case study

Outbreak at Mulligan Oaks: A logical approach to discovering food safety attributes

By Jack A. Neal and Mary Dawson

Introduction

The food service industry has a tremendous challenge of providing safe food for its consumers. The National Restaurant Association projected sales to be $604.0 billion in 2011, which accounts for approximately 4% of the gross domestic product for the United States (U.S.) meaning that over 70 billion meals were served at 960,000 commercial establishments by 12.8 million employees. This increase in dollars being spent at restaurants is directly proportionate to the increased risk of contracting a foodborne disease by unknowledgeable food handlers (Cotterchio, Gunn, Coffill, Tormey, & Barry, 1998). Foodborne illness is a significant issue affecting consumers in the U. S.. According to the Center for Disease Control, there are an estimated 9.4 million incidences of foodborne illnesses each year, with 55,961 hospitalizations and 1,351 deaths (Scallan, Hoekstra, Angulo, Tauxe, Widowson, Roy, Jones, & Griffin, *2011*). As future hospitality managers, it is important to understand these foodborne illnesses and have ways to implement preventive techniques so that this does not occur within your establishment.

Five of the most common factors directly relating to food safety within food service establishments include: Poor personal hygiene, inadequate cooking, improper hot holding temperatures, contaminated equipment, and food from unsafe sources (Scallan *et al, 2011)*. In examining factors that have led to foodborne diseases, Howes *et al*. (1996) found that improper food handler practices in both foodservice establishments and consumer homes accounted for approximately 97 percent of foodborne illnesses. Training employees on proper food handling practices is one of the most important procedures that foodservice establishments can implement. Another key component is ensuring that future managers understand the significance and implications of food safety and develop a food safety culture. Yiannis (2008) describes food safety culture as "how and what the employees in a company or organization think about food safety." The role of management is a critical factor for developing a food safety culture and managers need to control and change the behaviors of their employees so that good handling practices become a permanent fixture within the organization (Neal *et al,* 2012; Yiannis, 2008). This case study was developed to help future managers identify and understand which contributing factors they have control over and to be able to make recommendations for corrective actions.

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Learning Objectives

After completing this exercise students should be able to:

- Identify specific symptoms associated with various foodborne pathogens
- Interpret employee behaviors that contribute to foodborne illnesses and make recommendations for changing these behaviors in order to become permanent fixtures of standard operating procedures
- Distinguish which potentially hazardous foods are associated with specific pathogens
- Predict and draw conclusions as to which type of food, which employee, what behavior and what type of microorganism contributed to this outbreak

Scenario

Upon arriving to work on Tuesday morning, Victor Plum, the Mulligan Oaks Country Club general manager, received numerous messages from several of the distinguished members. All of the members had attended the club's annual "Get a Clue" party this past Saturday night. It's a murder mystery theme party based upon the Clue board game. Mr. Plum had actually worked the event and believed everything was well executed and a great time was had by all the attendees.

The first message was from Ms. Anna Sasin, heiress of a large weapon manufacturing mogul. Her grandparents were founding members of Mulligan Oaks. Prior to the party, Ms. Sasin insisted that the chef incorporate an oyster bar into the theme and her favorite finger foods which included the ham sandwiches and chicken tenders. In her message, Ms. Sasin went through the entire events of the night. She distinctly remembered valet parking her car at 7:58 p.m. right before the party began. First she went to the member's locker-room to freshen up. While checking her hair in the mirror, two employees were complaining about how tired they were. One of the ladies, Ms. White, complained of working a brunch that morning and now the party. She said that she was so tired that she lost track of what she was doing earlier and cut her hand. The other employee, Ms. Peacock had spent the previous night nursing her sick child who "had it coming out of both ends- a real Spew-nami." Ms. Peacock really wanted to call in sick because she was so tired but she couldn't afford to lose her hours because the rent was due next week. After leaving the party, Ms. Sasin became extremely nauseous and spent most of the night in her restroom.

The second message was from Mr. Tony Bologna, the meat mogul and newly elected Board President for the club. He proudly provided the meat for the event which was used for burgers, beef stew, and ham sandwiches. Mr. Bologna was extremely embarrassed because when he got up to reveal the killer and murder weapon his stomach started to rumble. Although everyone had a good laugh at his expense, Mr. Bologna had spent two days throwing up and dealing with severe diarrhea. He just knew that the meat served at the event could not be responsible for his illness. He said he spent a majority of the night at the oyster bar.

The third message was from Ms. Paige Turner, the romance novelist's assistant, who was actually calling from the hospital on Monday. Ms. Turner was admitted due to severe dehydration which was brought on by severe vomiting. The doctors believed that the illness was foodborne related. The assistant stated that Ms. Turner had tried "one of everything at the party" so it was difficult to determine the exact food item was causing this illness.

After listening to each message, Victor decided that he need to review the food that was served and see who was responsible for preparing and serving each item. According to the schedule, Ms. White worked in the ready to eat foods station, Ms. Peacock covered the oyster bar, Mr. Green prepared the burgers, the beef stew was made two days earlier by Ms. Scarlet, and Mr. Mustard prepared the frozen chicken tenders.

