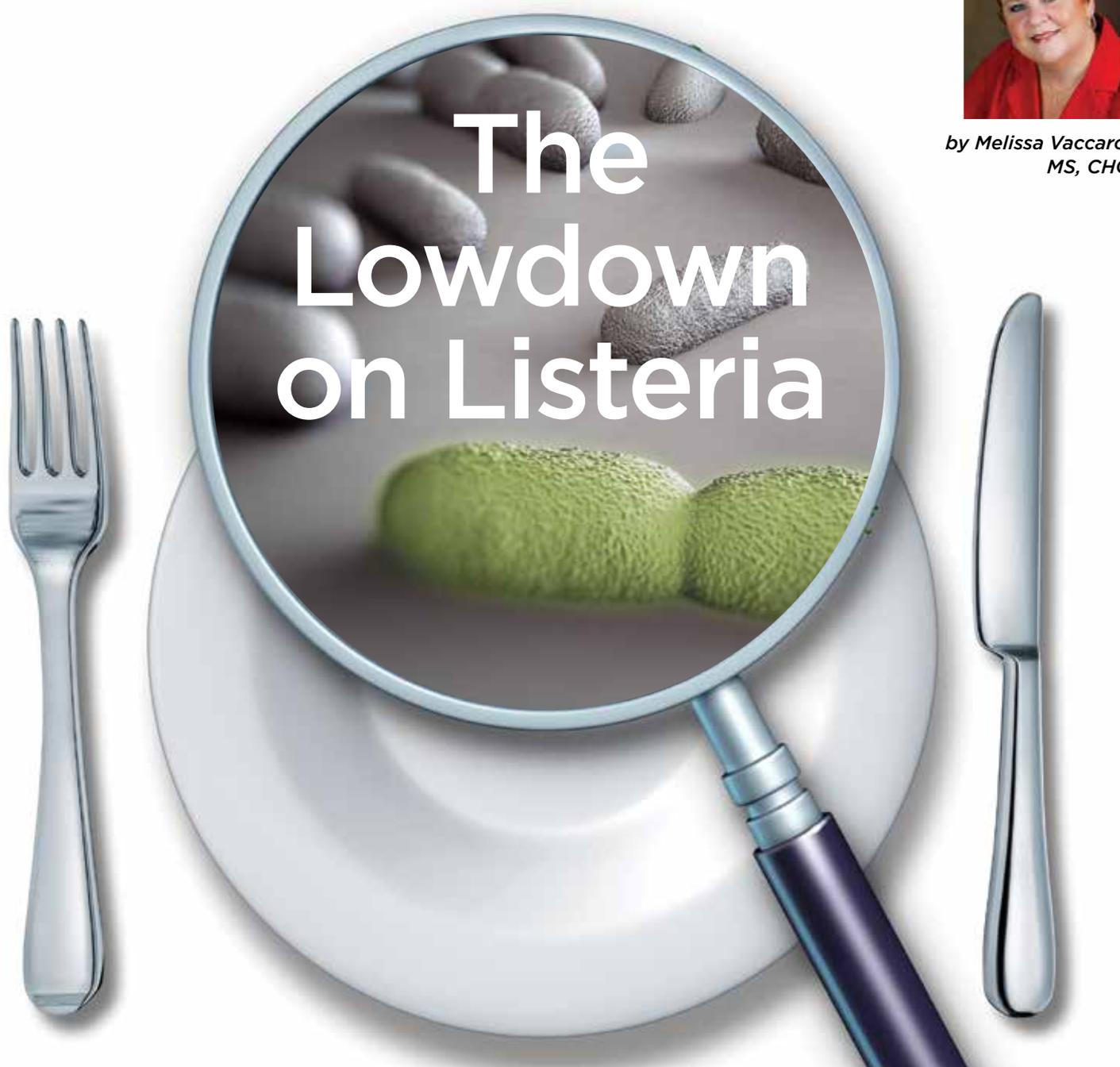




by Melissa Vaccaro,
MS, CHO

A magnifying glass with a purple handle is positioned over a white plate. The plate contains several pieces of food: two green avocados in the foreground, and several pieces of bread or rolls in the background. A silver fork is on the left and a silver knife is on the right of the plate. The title 'The Lowdown on Listeria' is written in large white letters across the center of the magnifying glass.

