Food safety and sanitation is always a hot topic in all segments of food service. If you have long-term employees, it may be a challenge to keep them motivated and current with the many changes. If you have new employees, where do you start and how much do you cover at a time? Are you prepared for training the adults in your department? Most dietitians and managers lack a background in education and/or training and struggle with this responsibility. Sanitation training is required at least annually by many local regulatory agencies. The annual cost of foodborne illness outbreaks is billions of dollars. Spending a few dollars on training is one of the best insurance policies to prevent foodborne illness. Before we can consider training, let’s back up and see why food safety is so important and learn what is going on with foodborne illnesses. Having a better sense of the relationship between contaminated foods and illness supports food safety along the entire food production chain—from fields where food is grown to cutting boards in kitchens. (See Figure 1)

The Centers for Disease Control and Prevention (CDC) estimates that each year roughly 1 in 6 Americans (or 48 million people) get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases. Food poisoning not only sends many Americans to the hospital each year, it can also have long-term health consequences. Hemolytic-uremic syndrome (HUS) is a serious illness that usually occurs when an infection in the digestive system produces toxic substances that destroy red blood cells, causing kidney injury. HUS may occur after a gastrointestinal infection with some kinds of E. coli bacteria. It also been linked to other gastrointestinal infections, including shigella and salmonella. HUS can require intensive care, kidney dialysis, and transfusion.

Food poisoning can happen anywhere, to anyone, and from foods we might not expect. Public health surveillance, such as that conducted by the Foodborne Diseases Active Surveillance Network (FoodNet), provides needed data for tracking trends.

FoodNet has given us snapshots of the progress in reducing Escherichia coli (E. coli) O157 and other foodborne infections since 1996. Foodborne diseases monitored through FoodNet include infections caused by the bacteria Campylobacter, E. O157, Listeria, Salmonella, Shigella, Vibrio, and Yersinia, and the parasites Cryptosporidium and Cyclospora. The data collected by FoodNet also lets the CDC, its partners, and policy makers know how much progress has been made in reaching national goals for reducing foodborne illness. Each year, FoodNet reports on the changes in the number of people in the United States sickened with foodborne infections that have been confirmed by laboratory tests.

Overall, the 2012 FoodNet data showed a lack of recent progress in reducing foodborne infections and highlight the need for improved prevention. (See Food Safety Progress Report 2012 - www.cdc.gov/features/dsfoodnet2012/)

- FoodNet identified 19,531 laboratory-confirmed cases of infection.
  - The incidences of laboratory-confirmed Campylobacter, Cryptosporidium, Salmonella, Shiga toxin-producing Escherichia coli (STEC) O157 and non-O157, Shigella, and Yersinia infection were highest among children aged <5 years.
The incidences of Listeria and Vibrio infection were highest in adults aged ≥65 years.

- The incidences of laboratory-confirmed Listeria, Salmonella, Shiga toxin-producing Escherichia coli (STEC) O157, and Yersinia infection did not change significantly in 2012 compared with 2006–2008.
- Campylobacter was the second most common infection reported in FoodNet (14.3 cases reported per 100,000 population). Incidence of infection was 14% higher in 2012 compared with 2006–2008.
  - Campylobacter infections are usually self-limited, but may result in severe complications such as Guillain-Barré syndrome (a type of paralysis), and arthritis.
  - Exposures related to Campylobacter infection include consumption of undercooked poultry, raw milk, produce, untreated water, and contact with young animals.
- Vibrio infections are rare (0.41 cases reported per 100,000 population). Incidence of Vibrio infection was 43% higher in 2012 compared with 2006–2008.
  - Some types of Vibrio infections are often serious.
  - Many Vibrio infections are acquired by eating raw oysters. These infections are most common during warmer months when waters naturally contain more Vibrio organisms.
  - Infections can be prevented by thoroughly cooking oysters and by not exposing wounds to bodies of warm seawater.
- As a group, the incidence of infection with six key pathogens transmitted commonly through food (Campylobacter, Listeria, Salmonella, E. coli O157, Vibrio, and Yersinia) was not significantly different in 2012 than in 2006–2008.

Comparison with the first three years of FoodNet surveillance (1996–1998) shows some clear changes:

- The incidence of infections caused by Campylobacter, Listeria, STEC O157, Shigella, and Yersinia has declined, mostly in the first years.
- The overall incidence of Salmonella infections was unchanged, but the incidence of some types of Salmonella have increased while others have decreased.
- The incidence of Vibrio infection is now 116% higher.
- The overall incidence of infection with six key foodborne pathogens (Campylobacter, Listeria, Salmonella, STEC O157, Vibrio, and Yersinia) was 22% lower.

