Guidance for the Control of *Listeria monocytogenes* Risks in Retail Food Stores

FMI®
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Food Marketing Institute (FMI) conducts programs in research, education, industry relations and public affairs on behalf of its 1,500 member companies — food retailers and wholesalers — in the United States and around the world. FMI's U.S. members operate approximately 26,000 retail food stores with a combined annual sales volume of $340 billion — three-quarters of all retail food store sales in the United States. FMI's retail membership is composed of large multi-store chains, regional firms and independent supermarkets. Its international membership includes 200 companies from 60 countries.

Statement of Purpose

The purpose of this guide is to:

- Provide basic information about the bacterium *Listeria monocytogenes* and the disease it can cause, called listeriosis.

- Remind retailers about the practices and behaviors that can help reduce the risk of *Listeria monocytogenes* in retail and wholesale food stores.

The guidance in this document, while directed at controlling *Listeria monocytogenes*, is equally useful for controlling other causes of foodborne illness. These recommendations for good retail practices will help ensure a safe and sanitary environment, minimize the possibility of contaminated food and help protect against many types of harmful bacteria.

This guidance document was developed by retailers, scientists and food safety experts. The information provided in this guide is based on the FDA Food Code, which is described later in this document. You should always check with state or local authorities to verify the specific regulatory requirements in jurisdictions where you operate stores.

Background

Food Marketing Institute (FMI) members developed an action plan for controlling the risk of *Listeria monocytogenes* (*Lm*) in retail food stores, including supermarkets, wholesalers, small grocery stores and convenience stores. One action item is to:

Develop a guidance document detailing recommended best practices for controlling *Listeria monocytogenes* risks in retail food stores.

This Guidance for the Control of *Listeria monocytogenes* Risks in Retail Food Stores contains practical, real-world guidance for all retailers, including small operators who may have limited microbiological testing capabilities, record-keeping systems or access to scientific expertise.

The guidance document focuses on control strategies that will most likely reduce the risk of *Listeria monocytogenes* and other harmful bacteria in food items prepared and handled in stores. It targets specific activities, including:

- Temperature control for safety
- Preparation and handling
- Cleaning and sanitizing
- Facility maintenance and repair
- Personal health and hygiene

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Introduction

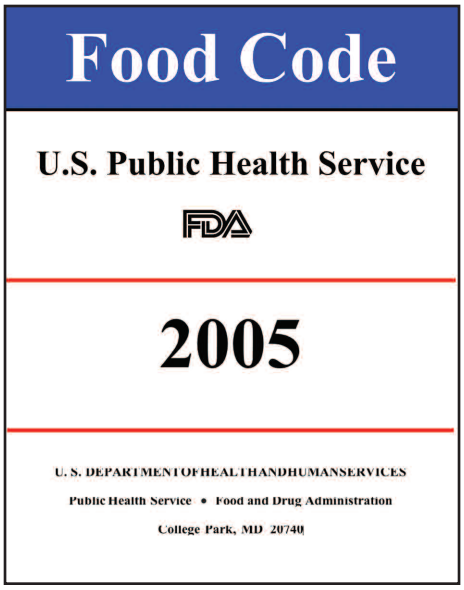
In the retail food store, the best defense against bacteria that cause foodborne illness is to follow good retail practices (GRPs). These basic sanitation and handling practices should be part of your daily operation, including:

- Ensure employee health and hygiene
- Handle food properly
- Maintain time and temperature controls
- Prevent cross-contamination
- Institute effective cleaning and sanitizing procedures

These food safety fundamentals should be a part of your daily operations. State or local authorities are available to help ensure you have good retail practices in place. The recommendations in the FDA Food Code (see sidebar) include all the information you need to develop your own GRPs – which, when properly implemented, provide the best tools to control the risk of foodborne pathogens, including *Listeria monocytogenes* (*Lm*).

The FDA *FOOD CODE*
The Food Code is the Food and Drug Administration's recommended best practices for the safe preparation, handling and serving of food. Most state and local food regulatory agencies use this code as the basis for their own food safety laws and regulations. The Food Code emphasizes the practices that are known to prevent, eliminate or reduce the risk of foodborne illness. The complete Food Code is available on the FDA Website at www.cfsan.fda.gov .

The 2005 edition of the *Food Code* is now available

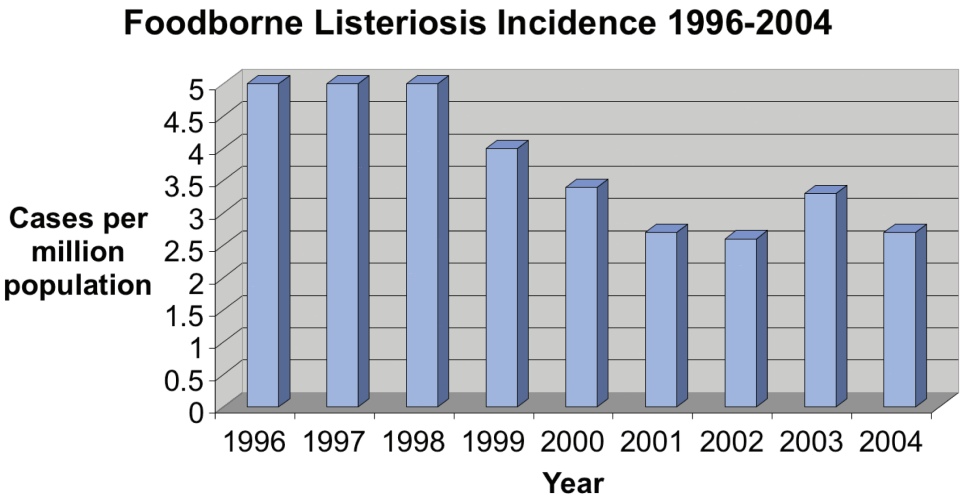


Listeria monocytogenes and listeriosis

Listeria is the name given to a group of bacteria widely distributed throughout nature, many of which are harmless. One type, however, called *Listeria monocytogenes* (*Lm*) is of concern because it can cause the human illness listeriosis.

Bacteria that can cause human illness are called pathogens, and some pathogens can be transmitted to people through food, such as Salmonella and *Lm*. Cooking will kill pathogens such as *Lm*, but if it is in a ready-to-eat (RTE) food that is consumed without further cooking, a person could get listeriosis. Whether a person exposed to *Lm* will get sick depends on several factors, including how much of the bacteria is in the food they eat and if they are susceptible or vulnerable to the bacteria.

Lm exists widely in the environment (soil, plants and water), animals, the home, food and retail stores. Even though many people are exposed to *Lm*, it is rare to get sick from the bacteria. The chart below shows the incidence rate of foodborne listeriosis over the years 1996 to 2004. However, listeriosis is one of the most serious foodborne illnesses, and can be fatal. Certain groups of people are at higher risk for getting listeriosis. These include the elderly and those who have a preexisting illness that reduces the effectiveness of their immune system. Another high-risk group is pregnant women since *Lm* can infect an unborn child, causing serious complications, even death.



Source: Centers for Disease Control, FoodNet Data on the Incidence of Foodborne Illness, 1996-2004 Incidence is the number of cases divided by the current census population

Even though almost all cases of listeriosis are foodborne, the particular food contaminated with *Lm* that causes the illness is often unknown. This is due in part to factors such as:

- *Lm* has an incubation period of from two to 70 days (The incubation period is the time it takes to show symptoms of the illness after consuming contaminated food).
- Susceptible people may develop illness while others who eat the same food may have no symptoms.
- Handling and preparation of food will affect whether or not it can cause illness; for example, *Lm* is destroyed by heating.
- Often just a single person is ill and the food source is not evident. Usually a specific food vehicle is identified only if there is an outbreak with many cases and a subsequent investigation.

Foods With High Risk

The Food and Drug Administration (FDA), along with the U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS) and the Centers for Disease Control and Prevention (CDC), conducted a risk assessment to determine which foods were most likely to cause listeriosis. As a result of this assessment, certain RTE foods were ranked from very high to very low risk. The ranking can be used to focus control measures on those foods that are more likely to pose a risk to consumers. A chart showing the foods and their ranking is included in this document as Appendix B.

