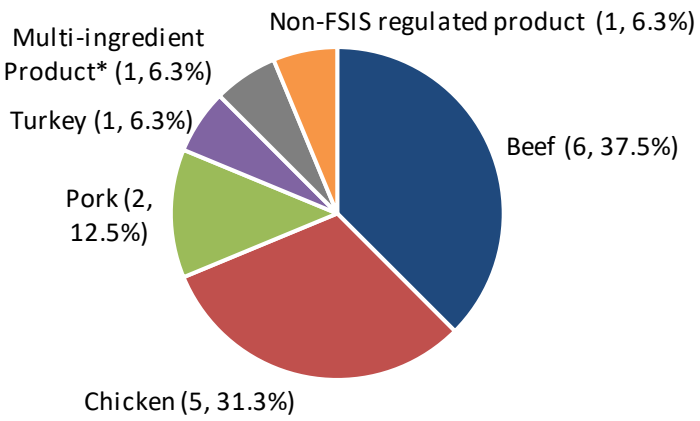


Figure 2. FY 2018 Outbreaks by Product of Interest, N = 16 (%)



*Product investigated included multiple ingredients

Table 1. FY 2018 Outbreak Characteristics

Pathogen	Serotype/Serogroup	Product[B]	FSIS isolates[D]	Non FSIS isolates[E]	Recall[F]
STEC	O157:H7	Beef	No	No	Yes
	O157:H7	Beef	No	Yes	No
	O157:H7	Non-FSIS Regulated Product (Romaine)	No	Yes	No
	O26	Beef	Yes	Yes	Yes
	O157:H7 and O26	Beef	No	No	No
Lm		Pork	Yes	No	Yes
Salmonella	Blockley	Chicken	Yes	Yes	No
	Enteritidis	Chicken	No	Yes	No
	Infantis	Chicken	Yes	Yes	No
	Newport	Beef	Yes	Yes	No
	Newport	Beef	Yes	Yes	Yes
	Reading	Turkey	Yes	Yes	Yes
	Typhimurium	Chicken	No	Yes	Yes
	I 4,[5],12:i:-	Pork	No	No	No
	I 4,[5],12:i:-	Chicken	Yes	No	No
Multi-pathogen[A]		Multi-ingredient Product[C]	No	Yes	No

A) *Clostridium perfringens* and *Salmonella* I 4,[5],12:i:-
B) Product investigated by FSIS as possible, likely, or confirmed cause of illnesses during outbreak investigation
C) Product(s) investigated included multiple ingredients
D) Isolates recovered from FSIS product (or cecal) or environmental testing found to be related (either by whole genome sequencing or pulsed-field gel electrophoresis) to clinical isolates and are included in the outbreak cluster

E) Isolates recovered from non-FSIS product, live animal, or environmental testing found to be related (either by whole genome sequencing or pulsed-field gel electrophoresis) 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 a company voluntarily recalled product from commerce

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 (AARs) 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 conducted AARs for several FY 2018 outbreak investigations. For example, FSIS, conducted an AAR in collaboration with public health partners for an FY 2018 *Salmonella* Typhimurium illness outbreak associated with chicken salad. Similar to other outbreaks, this AAR identified the need to improve communication between investigation partners. To facilitate such communication, FSIS published a "Template for Including FSIS in Foodborne Illness Response Procedures" on its webpage. The AAR report for this outbreak investigation is posted on the FSIS website.

To see additional posted 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*.