The Lowdown on Listeria

Although not one of the Big 6 Foodborne Pathogens recognized in the 2013 FDA Food Code, *Listeria monocytogenes* (LM) is a foodborne pathogen of concern in the food industry, especially for those who serve a Highly Susceptible Population (HSP).

Listeria infection or listeriosis is an illness typically caused by eating food contaminated with the bacteria *Listeria monocytogenes*. According to the Centers for Disease Control and Prevention (CDC), an estimated 1,600 people in the US get sick from the Listeria germ annually; of these 260 die. At least 90 percent of the people who get listeria infections are in the HSP group. Listeriosis is relatively uncommon; however, the fatality rate can be as high as 30 percent among at-risk individuals.

Like many bacteria, LM can affect people differently. Healthy people can have limited or even no symptoms if exposed. However, for persons who fall into the HSP category, LM can be very serious or deadly. In 2001, LM was added to the list of nationally notifiable diseases by CDC, which means all health-care providers must report cases of listeriosis, and public health officials must interview all people with listeriosis promptly.

In recent years, you may recall several listeriosis outbreaks:

- 2013—Farmstead Cheeses: 6 cases, 5 states, 1 death, 5 hospitalizations
- 2012—Ricotta Salata Cheese: 22 cases, 14 states, 4 deaths, 20 hospitalizations
- 2011—Whole Cantaloupes—largest outbreak in US history: 147 cases, 28 states, 33 deaths, 1 miscarriage

LISTERIA—THE BACTERIA

LM is a facultative anaerobic bacterium. This basically means it is capable of surviving in the presence or absence of oxygen. Unlike some bacteria, Listeria can grow slowly at refrigerator temperatures as well, which is why it is often associated with meats, milk, or vegetable products that have been held at refrigeration for long periods of time. These two characteristics can make Listeria a tricky bug to control. Listeria bacteria, however, are not spore formers and can be killed by proper cooking temperatures.

WHERE IS LM FOUND?

The bacterium, Listeria, is widespread and commonly found in soil, silage, sewage, birds, and animals. It can also be found in a variety of foods including raw meats, raw vegetables, raw milk and some processed foods, such as hot dogs, soft cheeses, pâté, and coleslaw. Listeria can grow in those forgotten places that are cool, dark and wet; so be cautious of and remember to properly clean refrigerators, floor drains, air vents, grease traps, cracks and crevices of food equipment such as meat slicers, and other similar areas.

WHO'S AT RISK?

The following groups are at increased risk for *Listeria* infection:

Pregnant women: About one in seven (14 percent) cases of *Listeria* infection occurs during pregnancy. Infection during pregnancy can cause fetal loss (miscarriage or stillbirth), pre-term labor, and illness or death in newborn infants.

- Pregnant women are about 10 times more likely than the general population to get *Listeria* infection.
- Pregnant Hispanic women are about 24 times more likely than the general population to get *Listeria* infection.

Older adults: More than half (58 percent) of *Listeria* infections occur among adults 65 and older.

- Adults 65 years and older are about 4 times more likely than the general population to get *Listeria* infection.

People with weakened immune systems: Individuals within this group are also considered high risk for *Listeria* infection due to underlying medical conditions such as cancer and immunosuppressive therapy (i.e., steroids, chemotherapy, radiation), liver or kidney disease, diabetes, alcoholism, and HIV/AIDS.

SYMPTOMS OF LM

It's possible for a healthy person to be exposed to LM and not be affected at all. If symptoms develop they may include:

- Fever
- Headache
- Tiredness
- Aches and pains
- Diarrhea
- Nausea
- Abdominal cramps
- Stiff neck
- Confusion
- Convulsions



If symptoms progress, a more serious illness may develop to include:

- Meningitis (brain infection)
- Septicemia (blood poisoning)

Continued on page 14

Pregnant women typically experience fever and other non-specific symptoms, such as fatigue and aches. However, infections during pregnancy can lead to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn. There is a plethora of information on the web for pregnant women regarding listeriosis prevention that anyone expecting or planning to have a child should become familiar with.

Unlike what most people believe, you do not “get sick” with LM immediately after consuming contaminated foods. Like most pathogens, there is a time period in which the pathogen is incubating within the body before outward symptoms appear, the onset time. For LM, the average onset time is three weeks; however, symptoms may appear between 9-48 hours for gastrointestinal symptoms and up to 70 days after consumption. The



duration of listeriosis is variable from days to weeks, depending on the health of the individual and severity of the illness.