Source of Lm at Retail

Controlling *Lm* in retail food stores is a challenge because it can so easily be brought into the store on food, equipment, packaging and even people. It is not unusual to find *Listeria* in a facility such as a supermarket, which is open to the public and where there is a considerable flow of people, food and equipment. *Lm* can hide in difficult to clean places and persist for years. *Lm* also has unique characteristics that make it different from the other pathogens. The most significant difference is that *Lm* can multiply at refrigeration temperatures, unlike other bacteria which do not grow in cold temperatures.

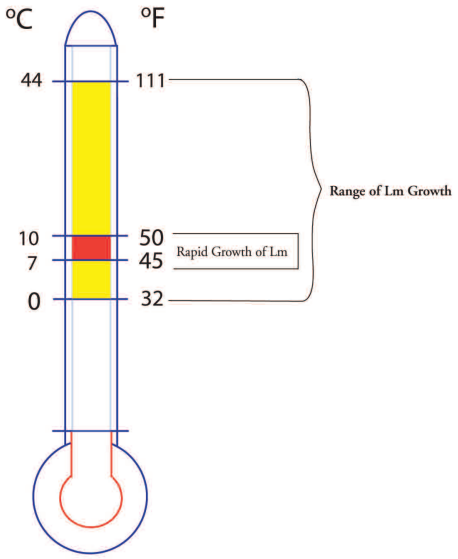
❖The cool, moist conditions found in a retail facility can create a perfect environment for Lm growth.

Ready-to-Eat Foods

Lm is destroyed by heat, but it can recontaminate foods when they are handled after cooking. This includes wrapping, cutting, slicing, portioning and serving RTE foods. Such foods can become contaminated by contact with an unclean surface, and they can cross-contaminate other products by touching other items such as equipment, utensils or other foods. Because RTE foods, such as deli salads, smoked fish, soft cheeses, hot dogs and luncheon meats, might not receive any further cooking before they are consumed, they have a greater potential to cause listeriosis.

Time and Temperature

Perhaps the most challenging characteristic of *Lm* is its ability to survive and grow in refrigerated temperatures. Most pathogenic bacteria do not grow when held in cold conditions, but *Lm* can grow in a wide range of temperatures from 32° F to 111°F (1°C–44°C). *Lm* can multiply rapidly in the range of 45°F to 50°F (7°C–10°C). Although initially only low levels of *Lm* may be present, the organism can multiple to high numbers over time, and these levels can be sufficient to cause illness.



Temperature Ranges for Growth of Lm

PHF and TCS

In the past, the FDA has used the term Potentially Hazardous Food (PHF) to identify foods requiring temperature control for safety because they support the rapid and progressive growth of pathogens or toxin formation when not refrigerated. By definition, PHF includes foods of animal origin that are raw or heat-treated, and other food items such as raw seed sprouts and cut melons, among others. PHF was used to identify those foods which, if not temperature controlled, could potentially cause foodborne illness. FDA recognized that the name and definition of PHF was confusing and, in the 2005 Food Code, introduced a new name and definition, Time/Temperature Control for Safety Foods or TCS. TCS is defined as foods that require time and/or temperature control to limit pathogenic microorganism growth or toxin formation. The terms PHF and TCS are now used interchangeably by FDA. The process for determining if a food is TCS is described in the 2005 Food Code.

Control Strategies

Good retail practices (GRPs) are the basic sanitation and handling measures that should be part of your daily operation. GRPs, like those included in the FDA Food Code, provide sufficient controls for minimizing foodborne risks at retail. The control strategies in this guidance document specifically highlight those actions that are most likely to control *Lm* in retail stores.

Lm controls target foods that are more likely to be contaminated with the pathogen, which have the following characteristics:

- Very high-risk and high-risk foods based on the FDA/FSIS/CDC risk ranking in Appendix B.
- Ready-to-eat foods.
- Foods that are exposed or taken out of the original packaging in the store.
- Foods that can support the growth of *Lm*.
- Foods that are temperature controlled for safety.
- Foods that are generally kept in a retail store for more than 24 hours.

❖**NOTE: Where recommendations in this guidance document differ from state and local regulations, the regulatory requirements that govern your establishment should be followed.**

Interventions

Interventions that prevent or minimize growth can be an important control strategy in preventing illness. Some may even reduce the level of *Lm* in a food, although the intervention may not be sufficient to eliminate all pathogens.

Two factors that affect *Lm* growth in food are the amount of water in the product (called water activity or A_w) and the acidity of the food (called the pH). For example, a pH of less than 4.4 or a water activity of less than 0.92 can promote microbiological safety and stability in many RTE foods, including some deli meats and salads. Retailers might want to check with their suppliers to determine which foods do not support the growth of *Lm* or specifically request these products in the buyer specifications

Some products can be formulated to make them less likely to allow the growth of *Lm*. The use of Generally Recognized as Safe (GRAS) or other approved additives or preservatives at safe levels may minimize, reduce or prevent the growth of *Lm* in various foods. See sidebar for an explanation of GRAS products. For example, some deli salads made with lemon juice (which is an acidifier) might have a low enough pH to prevent the growth of *Lm*. Examples of approved additives and preservatives include:

GRAS
A generally recognized as safe (GRAS) substance is one that has a proven track record of safety when used in food, based on a history of common use in food before 1958 or on published scientific evidence, and that need not be approved by the FDA prior to being used.

- Salts used in combination with other compounds in curing meats, e.g., NaCl, nitrites.
- Vinegar (acetic acid)
- Citric acid
- Sorbate (sorbic acid).
- Plant extracts, herbs and spices, e.g., eugenol, pimento leaf, horseradish distillates, rosemary, cloves, cinnamic acid and carvacol.
- Potassium lactate.
- Sodium diacetate
- Use of starter cultures in lieu of salt for fermented sausage

❖**Note: Before using an additive or preservatives for food preservation or safety, check with your regulatory authority. Certain requirements and restrictions may apply.**

RTE Fruits and Vegetables
The FDA Food Code recommends:

- Raw fruits and vegetables should be thoroughly washed in water to remove soil and other contaminants before being cut, combined with other ingredients, cooked, served or offered for human consumption in a ready-to-eat form.

❖ **Note: The FDA guidance for washing fruits and vegetables for further use does not apply to raw fruits and vegetables that are intended to be washed by consumers before consumption.**

Although not required, retail establishments can use additional intervention steps such as chemical treatment of wash-water to increase the effectiveness of cleaning raw fruits and vegetables. See the sidebar for chemical treatment of fruit and vegetables. Only certain approved chemicals are permitted to assist in the washing process, and must be followed by a potable water rinse. Check with your regulatory authority to determine which treatments or chemicals can be used and in what concentrations.

Chemical Treatment for Fruit and Vegetables

Misuse of chemicals or additives might injure employees or, if they contaminate food, create a potential risk to consumers. The following GRPs should be followed if chemical intervention is used:

- **For chemical additives and treatments – monitor and measure concentration levels with appropriate test kits to ensure safe concentrations are used.**
- **Follow manufacturer's instructions on the product label when using any chemicals to avoid injury to employees, prevent potential risk to consumers from chemical residue and ensure regulatory compliance.**
- **When washing fruits and vegetables with chemicals, always follow the treatment with a potable water rinse.**
- **Monitoring may include checking for appropriate pH levels and chemical concentration of rinse solutions. Identify and immediately correct any problems.**
- **Clean and sanitize all food-contact surfaces, equipment and utensils used for intervention application.**
- **All washed and rinsed fruits and vegetables should be allowed to drain and dry.**

The FDA allows the use of approved chemicals for washing fruits and vegetables but only if followed by a potable water rinse. The chemical formulations allowed and the recommended procedure can be found in the Code of Federal Regulations (21 CFR 173.15 Washing of Fruits and Vegetables with Chemicals), or check with your regulatory authority.

Approved Sources

Retailers should purchase food only from approved sources that fully comply with the law and are under regulatory control. Retailers might want to work with their suppliers to establish purchase specifications and consider obtaining Letters of Guarantee. See the sidebar on Letters of Guarantee. Some manufacturers use processes or additives intended to control *Lm*. Retailers may offer these products to further reduce risk. Discuss with suppliers if inhibitors are used or if products are formulated specifically to control *Lm*.

