Applying Tools, New and Used, in Foodborne Outbreak Investigation

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Presentation Objectives

• Describe outbreak details

• Investigation tools and strategies ("New and Used")

• Strategies to verify food safety practices were in place – post outbreak
Outbreak

• Wednesday, September 26, food premises owner reported customers of catered event on Saturday September 22\textsuperscript{nd}, ill with vomiting, bloody stool and diarrhea.

• On Sunday he learned some of the people who had attended the banquet had is concern that it may have been something he had served at the dinner led him to seek the assistance of public health.
• The business provides full service banquet catering throughout Southern Ontario and on September 22 three separate events had been catered, but only one resulted in illnesses.

• The investigation spanned a 4-week period including wait times for test results, HACCP results and epidemiological review of the results.
Background

- Three events were catered on September 22\textsuperscript{nd} at 3 separate sites. Food for all 3 events prepared in same kitchen and transported to each event for service at different times on same day.
- Event A - 74 guests. (about 150 km from prep kitchen)
- Event B – 40 guests. (about 25 km from prep kitchen)
- Event C - 190 guests (about 5 minutes travel from prep kitchen)
- All three events were supervised by the catering staff without help from the guests.
- Delivery and service at each event was carried out by three separate teams of catering staff.
Menu

• The same menu was provided for all three events; however, the food for Event A prepared before the food for the closer events.

• menu for all three events was the same: roast beef, roast chicken, mashed potatoes, gravy, mixed vegetables, Caesar salad, Greek salad, buns, condiments and carrot cake.
Recommendations

Based on interviews and several on-site inspections:

• Conduct HACCP audit or a partial audit due to the volume of meals prepared
• More attention to time/temperature control in the restaurant and at the service sites
• Improved time logs for restaurant preparation, transport, pre-service, service, cleanup and return to restaurant
• Change in cooling methods for large batches of food in restaurant – (i.e. shallower pans). 20 liter soup pots had been used to make gravy.
Recommendations, cont’d

• Additional indicating thermometers and sanitizing wipes available to staff at events

• Caution/disclaimer regarding release of leftovers from meals

• Additional training for all staff in safe food handling practices. All staff given 1 day FHT on site.
On-Line Questionnaire

• [http://fluidsurveys.com/s/Event_C_foodborne-illness-questionnaire](http://fluidsurveys.com/s/Event_C_foodborne-illness-questionnaire)

• Elgin St. Thomas Public Health has received a report of illness following consumption of food at a banquet organized by ___ and held at the ““Event C Site” on September 22, 2012.

• We are contacting people who attended the banquet to ask questions regarding this event to see if we can determine why people became ill and to prevent any additional people from becoming sick.
You do not have to participate in the survey if you do not want to. However, it is important that as many people as possible participate; even those who did not become ill. This helps us figure out what food items most likely caused people to get sick.

Please complete this survey by Monday October 1, 2012. It should take about 10 minutes to complete.

All of your responses will be kept strictly confidential; however, if you would rather talk to a public health professional directly, please call the Elgin St. Thomas Health Unit at (519) 631-9900 and ask for the Communicable Diseases Team.
On-Line Questionnaire, cont’d

• Good response to the survey. On-line and direct contact by phone.
• Analyzed by Epidemiologist.
• Helped inform scope of outbreak.
• Helped inform food specific attack rate table.
Clinical Sample Lab Results

- Stool sample results were negative for norovirus and all the usual tested pathogens (Salmonella, Campylobacter, E.coli, Yersinia, etc.)

- Positive Clostridium perfringens from a stool sample
Food Sample Lab Results

- Aerobic Plate Count (APC) 2000 per gram for the roast chicken and gravy. (standard is <1000)
- APC was reported as >1000 per gram for the gravy.
- No salmonella or campy found.
- The pH of the dressing was < 4.5 so it was not tested.
- **C. perfringens** at 300 per gram in the chicken.
• Based on a positive result in stool sample from an ill guest and a positive result from chicken sample, outbreak of *C. perfringens* was the most likely conclusion.
• *Clostridium perfringens* are spore-forming bacteria. They are found in soil, dust, sewage, and human and animal intestines. If consumed, these spores produce toxins (poison) in the intestinal tract, which can make you sick.
C. *perfringens*, cont’d

Symptoms may include:
- abdominal bloating and increased gas
- fatigue
- loss of appetite and weight loss
- muscle ache
- nausea
- profuse, watery diarrhea
- severe abdominal pain and stomach cramps
Symptoms of *C. perfringens* may occur within 6 to 24 hours after eating contaminated food. The usual onset time is 10 to 12 hours.

Most symptoms subside within 24 hours. However, some can last for up to two weeks.
C. perfringens, cont’d

- Typically this bacterium will grow in foods that are high in starch or high in protein, such as cooked beans, meat products, thick soups, and gravy.
- Leftovers that aren't cooled and reheated properly may contain a lot of the bacteria.
- The toxins are most commonly associated with foodborne illness, which can happen where food is made in large amounts, then allowed to cook slowly for several hours before consumption, and is allowed to cool slowly or is improperly refrigerated.
C. *perfringens*, cont’d

- Refrigerate all leftovers promptly in uncovered, shallow containers so they cool quickly.
- Very hot items can first be cooled at room temperature. Refrigerate once steaming stops.
- Leave the lid off or wrap loosely until the food is cooled to refrigeration temperature.
- Avoid overstocking the refrigerator to allow cool air to circulate freely.
- Ordinary cooking will not kill *C. perfringens* spores because some strains can survive at the boiling point (100° C or 212° F) for up to an hour.

• The meals for Event A were prepared and sent out early. The chicken had been cooked separately from that which went to Events B and C.

• Operator noted that the temperature of the food in the hot boxes continues to rise in transit, then it’s possible the product going the greater distance would have an increase in temperature thereby achieving a greater kill of microorganisms.
• The delivery time from the catering establishment to Event C site was estimated to be about 5 minutes. Pathogens could result in food poisoning.

• The Event C meal was set out soon after arrival, and left on chafing dishes, not stirred and had a reduced temperature for a longer time. There was a delay in guests arriving for meal. Potential for microorganisms in that portion of the meal to multiply to critical amounts.

• Events A and B were displayed and served quickly after arrival.
CCP Verification Process

• HACCP audit – Critical Control Point (CCP) monitoring at 2 different places (restaurant and service site) for event similar to Event C.

• Conducted during event on Saturday, October 13 at a site that was 15 minutes away from food premises kitchen.

• During three distinct time periods:
  - food preparation and cooking at food premises kitchen
  - transport and service to the event
  - pack up and return to the restaurant afterwards
CCP Verification

• HACCP Audits and CCP Monitoring performed by 2 PHIs at each end of the process.

• Communicated using text messaging on cell phones. Kept Manager updated as the day progressed.
CCP Verification

• Observed the preparation and packing of the meal.
• Observed arrival and service of the meal at event site.
• Observed the return of the vehicle and handling of the products back at the food premises kitchen.
• Temperatures and times observed to be in compliance with food safety standards.
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