

**Outbreak of *Staphylococcus aureus* Associated with the Italian Garden Restaurant --
Lyon County, June 2009**



Background

On Friday, June 26, 2009, the Lyon County Health Department (LCHD) notified the Bureau of Surveillance and Epidemiology (BSE) at the Kansas Department of Health and Environment (KDHE) of a possible foodborne illness outbreak associated with Italian Garden Restaurant, 831 West 6th Ave, Emporia, KS. Several patrons developed an acute onset of nausea, vomiting, and diarrhea after eating at the restaurant on June 24 and June 25. KDHE and LCHD initiated an outbreak investigation to determine the cause of illness and to implement prevention and control measures.

Key Findings

- A case-control study was initiated, and a total of 283 individuals were interviewed. Twenty-one individuals reported illness. Of those, 17 met the case definition. A case is defined as an individual who experienced either vomiting and/or diarrhea within 12 hours of eating at the Italian Garden from June 12 - June 25.
- All 17 (100%) individuals experienced diarrhea, 15 (94%) reported abdominal cramps, 13 (76%) reported nausea, 11 (38%) reported vomiting, five (30%) experienced bloody diarrhea, and three (18%) sought medical care in the emergency department.
- Onset of illness ranged from June 13 to June 25, and ill individuals reported eating at the restaurant from June 12 to June 25.
- The incubation period ranged from 1 hour to 11 hours with a median of 4 hours. Date of recovery was reported by 11 cases, and duration of illness ranged from 1 day to 3 days with a median of 2 days. All but one individual had recovered by the time they were interviewed.
- For the case-control study, four controls were randomly selected and matched to each case by date of exposure to the restaurant.
- Ages of cases ranged from 8 – 81 years (median = 59 years), and ages of controls ranged from 1 – 80 years (median = 43.5 years).
- There were 51 females (12 cases and 39 controls) and 34 males (5 cases and 29 controls) interviewed for the case-control study.
- Several menu items were significantly associated with illness: the cannelloni (odds ratio [OR] = 34.31 ,95% confidence interval [CI] = 5.70 – 206.51), the pasta sampler, which contains lasagna, manicotti, and cannelloni ([OR] = 6.73 , 95% [CI] = 1.72 – 26.33), and any chicken entree ([OR] = 5.58, 95% [CI] = 1.44 – 21.68). The ingredients of the cannelloni included ground beef, spinach, mozzarella, ricotta, parmesan, and romano cheeses hand rolled in a sheet of pasta topped with marinara sauce.
- An inspection of the restaurant was conducted on June 26. Five critical violations were observed: 1) inadequate cold holding temperatures; 2) refrigeration units not holding proper cold hold temperatures; 3) improper cooling of cooked foods; 4) no date markings on any refrigerated foods; and 5) open drinks in the food preparation area. Four noncritical violations were observed: 1) improper thawing; 2) blocked hand washing sink; 3) no food thermometers; and 4) improper storing of in-use utensils. All food that was above proper temperature was destroyed, and all other violations were corrected at the time of the inspection.
- A sample of cannelloni was collected during the food inspection and tested positive for *S.aureus* enterotoxin. *S. aureus* was also isolated from the sample. Further analysis is pending at the Kansas Health and Environmental Laboratories (KHEL).
- An environmental investigation of the food distributor, Lisanti Food Service of Texas, is being conducted by the Texas Department of State Health Services to determine if contamination of the food occurred prior to delivery to the restaurant.
- Employee surveys were distributed to all employees to collect information regarding work history, food history, and illness information. None reported any gastrointestinal symptoms.

- Swabs from anterior nares were collected on all food handlers at the restaurant to test for *S. aureus* colonization; laboratory results are pending.

Preliminary Conclusions

This was an outbreak of *S. aureus* intoxication associated with the Italian Garden restaurant in Lyon County. Patrons who became ill dined at the establishment from June 12 – June 25. Two food items were significantly associated with illness: cannelloni and any entrée containing chicken. During the food inspection, a sample of the cannelloni was collected and subsequently tested positive for *S. aureus* enterotoxin. Additionally, *S. aureus* was cultured and isolated from the cannelloni and sent to Kansas Health and Environment Laboratories for additional testing. No sample of the chicken was collected or tested. During the inspection of the establishment multiple food items were above proper cold holding temperatures. The cheese filling for the cannelloni was at 54° and 57° F, raw chicken was at 79°F, and ready to eat chicken was at 54°F, which are all temperatures that *S. aureus* exhibits rapid growth and toxin production. Additional environmental investigations and laboratory testing are ongoing.

Intoxication by *S. aureus* is characterized by an abrupt onset of vomiting and/or diarrhea with symptoms occurring within an hour to eight hours after ingestion of the toxin-contaminated food. The incubation period and severity of symptoms depends on the amount of toxin consumed as well as an individual's susceptibility to the toxinⁱ. *Staphylococcus* food intoxication is the most common type of food intoxication. *S. aureus* contamination can occur when someone handles food with bare hands, especially after touching the face or mouth, or has an exposed sore on the hands or arms. Staphylococci are present in the nasal passages and throats and on the hair and skin of 50 percent or more of healthy individuals.

In order for staphylococcal food poisoning to occur, the following criteria must be present: (1) a food must be contaminated with enterotoxin-producing *S. aureus*; (2) the food must have the necessary requirements for bacterial growth; (3) adequate time and temperature must be present for the bacteria to multiply and produce enterotoxin; and (4) a sufficient amount of enterotoxin must be consumedⁱⁱ. Staphylococci thrive in protein-rich foods with high-salt content and grow in the temperature range of 45°F and 118°F. Heat-resistant enterotoxins are produced between the temperature range of 68°F and 99°Fⁱⁱⁱ. Foods commonly implicated in foodborne disease outbreaks caused by *S. aureus* include cooked meats, poultry, fish, cream-filled bakery products, and dairy-based productsⁱ.

Report authors: Sheri Anderson, Jamie DeMent, and Cheryl Banez-Ocfemia (Kansas Department of Health and Environment)

Investigated by:

Lyon County Health Department

420 West 15th Ave

Emporia, KS 66801

<http://www.flinthillshealth.org/>

Kansas Department of Agriculture

Division of Food Safety and Lodging

109 SW 9th St

Topeka, KS 66612

http://www.ksda.gov/food_safety/

Kansas Department of Health & Environment

Bureau of Surveillance and Epidemiology

1000 SW Jackson St., Suite 210

Topeka, Kansas 66612

www.kdheks.gov/epi

Kansas Department of Health & Environment

Bureau of Health Promotion

1000 SW Jackson St, Suite 230

Topeka, Kansas 66612

www.kdheks.gov/bhp

ⁱ Tranter, H.S. Foodborne Staphylococcal Illness. Lancet 1990; 336: 1044-1046.

ⁱⁱ Armstrong GL, Hollingsworth J, Morris, Jr. JG. Bacterial foodborne disease. In: Evans AS, Brachman PS, eds. Bacterial Infections in Humans: Epidemiology and Control. 3rd ed. New York: Kluwer Academic/Plenum Publishers, 1998:109-138.

ⁱⁱⁱ CDC. Outbreak of staphylococcal food poisoning associated with precooked ham – Florida, 1997. MMWR 1997;46:1189-1191.