Letters of Guarantee
Retailers can request suppliers to provide Letters of Guarantee for any product specifications they choose. These letters can be limited to a specific shipment, type of food or supplier. They can also be general and continuing, in which case it is understood that the guarantee applies to all similar shipments or deliveries of the food product.

Retailers should consider evaluating the food safety programs and systems of their suppliers. Some methods for evaluating suppliers include:

- Choose suppliers that participate in recognized food safety certification programs such as the FMI Safe Quality Food (SQF) certification program.
- Conduct assessments of suppliers using in-house auditors or internal buyers.
- Rely on audits conducted by outside third parties.

RTE Meat and Poultry Products from Suppliers

As of June 2003, processors producing certain ready-to-eat (RTE) meat and poultry products are required to take additional steps to further reduce the incidence of *Lm*. Suppliers of RTE meat and poultry products have made significant improvements to reduce the risk of listeriosis by adding antimicrobial ingredients to their product formulations to inhibit *Lm* growth and installing post-processing treatment steps to eliminate the pathogen.

As an added precaution, many suppliers test their products for *Lm* before sending them to retailers.

❖ **Retailers should verify that products tested for *Lm* are held and not shipped or sold to consumers until the test results indicate they are not contaminated with *Lm*.**

This action will further protect consumers and lessen the chances of a product recall.

Receiving

For all food products, the following are recommended procedures:

❖ **Visually monitor incoming products.**

- Inspect the transport vehicle. It should be clean and in good repair.
- Ensure that there is no cross-contamination between raw and RTE products on the vehicle.
- Ensure product integrity and that the packaging is not damaged.
- Verify that the incoming load is from an approved supplier.
- Ensure that incoming products meet purchase specifications.
- Check for off odors, slimy texture or other abnormal characteristics that indicate the product might have been temperature abused.
- Ensure shelf life dates meet retailer's specifications.

❖ **Check the temperature of perishable and potentially hazardous foods (PHF/TCS) upon receipt.**

- Ensure that all product temperatures meet specifications.
- Thermometers should be checked routinely to verify accuracy and calibrated as needed.

❖ **Receive all perishables and potentially hazardous foods (PHF/TCS) at a product temperature of 41°F (5°C) or less.**

- Receive frozen product hard frozen with no evidence of thawing.
- Potentially hazardous food products should be moved promptly into the appropriate refrigerator or freezer storage area to maintain product temperature at 41°F (5°C) or less.
- Maintain an inventory rotation system.

❖ **Special attention should be given to inspecting products from new suppliers.**

❖ **Have a plan in place to reject and handle deliveries that do not meet proper temperatures.**

❖ **Corrective Action – Any products that do not meet the above conditions should be reported to management according to company policy.**

Storage

Lm can grow at refrigeration temperatures. Therefore, three important factors for controlling *Lm* during storage are:

- Temperature
- Time (length of storage)
- Prevention of cross contamination

Storage Controls

❖ **During storage maintain all potentially hazardous RTE foods at a product temperature of 41°F (5°C) or less.**

❖ **Monitor the temperature of RTE foods during storage.**

- Coolers and refrigerated storage rooms should be monitored and maintained to ensure proper temperature. To maintain the required food product temperature, the unit might have to be set to a temperature less than 41°F (5°C).
- Refrigeration equipment should be equipped with a calibrated thermometer that is easily accessible for viewing and placed in the warmest location in the unit. The use of temperature-recording devices and alarm systems is encouraged.
- Maintain an inventory rotation system. Commonly used is the First-In-First-Out or FIFO system. See sidebar for an explanation of FIFO.
- Establish controls for complete separation of raw, cooked and RTE foods throughout all areas of storage and handling. If storage space is limited making it necessary to store different products in the same area of a refrigerator, store raw foods below RTE products.
- Maintain the integrity of the food package during storage to prevent contamination.
- Maintain package identity during the storage period to facilitate product traceability and recovery, if needed.
- Store materials at least six inches above the floor and avoid splashing when cleaning.
- Do not store food product below dripping or leaking condensate.
- Store packaging, wrapping and labeling material so that it does not become contaminated.
- Pallets, boxes, shipping containers or other items from outside the facility should not be brought into RTE handling areas of the store.

FIFO System of Rotation
The First-In-First-Out or FIFO system of rotating store products is one of the most common methods that retailers use to control inventory. FIFO is defined as the rotation of stored items (food, packaging materials, ingredients, single-serve items, etc.) so that the oldest items are used first. Rotation should be done in accordance with the manufacturer's expiration or use-by dates.

Preparation and Handling

Preparation can include various activities such as washing, dicing, chopping, slicing, pre-chilling, cooking, cooling and mixing. These activities often require direct product contact and might involve multiple steps or stages.

- Temperature
- Time (length of storage)
- Prevention of cross contamination

Controls in the Preparation Area

❖ **Raw foods should be separated from RTE foods throughout the preparation and handling areas.**

❖ **Monitor the temperature of RTE foods during storage.**

- Minimize traffic flow (people and equipment) between areas involving raw and finished RTE foods to prevent cross-contamination.
- Prepare RTE foods first, followed by raw foods.
- During food preparation, ensure that utensils and other equipment are cleaned and sanitized prior to initial use and throughout the day as necessary. See Cleaning and Sanitation section for further guidance.
- Do not use the same equipment and utensils for RTE products that have been used for raw products without completely cleaning and sanitizing before use. Color-coded equipment and utensils might help ensure separation and avoid cross-contamination.
- Following the preparation of RTE foods, completely break down, wash, rinse, sanitize and air-dry equipment and utensils.

Temperature Controls

❖ **Maintain appropriate food temperatures during the preparation and handling steps to ensure the safety of the food.**

- During preparation activities, work with only small batches and, as a general guide, do not keep refrigerated foods at room temperature for more than 30 minutes.
- Consider using digital thermometers or thermocouples because they are tip sensitive, efficient, accurate, and respond quickly.

- Cook all raw foods, especially those of animal origin, to the required temperature and time:
  - Beef roast (rare) : 130°F (54°C) for 112 minutes or 140°F (60°C) for 12 minutes.
  - Beef roast (medium): 145°F (63°C) for 4 minutes.
  - Beef, pork or fish: 145°F (63°C) for 15 seconds.
  - Ground beef, pork, and game animals: 155°F (68°C) for 15 seconds.
  - All poultry and stuffed meats: 165°F (74°C) for 15 seconds.
- Cooked PHF/TCS should be cooled immediately in the following manner:
  - From 135°F to 70°F (57°C to 21°C) within 2 hours or less, and to 41°F (5°C) within a total of 6 hours or less.
- Cool foods quickly by leaving a portion of the lid open for heat to escape and use shallow containers whenever possible.
  - From 135°F to 70°F (57°C to 21°C) within 2 hours or less, and to 41°F (5°C) within a total of 6 hours or less.
- Frozen foods may be safely thawed using one of the following procedures:
  - Under refrigeration, provided the food remains at a temperature of 41°F (5°C) or less.
  - Wrapped in sealed, water-tight package and submerged completely under running water at a temperature of 70°F (21°C) or less for a period that does not allow the product to rise above 41°F (5°C).
  - In a microwave oven, if the product is immediately transferred to conventional cooking equipment for cooking with no interruption.

In-Store Packaging and Labeling

❖ **Check with your state or local regulatory agency for your specific requirements on date marking.**

- FDA guidelines recommend that certain foods be date-marked with a shelf life of 7 days or less once opened and if stored at 41°F (5°C) for more than 24 hours. This includes foods that are designated as potentially hazardous foods (PHF) or foods needing temperature control for safety (TCS).

- Consider providing information to customers about home storage temperatures and shelf life. See Appendix A for suggestions and resources for consumer information.
- Minimize the time that potentially hazardous RTE foods are at room temperature. As a general guide, do not keep refrigerated foods at room temperature for more than 30 minutes.
- Use only clean and properly protected packaging materials, such as trays and wrapping film.
- Consider using a sell-by or use-by date for controlling shelf life. Additional information can be included on the label, such as a "keep refrigerated" statement.