Victor decided to speak with each of his employees to find out what sanitation measures were followed during the food preparation. Ms. White proudly showed Victor that she used the proper colored cutting boards in order to slice the ham and then a different board for the lettuce and tomatoes. Ms. Peacock recalled washing her hands, checking that the oysters were served from approved sources, and that oysters were served on raw ice. Mr. Green also remembered washing his hands and then cooking the burgers to 155°F. Ms. Scarlet recollected cooling the stew to a temperature of 70°F within 2 hours and then checking again four hours later and found the temperature to be 41°F. On Saturday, Ms. Scarlet reheated the stew to an internal temperature of 165°F. Mr. Mustard claimed to use a bimetallic thermometer to ensure the chicken tenders were cooked to 165°F and held at 138°F.

Based upon the conversations with his employees, Victor then reviewed his training protocols for standard operational procedures regarding cooking, hand washing, temperatures, reheating, and holding food. Victor was pleased for the most part because his employees were able to describe specific food safety measures that they undertook to ensure a safe product. However, a few of the behaviors concerned him.

Next, Victor decided to review the common microorganisms responsible for food borne illnesses. Good thing he had kept his textbook from his Food Safety course in college. Here is what he read:

Microorganisms Guide

Escherichia coli O157:H7 is a pathogen that is associated with undercooked beef, unpasteurized milk or juice and contaminated produce. Sources of contamination include infected workers or contaminated water. Symptoms include severe abdominal cramping sudden onset of watery diarrhea, frequently bloody, sometimes vomiting and low-grade fever with an onset time of three to five days and lasts one to three days. Specific controls to prevent illness include cooking meat and poultry thoroughly, do not consume unpasteurized milk or dairy products and wash hands after using the restroom and before preparing or eating food.

Clostridium perfringens is associated with meat, poultry, gravies and stews made with meat. Sources of contamination include soil and the intestines of both animals and humans. Symptoms include severe abdominal pain and explosive diarrhea. The onset time is typically four to 24 hours and lasts24 hours. Control measures include cooling and heating food correctly and hot and cold holding at the correct temperatures.

Salmonella is one of the most common pathogens and effects millions of people each year. Outbreaks associated with raw meats, poultry, eggs, milk and dairy products and fish have been reported as well as with cookie dough, chocolate, peanut butter, cantaloupes, and other fresh produce. It is found in soil, sewage, insects and feces. Symptoms include nausea, vomiting, abdominal cramping and fever. The onset time is six to 48 hours and may last one to two days. Control measures include cooking food according to time and temperature guidelines. Preventing cross contamination is also critical. Finally, using proper hand washing techniques will also reduce the risk of salmonellosis.

Staphylococcus aureus is associated with foods that require handling during preparation, deli meats and salads that contain Temperature Controlled for Safety (TCS) foods such as chicken or seafood. This pathogen is commonly found on people including their hair, nose, throats and infected wounds. The symptoms include nausea, projectile vomiting and retching and cramps. The onset time can be as little as four hours but may take up to 96 hours before symptoms occur which may last three to five days. Control measures can be implemented by washing hands especially after touching hair, face or body, eating, drinking or smoking. Also it is important to cover wounds properly. Lastly, employees must hot hold foods at the proper temperature, cool foods properly and reheat properly by using a thermometer.

Norovirus can be contracted by high touch areas including food contact surfaces or door handles. Sources of this virus include contaminated water and infected employees. Symptoms include nausea, vomiting, abdominal cramps and diarrhea. The onset time is 24 to 48 hours with a duration of 24 to 60 hours. Control measures such as proper hand washing techniques and the prohibition of infected employees from working until symptom free and cleared by a doctor will reduce the risk of foodborne illness outbreaks.

Based on Victor's review of the food, the scheduled employees,

the microorganism guide, and the member's feedback, he attempted to determine the cause of the outbreak. He wanted to make sure this would never happen again.

After reading this scenario, you should be prepared to discuss the following questions:

1. What employee behaviors can we control when managing employees? Name specific ways that control measures can be put into the operation.
2. Which of the employee behaviors in this case study were followed correctly? Which of the employee behaviors were not followed correctly? What would you do as a manager to prevent this from happening again?
3. Using your current knowledge of the pathogens presented, which microorganisms could you eliminate based on the symptoms and associated food?
4. What type of food, which employee, what behavior, and which type of microorganism contributed to the outbreak? The Logic chart is to help you record information from the clues as well as the facts you deduce by combining information from different clues. We suggest you use an "X" for a "no" and a "■" for a "yes."
5. As a manager, what steps can you take to instill a food safety culture?
6. What should Victor communicate to those members who became ill? Should he address this with the entire membership?

Summary

This case study is designed to have students draw conclusions given symptoms associated with foodborne illness, identification of specific microorganisms, and to control for contributing factors such as employee behaviors. As future managers in the hospitality industry,

Table 1

Logic Chart

	Food					Behavior					Food Borne Illness				
	Burgers	Ham Sandwich	Chicken Tenders	Beef Stew	Oysters	Time/Temp Abuse	Poor Hygiene	Improper Cooling	Unapproved Sources	Improper Cooking	E. coli	Noro	Staph	Salmonella	C. perfringens
Employees															
Ms. White															
Mr. Mustard															
Mr. Green															
Ms. Peacock															
Ms. Scarlet															
Food Borne Illness															
E. coli O157:H7															
Norovirus															
Staph															
Salmonella															
C. perfringens															
Behavior															
Time/Temp															
Hygiene															
Improper Cooling															
Unapproved Sources															
Improper Cooking															