

Foodborne Outbreaks

Foodborne Disease Outbreaks (FBDOs) occur frequently in California. The public agencies responsible and involved with FBDOs include:

At the local jurisdiction level:

1. Local health departments (LHDs): local public health workers and laboratories are the first line of response to FBDOs, identifying patients and possible exposures, and notifying the public as well as state and federal agencies.
2. Local environmental health (LEH) which may be part of the LHD or an independent local agency: LEH specialists inspect restaurants where FBDOs occurred.

At the state level:

1. The California Department of Health Services (CDHS) Division of Communicable Disease Control (DCDC): epidemiologists and laboratories assist LHDs with their investigation and responses to FBDOs, tracking human cases.
2. The CDHS Division of Food, Drug, and Radiation Safety (DFDRS): food safety staff investigate producers and distributors involved in FBDOs, including process reviews of food manufacturers, on farm investigations, tracebacks of implicated food products, and coordination of food recalls.
3. The California Department of Food and Agriculture (CDFA): promotes agricultural and food animal production, but also regulates food animals and milk and dairy products.

At the federal level:

1. The U.S. Centers for Disease Control and Prevention (CDC): epidemiologists and laboratories assist LHDs and states with investigations of FBDOs, tracking human cases, notifying the public, and coordinating with other federal agencies.
2. The U.S. Food and Drug Administration (FDA): regulates interstate food products including eggs, tracks food distribution, and initiates recalls if needed.
3. The U.S. Department of Agriculture (USDA): promotes agricultural and food animal production, but also initiates recalls of contaminated products.

Common issues impacting rapid control of FBDOs:

1. Some delay in detecting a FBDO always occurs since some time elapses before exposed individuals become ill, seek medical care (if they do at all), get diagnosed, and then are reported to public health authorities.
2. When a FBDO is recognized, the ensuing investigation by the LHD and local EH (sometimes assisted by state or federal resources) is resource intensive and time consuming and may or may not identify the source of the outbreak. Of FBDOs investigated, a source is identified only about half the time due to inherent delays (as above) and difficulties in doing an investigation, including lack of laboratory testing on all patients, and because food items often are no longer available.
3. Regulators and communicable disease officials prefer to have laboratory evidence in FBDO investigations. However, this is not always possible. A food item implicated from the epidemiologic investigation has often already been consumed or discarded and there is none left for testing, in which case there is no ability to identify the causative agent using laboratory methods.
4. Even if there is leftover food for testing, laboratory tests are not always sensitive enough to detect the causative agent in the food.
5. State and federal food safety regulators review the available evidence, epidemiologic and/or laboratory, and will work with the responsible producer to voluntarily recall their implicated product when appropriate. Recalls for all foods except infant formula are voluntary.
6. It is a priority for all public health and regulatory agencies to complete the investigation as quickly as possible so that further exposures to contaminated foods may be prevented.
7. Effective and timely communication and coordination among local, state, and federal agencies is critical.

***E.coli* Outbreak in Spinach, 2006: System Response to A Recent Threat to Public Health**

In the Fall 2006 *E.coli* O157:H7 outbreak associated with eating contaminated spinach, over 200 persons from 26 states were ill and 3 died. In this national outbreak, communication and coordination was required among various federal, state, and local agencies:

1. The initial and follow-up (case-control) epidemiologic studies were completed, and information from states on lot codes, brand names, etc. were submitted to the FDA, all of which required a fair amount of time.
2. On September 14, there was a conference call with federal CDC and FDA and several state health departments, including California, to announce and discuss a multi-state outbreak of *E.coli* O157. This outbreak was detected in some of the states which then posted the “molecular fingerprint” pattern of the outbreak strain on a national network known as PulseNet, thereby identifying other cases with the same pattern in other states. Only a couple of states had started an investigation into possible sources. Preliminary patient interviews suggested an association between illness and eating fresh bagged spinach. Given the facts at that time (increasing number of cases, severe outcomes, no specific brand or lot code), the FDA and some states issued a press release advising consumers not to eat any fresh bagged spinach. This prompt action likely prevented numerous additional exposures and illnesses.
3. State and federal investigators began the investigation on September 14. At FDA and California’s Department of Health Services’ urging, one of the major spinach distributors suspected in this outbreak “voluntarily” recalled their products containing spinach on September 15.
4. It took more than two weeks (it actually took much longer for states to begin and complete cultures of the remaining product and for everyone to agree that a single manufacturer and a single lot code were linked to this outbreak) for some public health laboratories to culture the outbreak strain from bagged spinach, for cultures to be completed from remaining product, and to identify the manufacturer and lot code linked to this outbreak.
5. Within two weeks, state and federal officials had narrowed the focus of the investigation to four farms in two counties. With an investigative team of over 25 staff, over 850 environmental samples were collected and analyzed by state and federal laboratories.
6. Laboratory results revealed the presence of the same strain of *E.coli* O157 from one of four suspect farms supplying spinach to the implicated processor during the time period of interest. Matching isolates from cattle feces, wild pig feces, and water/sediment from a stream on the one farm were identified. It is unclear how the spinach became contaminated.

Source: Duc J. Vugia, MD, MPH, Chief, Infectious Diseases Branch; Dr. Jeff Farrar, Chief, Food and Drug Branch; and Dr. Mark Starr, Acting Chief, Division of Communicable Disease Control. California Department of Health Services, 2006.