❖ **Note: As a reminder, on January 1, 2006 FDA requirements for allergen labeling went into effect. Most packaged foods are required to have food ingredient statements identifying, in easy-to-understand language, the presence of any of the eight major food allergens (milk, egg, fish, Crustacean shellfish, tree nuts, peanuts, wheat, and soybeans).**

Display

RTE foods may be displayed in bulk or as packaged items, and offered to consumers at a full service counter or in a self-service case. They may also be moved to other areas in the store and used as an ingredient in another food or meal. Temperature and time controls, along with the prevention of cross-contamination, are important factors in minimizing *Lm* risks when RTE foods are displayed.

Temperature Controls

❖ **Display all ready-to-eat PHF/TCS foods at a product temperature of 41°F (5°C) or less.**

- To maintain the required food product temperature, the unit might have to be set to a temperature less than 41°F (5°C).

❖ **Monitor display case temperatures to ensure products are maintained at 41°F (5°C) or less. Take immediate corrective action when display cases exceed these requirements.**

- Refrigerated display equipment should have a permanent, visible, non-glass, calibrated thermometer or other temperature-measuring device that accurately measures the case temperature.

- Case thermometers might not always reflect the temperature throughout the entire unit. Therefore, on a regular basis, check other parts of the case, especially the warmest locations and, when practical, monitor the temperature of the food itself.
- Do not load display cases beyond the designated display load line.
- Keep the service case doors closed when not in use to aid in temperature control and minimize fluctuations in temperature.
- Display case vents should be free of any obstructions to ensure proper air flow.

Time Controls

- Implement a system to limit the cold storage time of foods that support the growth *Lm*.
- Implement a system to ensure a complete break in the cycle of commingling RTE foods that are held at 41°F (5°C) or less. The cycle of refilling, adding to or commingling products should be 7 days or less. Consider starting a new cycle for each lot code of product.
- FDA guidelines recommend that foods requiring time/ temperature control for safety be date marked with a storage time of 7 days or less once opened or prepared in a retail food establishment when stored at 41°F (5°C) or less for more than 24 hours. Check with your state or local regulatory authority for specific requirements on date-marking.
- Consider using the practice known as *Time as a Public Health Control* for certain RTE products such as sandwiches. See sidebar for more information on this practice.

Time as a Public Health Control

The FDA *Food Code* describes how to use Time as a Public Health Control. Using this practice, an RTE food can be displayed out of temperature control (such as putting the food out at room temperature) for a period of up to 4 hours. Check with your regulatory authority before using this control measure because additional requirements may have to be met. For example:

- The food item is intended for immediate consumption.
- Written procedures for using Time as a Public Health Control must be available for regulatory authority review upon request.
- The food item is marked with the time that the product is removed from temperature control.
- The food is served, sold or discarded within 4 hours from the time of removal from temperature control.

Prevent Cross-Contamination

❖ **Prevent cross-contamination by completely separating RTE foods from raw products within the display case.**

- Garnishes may be a source of cross-contamination. To reduce this risk, fresh garnishes should be thoroughly washed and replaced regularly. Plastic garnishes should be cleaned and sanitized between use.
- Do not store food products below dripping or leaking condensate.

Cleaning and Sanitation

Procedures should be established for all cleaning and sanitizing tasks. It is recommended that these procedures be written so that they are available to all employees responsible for performing, monitoring and verifying cleaning and sanitizing procedures. The written procedures should include:

- Names and types of chemicals to be used.
- Specific information on how to mix chemicals and test for strength.
- Instructions on how to perform the task.
- Tools needed for the task.
- Frequency of cleaning and sanitizing.

Develop a system for monitoring and verifying that the cleaning and sanitizing tasks are performed correctly.

Areas of Concern and Cleaning Frequency

Some places in the retail food establishment are more likely to harbor *Listeria*, and special attention should be given to these areas.

Area or Item of Concern	Recommended Cleaning Frequency
RTE food-contact equipment and utensils when in general use at room temperature	4 hours
RTE food-contact equipment and utensils such as deli bowls, deli meat trays and platters when in general use under refrigeration a 41°F (5°C)	Daily
Deli slicer and other food-contact surfaces in continuous use at room temperature	4 hours
Cleaning tools for food-contact surfaces such as towels	Daily
Display and service cases	Weekly
Tags and signs inside the display case that can contact exposed RTE products	Daily
Non-disposable gloves such as cleaning and safety gloves	4 hours
Exposed floor drain covers and drain baskets in food preparation areas	Daily
Floors in food preparation areas	Daily

Some equipment and utensils present challenges for cleaning and sanitizing because of their design, location or intended use. Areas and items that are difficult to clean and sanitize can harbor *Lm* and therefore should be given special attention when cleaning and sanitizing.

The list of items below can be used to develop a cleaning schedule and to help monitor and verify cleaning and sanitizing activities. Examples include:

❖ **Food-contact equipment and surfaces**

- Deli slicers, especially the blade covers and safety guards.
- Knives, especially at the juncture between the handle and blade.
- Food containers such as bowls, platters and trays.
- Cutting boards and tables.
- Non-disposable gloves.
- Wet areas such as around food preparation sinks.
- Unsealed joints in food preparation areas such as riveted information tags or plates on slicers.
- Ice machine interior surfaces.

❖ **Other equipment**

- Packaging and labeling equipment.
- Refrigerated display cases and holding units, especially door tracks, drains, condensate drip pans and seals.
- Seams and seals around coolers, freezers and refrigerator doors.
- Refrigerated display case coils and display risers.
- Push carts and U-boats, especially the wheels.
- Motor housings on food processing equipment.
- Catch pans.
- Hand contact surfaces such as on-off switches, knobs, handles, phones and intercoms.
- Air filters, blowers, vents and fans.
- Scales.
- Ice machines including connections and drains.
- Misters.
- Pallets.

❖ **Floors and drains**

- Exposed floor drain covers and drain baskets in food preparation areas.
- Floors in food preparation areas.
- Wet floors and standing water.

❖ **Cleaning and maintenance tools**

- Cleaning tools for food-contact surfaces such as brushes and cloths.
- Hoses and nozzles.
- Brooms, mop buckets and mop heads.
- Ladders used in food processing areas.

Cleaning and Sanitizing Procedures

Completely dismantle equipment to ensure that all surfaces are cleaned, sanitized and dried. *Lm* can hide in areas that retain moisture under cool conditions or where there are cracks and crevices, such as hollow areas, gaskets, exposed insulation, refrigeration units and freezers.

Remember these cleaning and sanitizing guidelines:

- Wet cleaning and sanitizing procedures should never be started until all exposed food products are removed from the area. Cover or remove all food packaging supplies if they are out of the original shipping containers.
- Wipe up spills or standing water immediately.
- Floors, drains, walls and ceilings should not be cleaned during food-handling and packaging operations.
- Always use foaming or low-pressure hoses for cleaning and sanitizing. High-pressure hoses can splash and generate aerosols, which can spread *Lm* and other pathogens via water droplets.
- Never clean and sanitize portable equipment or utensils on the floor.
- Where possible and practical, avoid mid-shift wet cleanups. If necessary, remove the dirty equipment and utensils to a designated cleaning area, or perform a mid-shift or periodic wipe-down to remove product residue from work areas.
- For sanitizers to be effective, a surface must first be properly cleaned and rinsed.
- Use an appropriate cleaning sequence from top down and then top again.
- Establish procedures for cleaning and sanitizing nonfood-contact surfaces, e.g., floor mats, drains, cleaning tools, push carts or U-boats and other conveyances.
- Since *Listeria* needs water to grow, a clean, dry environment will help control *Lm*.

Chemicals and Cleaning Tools

❖ **Use only sanitizers that have been registered by the Environmental Protection Agency (EPA) for the intended purpose, and follow the instructions on the label.**

- Quaternary ammonia sanitizers (quats) are effective against *Lm* at room temperature, and have a residual effect on surfaces. They are less effective in cold environments such as at refrigerator temperatures.
- Peroxyacetic acid (or peracid acid) is effective against *Lm* and can be useful against biofilms, an invisible buildup of material on surfaces that protects bacteria from some sanitizers.
- In some situations, iodophors and chlorine can also be effectively used on cleaned surfaces; see the manufacturer's recommendations for use of these compounds to control *Lm*.
- Sanitizing with steam or hot water is effective against *Lm*.
- Follow the manufacturer's label instructions for proper mixing and concentration levels of sanitizer.
- Check and verify the sanitizer concentration for each batch mixed, using test strips or kits according to the label instructions.
- All cleaning chemicals should be stored away from food products and primary packaging. Any chemical that is not in its original container must be labeled with the common name of the product.
- Tools used for cleaning floors, trash containers, walls and the outside of equipment should not be used to clean food-contact surfaces. These tools include mops, squeegees, brushes, floor drain brushes, pads and brooms. Consider color-coding or labeling tools for use in designated areas.
- Clean and sanitize all cleaning tools and store them separate from food and food-contact surfaces.

