Salmonella Dublin Illness Outbreak Associated with Ground Beef, 2019

After-Action Review Report 2020-01

September 3, 2020

Overview

During September–December 2019, public health officials in several states, the Centers for Disease Control and Prevention (CDC), the Agricultural Marketing Service (AMS), and the Food Safety and Inspection Service (FSIS) investigated an outbreak of 13 *Salmonella* Dublin illnesses linked to ground beef sold at multiple retail stores. Nine ill people were reported to have been hospitalized, and one death was reported from California. Ground beef produced at an FSIS-regulated establishment was collected from an ill person's home and subsequently tested positive for the outbreak strain of *S*. Dublin. The source establishment was determined using a purchasing history collected from an ill person's Electronic Benefit Transfer (EBT) card and from retail grinding records. This investigation led to a voluntary recall of ground beef products; however, the recalled products likely did not account for all of the reported illnesses in the outbreak.

FSIS received an early notification of this outbreak through an automated alert from the National Center for Biotechnology Information (NCBI). *Salmonella* Dublin is more likely to cause severe illness than other *Salmonella* serotypes, as illustrated in this outbreak by the reported death and the relatively high hospitalization rate. FSIS promotes studies under its food safety research priorities to gain a better understanding of pathogen factors associated with disease severity.

Epidemiology

- On September 10, 2019, FSIS received an automated alert from NCBI's Pathogen Detection Browser of a cluster of *S*. Dublin infections in seven people whose clinical bacterial isolates were genetically close to three isolates recovered from routinely collected FSIS beef samples. Whole genome sequencing (WGS) was used to assess the relatedness of the bacterial isolates and identify the outbreak strain.
- Additional ill people with the outbreak strain were identified for a total of 13 cases (see Table 1 for epidemiologic details).
- Among nine ill people with exposure information:
    - Eight (89%) reported consuming ground beef in the week prior to illness.
    - One (11%) reported consuming ground beef purchased from Retailer A, and five (56%) reported purchasing ground beef from Retailer B.

Table 1. Characteristics of ill people—*Salmonella* Dublin illness outbreak associated with ground beef, 2019

Total number of ill people and states of residence	13 ill people from 8 states (see CDC case count map)
Illness onset date range	August 8–October 22, 2019 (see CDC epi curve)
Age range (median) in years	39–74 (66)
Percent female	38
Number (%) of reported hospitalizations	9 (82%) of 11 ill people with available information
Number of reported deaths	1 (California resident)

Product Sampling

Routine FSIS sampling

- The outbreak strain of *S*. Dublin was identified in six beef samples collected by USDA (four by FSIS and two by AMS) during July–September 2019, including two samples of beef produced by Establishment C.

California

- California officials collected and analyzed frozen, non-intact (opened package) ground beef from an ill person's home. The outbreak strain of *S*. Dublin was identified in the sample of ground beef.
    - Per its Policy on Use of Results from Non-FSIS Laboratories, FSIS assessed and accepted these results.
- To determine the source of this ground beef, officials in California and FSIS conducted a traceback investigation using the purchase history received through the ill person's EBT card. The purchase history indicated the ill person had purchased the ground beef from Retailer A. Grinding records maintained by Retailer A indicated that the ground beef purchased by the ill person was produced at Retailer A using beef sourced from Establishment C.

Kansas

- Government and industry partners also pursued traceback efforts that did not yield a common source, including an investigation conducted by officials in Kansas and FSIS. In this instance, Retailer B established a phone line for ill consumers to call to determine their purchase history using their credit or debit card information. One ill person's purchase history was retrieved through this phone line; however, the information obtained was not sufficient to definitively trace the ground beef purchased to a specific production date.

Industry, Public Health, and Regulatory Actions

- CDC published an Investigation Notice about this outbreak on November 1, 2019 (updated as a Food Safety Alert November 19, 2019; final update December 30, 2019).
- Based on the evidence obtained through the ill person's EBT card and retail grinding records from Retailer A, on November 15, 2019, Establishment C voluntarily recalled approximately 34,222 pounds of ground beef produced on July 23, 2019. However, given the geographic distribution of the ill people, beef distributed by Establishment C likely did not account for all the reported illnesses in this outbreak.

Lessons Learned and Related Policy Actions

Traceback Investigation

EBT Card

- The purchase history received through an ill person's EBT card and retail grinding records led to the identification of the source of ground beef from the ill person's home that was positive for the outbreak strain. This may have been the first use of an EBT card to obtain purchase history during a foodborne outbreak investigation. This and other novel traceback methods should be explored and utilized in future outbreak investigations.

Retailer Phone Line

- Although the purchase history obtained through the retailer phone line mentioned above did not allow investigators to identify a specific source production date, such efforts by retailers can still be useful for traceback investigations. Retailers should consider routine use of similar methods to collaborate with public health partners toward shared goals to protect consumers and solve outbreaks, particularly when purchase records are not available via receipts or shopper/loyalty cards.

Outbreak Detection

- FSIS received an automated alert from NCBI regarding clinical bacterial isolates genetically close by WGS to FSIS product isolates, which served as an early notification of the outbreak. Such outbreak notifications can facilitate prompt investigation and response actions.

Pathogen Severity

- This outbreak included nine hospitalizations and one reported death, underscoring the severity of illness associated with *S*. Dublin, which is more likely to cause severe illness than other *Salmonella* serotypes. To inform its risk management strategies, FSIS promotes studies on factors that may influence a pathogen's ability to cause severe disease through its food safety research priorities.

References/Helpful Links

- FSIS Food Safety Research Priorities
- Establishment C Recall 113-2019 of ground beef, November 15, 2019
- CDC Investigation Notice/Food Safety Alert, Outbreak of *Salmonella* Infections Linked to Ground Beef, December 30, 2019 (final update)
- FSIS Directive 10,000.1, Policy on Use of Results from Non-FSIS Laboratories

Last Modified Sep 03, 2020