Most foodborne illnesses can be prevented. Some progress has been made in decreasing contamination of some foods and reducing illness caused by some pathogens. Recent efforts to reduce contamination of food and prevent these illnesses include:

- Establishment in 2011 of performance standards for Campylobacter contamination of whole broiler chickens in processing plants.
- Approval of more stringent time and temperature controls for oysters after harvest to prevent Vibrio vulnificus infections.
- The Food Safety Modernization Act of 2011 gives the FDA additional authority to regulate food facilities, establish standards for safe produce, recall contaminated foods, oversee imported foods, and which requires improvements in surveillance and response to outbreaks. It calls on CDC to strengthen surveillance and outbreak response.

The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of food safety laws in more than 70 years, was signed into law by President Obama on January 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it. To learn more about FSMA, go to www.fda.gov.

When two or more people get the same illness from the same contaminated food or drink, the event is called a foodborne outbreak. Public health officials investigate outbreaks to control them, so more people do not get sick in the outbreak, and to learn how to prevent similar outbreaks from happening in the future. CDC and partners ensure rapid and coordinated surveillance, detection, and response to multistate foodborne outbreaks. So far in 2013 there have been multi-state outbreaks relating to the following:

- Tahini Sesame Paste – Salmonella Montevideo and Salmonella Mbandaka – 8 people in 6 states, no hospitalized or deaths, resulting in a recall of the product
- Live Poultry – Salmonella Typhimurium – 146 people in 26 states, 27 hospitalized, no deaths

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• Live Poultry – Salmonella Infantis and Mbandaka – 61 people in 18 states, 12 hospitalized, no deaths.
• Cucumbers – Salmonella Saintpaul – 81 people in 18 states, 16 hospitalized, no deaths.
• Frozen Food Products – Escherichia coli O121 – 124 people in 13 states, 7 hospitalized, no deaths, resulting in a recall of the product.
• Chicken – Salmonella Heidelberg – 128 people in 13 states, 32 hospitalized, no deaths.
• Ground Beef - Salmonella Typhimurium- 22 people in 6 states, 7 hospitalized, no deaths, resulting in a recall of this product.
• Hedgehogs – Salmonella Typhimurium – 23 people, 9 states, 7 hospitalized, 1 death.

As new foodborne problems emerge, several questions need to be answered before the problem can be successfully controlled. Some pressing unanswered questions include:

• How do the foodborne pathogens spread among the animals themselves, and how can this be prevented? This includes E. coli O157:H7 among cattle, Salmonella Enteritis among egg-laying hens, and Campylobacter in broiler chickens. If we could prevent the animals from becoming infected in the first place, we would not have as much illness in the humans who eat them.
• What is the microbial cause of outbreaks in which no pathogen can be identified by current methods? This is true for over half of the reported foodborne outbreaks. Will wider application of existing experimental diagnostic methods help, or are these outbreaks caused by pathogens we simply do not yet know how to identify?
• What would be the impact of basic food safety education of restaurant workers on the risk of foodborne disease among restaurant patrons?
• How can the food and water that animals consume be made safer?
• How can we dispose of animal manure usefully, without threatening the food supply and the environment?
• How can basic food safety principles be most effectively taught to school children?
• How can we be sure food safety standards in other countries are as good as those in the United States? As we import more of our fresh foods from other countries, we need to be confident that they are produced with the same level of safety as food in the United States.
• What control strategies in the slaughter plant will reduce the contamination of poultry meat with Campylobacter?
• How can irradiation pasteurization of certain high risk foods, such as ground beef, be used most effectively?
• How do raspberries in Central America get contaminated with Cyclospora in the first place? Does this parasite have an animal reservoir?
• How can alfalfa sprouts and other raw sprouts be produced safely? Sprouts are unique among foods in that the conditions for sprouting are also perfect for bacterial growth, and they are not cooked after that.

Determining where to target prevention efforts that will reduce foodborne infections requires continued collection of information to understand sources of infection, implementation of measures known to reduce food contamination, and development of new measures. Hopefully you will never see the name of your facility in the headlines for a foodborne outbreak. Every food service department must be vigilant in order to prevent foodborne illness outbreaks. This includes during purchasing, receiving, storage, preparation, cooking, service, cooling.

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