Floor Drains Require Special Attention

Floor drains in coolers and RTE departments provide an ideal growth environment for *Lm*. Since *Lm* can commonly be found in floor drains, a continuous effort must be made to keep drains clean and prevent cross-contamination.

- Floor drains should never be cleaned during food-handling and processing. Protect or remove all food and packaging material in the area to be cleaned.
- Use floor drain brushes that are slightly smaller than the diameter of the drain opening to prevent splashing. Floor drain brushes should be clearly identified for this use only.
- Do not use high-pressure hoses to clean drains or to clear backed-up drains.
- Consider the use of bactericidal drain rings when feasible to provide additional residual sanitation after cleaning.
- Clean and sanitize drain brushes. Store them in an area separate from food and food packaging material.

Facility and Equipment: Design, Maintenance and Repair

In the past, outbreaks of listeriosis have been linked to product contamination that occurred during construction, remodeling or repairs. A construction or work area should be separated from food areas whenever modifying the facility, installing or moving equipment, performing repairs or maintenance on equipment, ventilation or refrigeration units, or conducting non-routine activities in any food storage and handling area. Food should always be protected from contamination whenever maintenance or repair work is being performed.

Separation and Protection of Food

Food can be protected by isolating any construction area with a vapor-proof or dust-proof floor-to-ceiling barrier or wall, removing all food and food equipment from the construction area, using exhaust fans and minimizing cross traffic. Every effort must be made to minimize the possible spread of *Lm* during construction and maintenance.

Pay particular attention to possible *Lm* harborage sites that are exposed during construction, such as water trapped behind walls and under equipment.

Since *Lm* prefers a moist environment, it is important to reduce condensation. To minimize condensation, air temperature and humidity should be controlled. Air movement and ventilation can be used to remove heat and moisture from the air and further reduce condensation.

Equipment and Facility Controls

All new and used equipment brought into preparation areas must be thoroughly cleaned and sanitized after it is installed and before it is used. Used equipment should also be cleaned and sanitized before it is brought into the department and again after it is installed.

Equipment and facility design should take into account possible harborage sites for *Lm*. Follow the FDA/Conference for Food Protection (CFP) Food Establishment Plan Review Guide 2000 whenever facility construction or remodeling is scheduled, or when equipment is added or replaced. This guide is available at the Web site: http://www.cfsan.fda.gov/~dms/prev-toc.html

Prior to construction or repairs, dismantle and remove all equipment and food-contact surfaces possible. After the construction or repairs are completed, disassemble, clean and sanitize all food-contact surfaces. Following any construction or repair in a food preparation or storage area, the environment needs to be thoroughly cleaned, including, as appropriate:

- Equipment and equipment framework
- Floors
- Drains
- Walls, especially cracks that retain moisture
- Ceilings
- Cleaning equipment and tools
- Maintenance tools

Design, Materials and Installation

All food equipment and utensils should meet the design, material and construction recommendations of the FDA Food Code. Equipment and utensils should be easy to clean and sanitize, and designed to facilitate service and repairs. Selecting equipment can be simplified by looking for items that bear a stamp of approval from a recognized third-party certification organization, e.g., NSF International or Underwriters Laboratories (UL). Equipment should only be used for the intended purpose.

Equipment should be installed according to the manufacturer's instructions. Give special attention during installation to ensure that there are no crevices, cracks, rough seams, unsealed joints, pitted or corroded surfaces, hollow areas or other areas where water and food debris can collect.

Personal Health and Hygiene

Employees may introduce *Lm* into the retail environment either as the indirect source of contamination (clothing, shoes, hands and skin) or as the direct source (infected person, asymptomatic carrier). It is suggested that a written employee health and personal hygiene policy be established. Refer to the Food Code for specific requirements regarding employee health and personal hygiene.

❖ **Train employees in personal health and hygienic practices.**

Employee Health

Employees with vomiting, diarrhea, jaundice, sore throat with a fever or diagnosed with a communicable disease must immediately report these symptoms or diagnosis to their supervisor. These employees must not work with exposed food, utensils, equipment, or unwrapped single-service or single-use articles. They must have their supervisor's approval to return to work.

An employee with an open wound, abrasion, boil or lesion containing pus on the hand or wrist must wear an impermeable cover (such as a finger cot) to protect the wound, and the hand/wrist must be covered with a single-use glove.

Hand Washing

❖ **All employees handling food must wash their hands and exposed portions of their arms thoroughly for at least 20 seconds**

Employees must wash their hands as often as necessary to prevent contamination. Following is the proper hand washing procedure:

- Rinse hands under running water at a minimum temperature of 100° F (38°C).
- Apply soap and rub hands together vigorously, paying special attention to cleaning under the fingernails and between the fingers.
- Thoroughly rinse under running warm water.
- Dry hands with disposable paper hand towels or an air dryer.

Hand-washing sinks must be available and properly equipped in all food preparation, food dispensing and warewashing areas.

❖ **Hand-washing facilities should be convenient, easily accessible, have hot and cold running water, hand soap, a paper toweldispenser or a sanitary hand-drying device, a hand-washing sign and a proper waste disposal container.**

Employees should be trained and monitored for proper hand-washing procedures. Hands should be washed frequently and whenever they might have been contaminated, including:

- Before starting work or when first arriving at the work station.
- After breaks.
- After using the restroom.
- After handling trash.
- After handling raw food products and materials.
- After answering the phone, handling money or touching other unclean items.
- After eating, drinking or using tobacco products.
- After coughing, sneezing or using a handkerchief or tissue.
- After touching face, hair, nose or ears.
- After handling soiled equipment.
- Before handling ready-to-eat foods.
- After caring for or handling service animals.
- Anytime you change tasks.

Gloves and hand sanitizers are not a substitute for proper hand-washing.

Hygenic Practices

All employees in contact with exposed food should wear clean outer clothing and effective hair restraints approved by the company. Fingernails should be kept trimmed, filed and maintained so the edges and surfaces are cleanable and not rough. Jewelry on the arms and hands should be limited to a plain ring.

❖ Avoid direct bare hand contact with RTE foods

When handling RTE foods, avoid bare hand contact using the following practices:

- Use single-service or disposable gloves.
- Use disposable tissue or wrappers.
- Use properly cleaned and sanitized utensils, such as tongs, spoons or ladles.
- Replace disposable gloves whenever they become soiled, damaged or contaminated.
- Change gloves whenever changing tasks.
- Integrate hand-washing, gloves and use of utensils as appropriate.

Stand-alone glove policies should not be used as a replacement for proper hand-washing. Disposable gloves should be changed whenever the hand-washing policy says that hands should be washed. All disposable items should be discarded when leaving the work area and replaced with new items upon returning.

Movement of employees into and out of RTE food areas should be limited where possible to prevent the introduction or spread of *Lm*. When entering the RTE food area, employees should take appropriate precautions, such as changing or covering outer clothing and washing hands. items should be discarded when leaving the work area and replaced with new items upon returning.

Verification

Methods for Verifying the Effectiveness of Sanitation Programs

Cleaning and sanitizing are essential components of an *Lm* control program in a retail facility. If equipment, surfaces or utensils are contaminated with *Lm*, they can transfer the organism to RTE food products. *Lm* can also hide throughout the environment in nooks and crannies, called niches, where it is more difficult to clean.

Every retail food store should have an effective cleaning and sanitation program, and a plan for monitoring the program. There are different ways to monitor the effectiveness of sanitation programs, and often a combination of approaches can be used. When determining which method to use, questions to ask are:

- How difficult is the area to clean?
- Are *Lm* harborage sites possible?
- Have there been previous problems with sanitation?