Individuals infected with LM can excrete the bacteria in their feces for several months after exposure.

PREVENTION OF LISTERIA INFECTION

Recommendations for the General Population

Wash and handle food properly

- Rinse raw produce, such as fruits and vegetables, thoroughly under running tap water before eating, cutting, or cooking. Even if the produce will be peeled, it should still be washed first.

- Scrub firm produce, such as melons and cucumbers, with a clean produce brush.
- Dry the produce with a clean cloth or paper towel or air dry in a clean area on a clean surface.
- Separate uncooked meats and poultry from vegetables, cooked foods, and ready-to-eat foods.

Keep your kitchen and environment cleaner and safer

- Clean and properly sanitize hands, knives, countertops, and cutting boards after handling and preparing uncooked foods.
- Be aware that *Listeria monocytogenes* can grow in foods in the refrigerator. Use a thermometer to check the temperature inside your refrigerator daily. The refrigerator should be kept at 41°F or lower and the freezer at approximately 0°F.
- Clean up all spills in your refrigerator right away—especially juices from hot dog and lunch meat packages, raw meat, and raw poultry.
- Clean the inside walls and shelves of your refrigerator with hot water and liquid soap, then rinse. Sanitize properly once clean.

Choose safer foods. Do not drink raw (unpasteurized) milk, and do not eat foods that have unpasteurized milk in them if they have not subsequently been fully cooked.

Cook meat and poultry thoroughly

- Thoroughly cook raw food from animal sources—such as beef, pork, or poultry—to a safe internal temperature. Verify these temperatures with a calibrated food thermometer.

Store foods safely

- Use precooked or ready-to-eat food as soon as you can. Once opened, date mark all ready-to-eat foods to be held more than 24 hours with instructions for discarding after 7 days. This day or date may not exceed the manufacturer’s use-by date if the manufacturer determined the use-by date based on food safety, not food quality. Store at 41°F or below.

Answers to FPC Review Questions

CDMs who answer the FPC Review Questions on page 17 of this issue can check their responses against the answer key found on page 37. This “self check” allows you to confirm your understanding of the test questions.

- Hot Dogs, Luncheon and Deli Meat—Once opened, date mark all ready-to-eat foods to be held more than 24 hours with instructions for discarding after 7 days. This day or date may not exceed the manufacturer’s use-by date if the manufacturer determined the use-by date based on food safety, not food quality. For commercially packed and unopened product, freeze product before the manufacturer’s use-by date. Once thawed, use immediately.
- Divide leftovers into shallow containers to promote rapid, even cooling. Cover with airtight lids or enclose in plastic wrap or aluminum foil. Use leftovers within 3 to 4 days, but do not exceed 7 days. Date marking rules apply to leftovers as well.

Choose safer foods

- Do not drink raw (unpasteurized) milk, and do not eat foods that have unpasteurized milk in them if they have not subsequently been fully cooked.

CDC RECOMMENDATIONS FOR PERSONS AT HIGHER RISK

Meats

- Do not eat hot dogs, luncheon meats, cold cuts, other deli meats (e.g., bologna), or fermented or dry sausages unless they are heated to an internal temperature of 165°F or until steaming hot just before serving.
Avoid getting fluid from hot dog and lunch meat packages on other foods, utensils, and food preparation surfaces, and wash hands after handling hot dogs, luncheon meats, and deli meats.
- Pay attention to labels. Do not eat refrigerated pâté or meat spreads from a deli or meat counter or from the refrigerated section of a store. Foods that do not need refrigeration, like canned or shelf-stable pâté and meat spreads, are safe to eat. Refrigerate after opening

Soft Cheeses

- Do not eat soft cheese such as feta, queso blanco, queso fresco, brie, Camembert, blue-veined, or panela (queso panela) unless it is labeled as Made with Pasteurized Milk.
 - > Be aware that Mexican-style cheeses made from pasteurized milk, such as queso fresco, likely contaminated during cheese-making, have caused *Listeria* infections.

Seafood

- Do not eat refrigerated smoked seafood unless it is contained in a cooked dish, such as a casserole, or unless it is a canned or shelf-stable product.



Persons at higher risk should not eat refrigerated smoked seafood unless it is contained in a cooked dish, such as a casserole, or unless it is a canned or shelf-stable product.

- Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna, and mackerel, is most often labeled as “nova-style,” “lox,” “kippered,” “smoked,” or “jerky.”
- These fish are typically found in the refrigerator section or sold at seafood and deli counters of grocery stores and delis.
- Canned and shelf stable tuna, salmon, and other fish products are safe to eat

SAFETY TIPS FOR EATING MELONS

Follow this general FDA advice for melon safety.

- Consumers and food preparers should wash their hands with warm water and soap for at least 20 seconds *before* and *after* handling any whole melon, such as cantaloupe, watermelon, or honeydew.
- Scrub the surface of melons, such as cantaloupes, with a clean produce brush under running water and dry them with a clean cloth or paper towel before cutting. Be sure that your scrub brush is sanitized after each use, to avoid transferring bacteria between melons.
- Promptly consume cut melon or refrigerate promptly. Keep your cut melon refrigerated at or less than 41°F (32-34°F is best), for no more than 7 days.
- Discard cut melons left at room temperature for more than 4 hours.

There is no magic formula when it comes to listeriosis prevention. The food industry, food retailers, restaurants, the government, scientists, doctors, and consumers need to work together to prevent this illness. There are three basic fundamental strategies to prevent LM:

Continued on page 16



Promptly consume cut melon or refrigerate promptly. Keep your cut melon refrigerated at or less than 41°F (32-34°F is best), for no more than 7 days.

- Prevent the growth of LM in ready-to-eat foods
- Prevent the contamination of foods that support the growth of LM
- Target education messages to high-risk consumers and their caregivers

LISTERIOSIS PREVENTION REQUIRES TEAMWORK

The **food industry** takes seriously its responsibility and commitment to public health. Now, with the onset of the FDA Food Safety Modernization Act, food processors will be held to even stricter rules regarding food safety. Among their tools, food processors use a proactive preventive system called Hazard Analysis and Critical Control Point (HACCP) to make sure that foods are properly cooked to destroy *Listeria monocytogenes* and other harmful bacteria. They also clean and monitor the processing environment to reduce the potential for contamination of product after processing, which includes environmental and product sampling. Good Manufacturing Practices (GMPs) and the design of the equipment used in processing help prevent contamination.

Retailers and foodservice operators can educate food employees about avoiding cross-contamination between raw and cooked products, proper cooking temperatures, proper cleaning and sanitizing techniques, and other safe food handling and preparation procedures that will reduce the likelihood of LM contamination within the kitchen. Even at the basic level, food employees need to be taught about bacteria and how they grow. With knowledge comes empowerment. Employees who understand why they are being asked to do a task a specific way are much more likely to do it right.

Consumers can learn and implement safe food handling and preparation procedures in the home, including prevention of cross-contamination between raw and cooked products, keeping refrigerators as cold as possible, cooking food thoroughly, limiting refrigeration storage time for foods that allow *Listeria monocytogenes* to grow, and keeping refrigerators clean. Consumers who are pregnant or immune compromised must educate themselves on potential life threatening pathogens such as LM.

The **medical community** can educate patients and their caregivers about listeriosis and preventive measures. This is especially important for members of at-risk populations, including the immuno-compromised, the elderly, and pregnant women.

With scientific and food industry improvements, the potential to further improve listeriosis prevention strategies is encouraging; however, all stakeholders must work together for the most effective prevention strategy. 🍌

Melissa Vaccaro, MS, CHO is a Food Program Specialist for the PA Department of Agriculture and an Executive Board Member for the Central Atlantic States Association of Food and Drug Officials (CASA). She is co-author of the SURE™ Complete HACCP Food Safety Series, which features HACCP manuals for managers, employees, and trainers. Contact her at mvaccaro86@gmail.com

Sources

www.cdc.gov

www.fda.gov

Centers for Disease Control and Prevention. *Vital Signs: Listeria Illnesses, Deaths, and Outbreaks - United States, 2009-2011. MMWR Morbidity and Mortality Weekly Report. 2013; 62(22):448-52.*

Scallan E, Hoekstra RM, Angulo FJ, Tauxe RV, Widdowson MA, Roy SL, Jones JL, Griffin PM. *Foodborne Illness Acquired in the United States—Major Pathogens. Emerging Infectious Diseases. 2011; 17(1):7-15.*