Observation and Monitoring

Visual inspection should be a part of all cleaning and sanitation programs. Properly cleaned equipment should have no visible soil or residue. There are several simple and inexpensive ways to verify compliance with cleaning procedures, such as:

- Observe employees during cleaning and sanitation procedures.
- Visually inspect an area, equipment or utensils; this can be done by management or by internal sanitation experts.
- Review cleaning charts and logs.
- Have outside experts conduct third-party audits.

Third-party audits and internal food safety inspections are useful tools for ensuring compliance with written food sanitation programs. Store managers, company sanitation experts and chemical suppliers can also carry out verification tasks.

In a retail food establishment, the person in charge should ensure that employees are properly trained for the tasks assigned to them, and that they fully understand how to perform and document sanitation procedures. These tasks include:

- Mixing and testing cleaning solutions for proper strength.
- Cleaning equipment, surfaces and utensils according to the prescribed schedule.

- Using the appropriate cleaning tools and procedures.
- Ensuring that equipment and surfaces are cleaned as needed throughout the day.
- Verifying that the sanitation schedule is properly followed.
- Completing forms and checklists according to company policy.

Active Managerial Control

The FDA advocates a system called active managerial control. This term is defined as the purposeful incorporation of specific actions or procedures by management into the operation of their business to attain control over foodborne illness risk factors.

Rapid Tests

Rapid or quick tests for monitoring the effectiveness of cleaning procedures are available for use in retail. These simple kits include a swab that is rubbed on a surface and inserted into a hand-held measuring device. The kits measure the amount of organic matter – food debris, microorganisms, yeasts and mold – on a surface and provide a general indication of cleanliness. Kits are also available for measuring protein residues. These kits can be used to develop a baseline for comparison, observe trends and detect a possible lapse in sanitation. Over time, the test results can be used to determine if sanitation procedures are consistently effective.

Factors to consider regarding the use of rapid test kits:

- Quick tests can provide immediate results.
- To be of most benefit, these tests need to be done on a regular basis over time, so you must be willing to make a commitment to using this method.
- These tests detect the presence of food residue and microorganisms and provide a good indication of the effectiveness of cleaning and sanitizing procedures, but they are not designed to identify specific pathogens.
- Using the rapid test kit does not require special skills, and the results are consistent and reliable regardless of the user.
- The swabs can be used to sample a variety of surfaces.
- Because the results are immediate, corrective action can be taken quickly should a problem be detected.
- The results are useful for tracking trends over time and monitoring compliance with the sanitation program.
- Cost might be a factor, although many of these kits can be purchased in quantity through a reputable vendor, who will also provide training and ongoing service.

Microbiological Testing

Microbiological sampling can also be used to monitoring sanitation. This testing can be generic for bacteria or specific for pathogens such as *Listeria*. Before undertaking microbial testing, several important factors should be considered, such as:

- What will be sampled – specific equipment, contact surfaces, food, other?
- Will the test be for generic bacteria or certain types and which ones?
- When, where and how often will samples be collected?
- Who will collect the samples and where will they be analyzed?
- How will test results be handled?

Total plate counts (TPC) and aerobic plate counts (APC) can be used to assess the general level of bacterial contamination on cleaned surfaces. These tests require a certain level of skill and training, samples must be analyzed in a lab and there is a delay in receiving results. The results from generic microbial sampling cannot be used for immediate corrective action, but they can be used to verify sanitation effectiveness over time.

Testing the environment for *Listeria* species is more specific and can be useful if *Listeria* is suspected or known to be a problem. This testing will detect all types of *Listeria*, including some that are not harmful. However, since all types of *Listeria* require the same conditions for survival and growth, finding any *Listeria* present means that more thorough cleaning and sanitizing are needed.

Listeria testing may also be useful in other situations:

- Investigating a foodborne illness or outbreak.
- Confirming that effective corrective action was taken after a positive finding.
- Following a product recall.

❖ **It should be noted that *Listeria*, and even *Lm*, can sometimes be found at retail because *Listeria* is a common environmental contaminant. When detected, the goal is to remove the organism through rigorous cleaning and sanitation.**

Sampling Protocol

The following recommendations might be helpful when developing a voluntary sampling program.

❖ **Before undertaking microbiological sampling of the environment or food-contact surfaces, have a written protocol in place.**

It is important to note that results from generic tests such as TPC or APC are not an indicator of the presence or absence of pathogens. They can, however, provide useful information on the effectiveness of sanitation programs.

Testing for *Listeria* species will more specifically indicate if the sanitation program is effective against pathogenic *Listeria*. Studies have shown that *Listeria* species will be periodically found in a retail environment, and such findings are an indication that more thorough and targeted sanitation efforts are needed.

One of the most important factors to consider in a microbial testing protocol for *Listeria* is how to handle a positive result. The time delay between sample collection and receiving the test result might mean that the source of the organism, and any potentially contaminated product, are already gone. In some situations, a positive finding of *Listeria* can trigger regulatory action, including additional sampling, condemned product and/or a recall.

A *Listeria* testing protocol should include:

- Places to be sampled.
- Number of samples to be collected.
- Frequency of sampling.
- Handling procedures for samples.
- Laboratory testing protocol and reporting mechanism.
- An action plan for how to respond to positive samples, including corrective actions.

Employee Education and Training

Ready to eat foods (RTE) are a part of our lifestyle and culture and account for a large portion of retail food sales. RTE items offer consumers a wide variety of foods that require little or no preparation. However, for some people, eating RTE foods might present a greater risk of getting a foodborne illness. For the illness listeriosis, people at higher risk include the very young, the elderly, pregnant women and those with compromised immune systems such as people with HIV-AIDS.

Retail food employees who handle RTE foods, especially potentially hazardous foods (PHF/TCS) should understand the risks associated with certain foods and the safe handling practices that will minimize the risk of foodborne illness.

All retailers should have a training program that teaches employees safe food- handling practices. Food safety training and education should be a part of the management program. Education programs should support long-term behavioral changes and focus on understanding and applying good retail practices.

In some jurisdictions, food safety training and/or certification are required. You should be aware of the regulatory requirements in all locations where you operate food stores. It is advisable to retrain employees on a recurring basis to ensure awareness of and compliance with the most current food safety practices and recommendations.

Food Marketing Institute offers a complete training package specifically designed by retailers for retailers. SuperSafeMark® includes training materials for all store associates from basic food safety information to certification training for managers. For more information on SuperSafeMark® training, go to www.supersafemark.com.

super mark SAFE

Standard Operating Procedure (SOP) Examples

The foundation of any food safety program is identifying and controlling basic environmental and operating conditions necessary for the safe handling, preparation, storage and sale of food. Each store should establish its own specific Standard Operating Procedures (SOPs) that prescribe step-by-step practices for routine tasks.

SOPs provide a written reference that can be used to evaluate the food safety system, train food employees who are responsible for each task and serve as a reminder of essential procedures. The sample SOPs on the next several pages are intended to provide examples of daily tasks, focusing on specific controls for *Listeria*. It is important that each facility develop SOPs specific to its operation and environment.

Remember – keep SOPs simple and readily accessible to all department employees.

At a minimum, each SOP should contain:

- Title of the task to be completed.
- Date the SOP was developed.
- Area or department where it is to be used.
- Detailed, specific actions that need to be taken to complete the task.
- Any documentation that needs to be completed to verify the task was performed.
- Recommended corrective actions.
- Approval signatures.

❖ **Note: These SOP examples do not represent standards or regulatory requirements.**

Receiving SOP

Background Notes **Date Effective: 1/15/2006**

- This SOP outlines the procedures for unloading and receiving perishable food products.
- Shipments not meeting this SOP should be rejected unless approved by store management.

Department: Receiving

Verification:

- Confirm that the shipment is received from an approved or known supplier.
- Confirm that containers are properly labeled with appropriate product name, supplier information, shelf-life or other date information, and country of origin if required.

Evaluate Product Condition and Unloading

❖**Receive all raw and ready-to-eat PHF at a product temperature of 41°F (5°C) or less.**

- Ensure proper receiving temperatures by taking random product temperatures from each truck.
- Frozen foods should be received hard frozen with no evidence of thawing.
- Whole and all other fresh fruits and vegetables should be refrigerated.
- For full-load deliveries, evaluate the product temperature throughout the delivered load (front, middle and end of trailer). Check product temperature against product purchasing specifications.
- Evaluate the delivery truck for cleanliness; look for evidence of pest infestation or contamination.
- Check product labels for specific requirements such as shellfish tags.
- Check for torn or damaged cases.
- Check for off-odors, slimy texture or characteristics that indicate temperature abuse.
- Look for other evidence of temperature abuse (wet cases, ice on cases, etc).

Action Steps

- Mark product or invoice with the date of receipt and initial.
- Move product rapidly into refrigerated storage. No product should remain on the loading dock out of refrigeration for more than 30 minutes after receipt.

Monitoring – Every Delivery

- Receiving personnel should visually inspect for cross-contamination and temperature abuse. Notify department manager of non-acceptable products to determine disposition.
- Check the food temperature throughout the delivered load (front, middle and end).

Corrective Action

- Do not accept raw or RTE PHF if above 41°F (5°C).
- Do not accept foods showing evidence of freeze or chill damage.
- Do not accept frozen foods with evidence of thawing.
- Do not accept foods from non-approved suppliers.
- Do not accept food showing evidence of spoilage or temperature abuse.
- Do not accept damaged cases or canned goods.

❖**For any of the above, immediately notify department manager.**

Signed _____ Date _____

Refrigerated Storage & Display SOP

Background Notes **Date Effective: 1/15/2006**

This SOP outlines the procedures for refrigerated storage and display in the deli department area.

Department: Deli Department

Specific Instructions:

❖**Store all raw and ready-to-eat PHF at a product temperature of 41°F (5°C) or less.**

- Avoid cross-contamination. Store all raw foods away from RTE foods. Where storage facility does not allow storage separation, place all RTE foods on shelves above raw products. Under no circumstance should raw foods be stored next to or above ready-to-eat products.
- Rotate product using first-in-first-out (FIFO) system or rotate based on dates marked on product using oldest dates first.
- Check product dates during rotation and before use. Any RTE product that is beyond the use-by or sell-by dates should be discarded.
- Discard opened refrigerated PHF after 7 days.
- Store food and packaging materials in a clean, dry location and away from splash, dust or dripping condensate.
- Store food at least six inches off the floor on clean shelves, dollies, racks or pallets.
- Protect packaging materials, such as trays and wrapping materials, from contamination.
- Do not store foods above display case load lines.
- Do not store unwrapped foods directly below misters or foggers.
- Do not place RTE foods directly on ice.

Monitoring

- Check refrigerated food product temperatures three times daily for 41°F (5°C) or below.
- Always check product temperature with a calibrated thermometer. Thermometers should have an accuracy of plus or minus 2°F (1°C).
- Check refrigerator/cooler air temperatures to assure the equipment maintains product temperatures as required.
- Remove any out-of-date, off-color, off-odor, deteriorating, wilting, temperature-abused or otherwise damaged food from storage and display.

Corrective Action

- If raw and RTE PHF temperatures are found to be above 41°F (5°C) when initially measured take two additional temperature measurements.
- If two of the three temperatures are above 41°F (5°C), notify department manager immediately.

Signed _____ Date _____

Cleaning and Sanitizing SOP

Background Notes **Date Effective: 1/15/2006**

This SOP outlines the procedures for proper cleaning and sanitizing in the deli department area. Included are proper cleaning, rinsing and sanitizing steps.

Department: Deli Department

Frequency:

- Check the cleaning schedule for specific cleaning frequencies. Some pieces of equipment require more frequent cleaning.
- Immediately take out of service, clean and sanitize equipment if there is a possibility it has been contaminated.

Mixing Instructions for Sanitizer Solutions

- Follow instructions on the manufacturer's label for solution preparation and use. DO NOT use more sanitizer than called for by the instructions.
- Test the strength of sanitizer solutions after preparation by using special test kits, such as color indicators strips, available from chemical supply stores or from the chemical vendor.

In-Sink Items (Three-Compartment Sink Process)

- Clean and sanitize the three-compartment sink prior to use.
- Identify smaller items such as knives, utensils and cutting boards that can be cleaned in the sink.
- Pre-clean and remove scraps from utensils and equipment.
- Wash dirty or soiled equipment and utensils thoroughly in the first sink in hot (110° F) soapy water. Be sure to remove all visible soil and debris. Wash water needs to be changed frequently.
- Visually inspect equipment and utensils. There should be no visible soil or residue before moving the item to sink #2.
- Rinse cleaned equipment and utensils completely in the middle or second sink in hot, clean water. Rinse water should be changed frequently to avoid carrying over soap, grease or food particles into the sanitizer.
- ❖**Completely immerse cleaned and rinsed equipment and utensils in the last or third sink containing sanitizer solution for at least 30 seconds minimum at the proper temperature or as recommended on the manufacturer's label for sanitizer solution preparation and use.**
- Drain and air-dry. Store cleaned, sanitized items where they will remain protected from contamination.

Work Surfaces (Counters, tables, etc.)

- Remove all food, debris, packaging and processing supplies from the work area.
- Clean and sanitize small pieces of equipment in the three-compartment sink when possible.
- Pre-clean and remove scraps from surfaces.
- Scrub non-movable equipment and items with hot, soapy water using the bucket-and-brush method. Be sure to remove all debris and residue.
- Visually inspect equipment.

- Rinse non-movable equipment completely with warm, clean water.
- Visually inspect equipment.
- ❖**Sanitize by spraying sanitizer or by wiping with clean cloths soaked in a sanitizer solution. DO NOT rinse after sanitizing. Follow instructions on the manufacturer's label for sanitizer solution and air-dry. Position all items so they will drain and dry completely.**
- Store clean cloths in sanitizer solution for use as wiping cloths during the shift.

Large Items and Equipment

- For employee safety, disconnect all electrical equipment from electrical sources before cleaning.
- Remove all food, debris, packaging and processing supplies from the work area.
- Breakdown all equipment for cleaning. Clean and sanitize small pieces of equipment in the three-compartment sink when possible.
- Pre-clean or remove food scraps, residue and debris from equipment. A scraper may be used to accomplish this task.
- Scrub with hot, soapy water using the bucket-and-brush method.
- Pre-rinse the equipment and visually inspect.
- Rinse completely with warm, clean water. Repeat soap and scrub, followed by second rinse.
- Visually inspect equipment. There should be no visible soil or residue.
- Sanitize by spraying or pouring sanitizer solution directly onto the food--contact surfaces. Dip small removable parts in the sanitizer solution in the three-compartment sink. DO NOT rinse after sanitizing. Follow instructions on the manufacturer's label for sanitizer solution preparation and use.
- Air-dry. Position all items so they will drain and dry completely.
- Reassemble at the beginning of the next shift.
- Apply approved food-grade mineral oil as necessary to protect equipment.

Monitoring

Daily:

- Visually inspect cleaned and sanitized equipment prior to use.
- Measure sanitizer concentration before use and throughout the day as needed. Use the appropriate test kit for the sanitizer. Record times when solution is tested and changed on sanitizer log.
- Visually observe equipment and operation for potential cross-contamination.

Corrective Action

- Replace wash and rinse water.
- Rewash dirty equipment and utensils not properly cleaned during first wash/rinse cycle.
- Replace sanitizing solution when test indicates concentrations are not at recommended level

Signed_____ Date _____

Sample Forms

Following are examples of the types of information that a retail store might want to track. These forms are examples of how a retail store could monitor in-store practices and routines.

There are different ways to monitor operations, including:

- Require that the store employee(s) responsible for completing a task fill out the form each time the task is performed.
- Designate a manager to monitor the tasks by observation and record the information.
- Record only deficiencies and corrective actions taken when needed.

Whatever method a store opts to use, the most important thing is to ensure that employees have been trained in preventive control systems, monitoring activities and understanding the procedures. Emphasis should always be placed on monitoring and taking corrective action – whether a store chooses to record such information is optional.

Thermocouple/Thermometer Calibration Log (Example)

Procedure:

1. **Fill a one quart container with ice**
2. **Add cold water to within 2 inches of the top of container**
3. **Stir to allow temperature to equilibrate**
4. **Place control and test thermometer in container with temperature sensing areas touching**
5. **Allow temperature to equilibrate for 3 minutes**
6. **Record temperatures**

THERMOMETER CALIBRATION LOG Criteria Within + or - 2°F of Control Thermometer								
Date	**Time**	**Department or Area**	**Thermometer ID**	**Control Thermometer Reading**	**Personal Thermometer Reading**	**Adjustment Required (yes or no)**	**Initials**	**Comments**
1/15	1:00 PM	Deli	#12	32°F	32°F	No	HK	
1/16	9:00 AM	Deli	# 3	32°F	32°F	No	DJ	
1/16	4:00 PM	Meat	# 6				RR	Broken-discarded

***If a thermometer is broken or taken out of service, document this in the comment column.**

Verified by: _____

Date/Time: _____

DELI DEPARTMENT CLEANING & SANITIZING LOG
Daily-Weekly-Monthly Record
(Example)

STORE #_____ MONTH_____ WEEK BEGINNING_____
DATE

Signature of Department Manager or Person in Charge _____

Equipment & Utensils	Sun	Mon	Tues	Wed	Thur	Fri	Sat
DAILY							
Back Bar Chrome							
Bread Racks							
Carts							
Cutting Gloves							
Desk Area							
Dishwasher							
Floor Mats							
Floors & Drains							
Hot Display Case							
Knife Rack							
Olive Display							
Price Tags							
Rotisserie Front & Glass							
Splash Walls							
Storage Shelves							
Top Of Service Case							
Trash Barrels							
Windows							
Wrapper							
WEEKLY							
Cooler Walls & Racks							
Display Cases (List below):							
#							
#							
MONTHLY							
Cooler Ceiling							

For weekly and monthly items, fill in the date. It can be done on any day of the week.

DELI SLICER SANITIZING LOG (Example)

STORE #_____ MONTH_____ WEEK BEGINNING_____
DATE

Procedure: All slicers must be cleaned and sanitized at least every four hours and as often as needed. The slicer must be thoroughly cleaned and rinsed before using the sanitizer. Use protective gloves and UNPLUG the slicer during all wipe down and cleaning procedures.

DAY	SCHEDULED TIME	ACTUAL TIME	INITIALS
SUN	7:00 AM Start with a clean slicer		
	11:00 AM		
	3:00 PM		
	7:00 PM		
	11:00 PM		
MON	7:00 AM Start with a clean slicer		
	11:00 AM		
	3:00 PM		
	7:00 PM		
	11:00 PM		
TUE	7:00 AM Start with a clean slicer		
	11:00		
	3:00 PM		
	7:00 PM		
	11:00 PM		
WED	7:00 AM Start with a clean slicer		
	11:00 AM		
	3:00 PM		
	7:00 PM		

DAY	SCHEDULED TIME	ACTUAL TIME	INITIALS
THUR	7:00 AM Start with a clean slicer		
	11:00 AM		
	3:00 PM		
	7:00 PM		
	11:00 PM		
FRI	7:00 AM Start with a clean slicer		
	11:00 AM		
	3:00 PM		
	7:00 PM		
	11:00 PM		
SAT	7:00 AM Start with a clean slicer		
	11:00		
	3:00 PM		
	7:00 PM		
	11:00 PM		

Signature of Manager or Person in Charge: _____

SANITIZER TEST LOG (Example)

Procedure: Each new batch of sanitizing solution must be checked with a test kit to ensure proper concentration. Low concentrations will be ineffective; high concentrations will leave a residue. The test must be done with the XYZ test papers supplied by XYZ Company. Follow the instructions printed on the test kit. Allow the solution to cool to 65° –75°F before testing.

Spray bottles must be filled from the dispenser at the sink each day.
Change the solution in the spray bottles as needed to maintain proper concentration.

QUAT: 200 Parts Per Million (PPM); CHLORINE: 100 PPM; IODINE: 25 PPM

Test		From Quat Dispenser at Sanitizing Sink			
DATE	TIME	CHECKED BY (initials)	PPM (reading)	EMPTIED & REFILLED SPRAY BOTTLES (Yes or No)	CORRECTIVE ACTION TAKEN
1/15	7:00 AM	HK	200	Yes	

Signature of Manager or Person in Charge: _____

Appendix A: Consumer Education

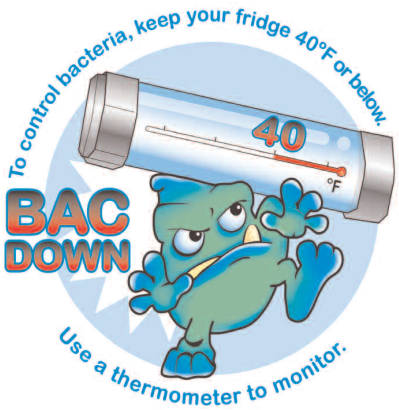
The Food and Drug Administration in collaboration with the U.S. Department of Agriculture and the Centers for Disease Control and Prevention conducted a *Listeria* risk assessment to determine which foods had the greatest potential to cause listeriosis.

This risk assessment model has been used to make predictions on the likely impact a control strategy will have on the number of cases of listeriosis. These predictions, called what-if scenarios, estimate the effect a change can make on the number of illnesses. Several what-if scenarios were included in the risk assessment. One of them – keeping home refrigerators at 41°F (5°C) – by far stood out as a practical, simple and effective strategy for significantly reducing the cases of listeriosis[1].

Refrigerator Temperature Scenario

One of the what-if scenarios predicted the reduction in foodborn listeriosis that could be achieved if consumers maintained home refrigerators at temperatures of 45°F (7°C) or 41°F (5°C). In this example, the predicted number of cases of listeriosis would be reduced approximately 69% (from 2105 to 656 cases) if home refrigerator temperatures were maintained at 45°F (7°C) or less. The predicted number of cases was further reduced to 28 per year – a reduction of greater than 98% – when home refrigerator temperatures did not exceed 41°F (5°C).

No other scenario had as dramatic an effect on listeriosis as this. In response, the retail community has actively participated in a campaign to make consumers aware of this important food safety step. The Partnership for Food Safety Education, working together with the Food Marketing Institute and retail/wholesale companies across the country, have implemented Project Chill-BAC Down, a national initiative to get consumers to lower refrigerator temperatures to 40°F (5°C) and use a thermometer to ensure the proper temperature.



[1]Quantitative Assessment of the Relative Risk to Public Health from Foodborne *Listeria monocytogenes* Among Selected Categories of Ready-to-Eat Foods, September 2003.

Food Marketing Institute offers other useful consumer education materials that retail stores can share with customers. Examples of these include:

- **The Food Keeper**

  The Food Keeper guide provides appropriate storage times for fresh, frozen and pre-packaged foods in your freezer, refrigerator and pantry. It also includes tips on maintaining the freshness and quality of food. As a result, the consumer will be able to handle food products carefully and safely from the store to the table. The Food Keeper was developed in cooperation with Cornell University. This brochure can be downloaded from the FMI Web site at:
  http://www.fmi.org/consumer/foodkeeper/search.htm

- **Consumer Guide to Food Quality and Safe Handling for Deli and Fresh Prepared Foods**

  The Supermarket Deli maintains rigid quality assurance and sanitation standards to ensure that you always receive fresh, wholesome products. Once you purchase the food though, it's up to you to take care of it. This is important, especially for these perishable foods, because a large number of foodborne illnesses are caused by improper handling of foods in the home. This consumer guide can be downloaded from the FMI Web site at: http://www.fmi.org/consumer/foodguides.pdf

Appendix B: Risk Ranking of Foods

In September, 2003 the Food and Drug Administration's Center for Food Safety and Applied Nutrition (FDA/CFSAN) published the results of a risk assessment of *Listeria monocytogenes* carried out in collaboration with the U.S. Department of Agriculture's Food Safety and Inspection Service (USDA/FSIS) and in consultation with the Centers for Disease Control and Prevention (CDC).

The purpose of the assessment was to estimate the relative risks of serious illness and death associated with consumption of different types of ready-to-eat (RTE) foods that may be contaminated with *Listeria monocytogenes* .

The final report is called:

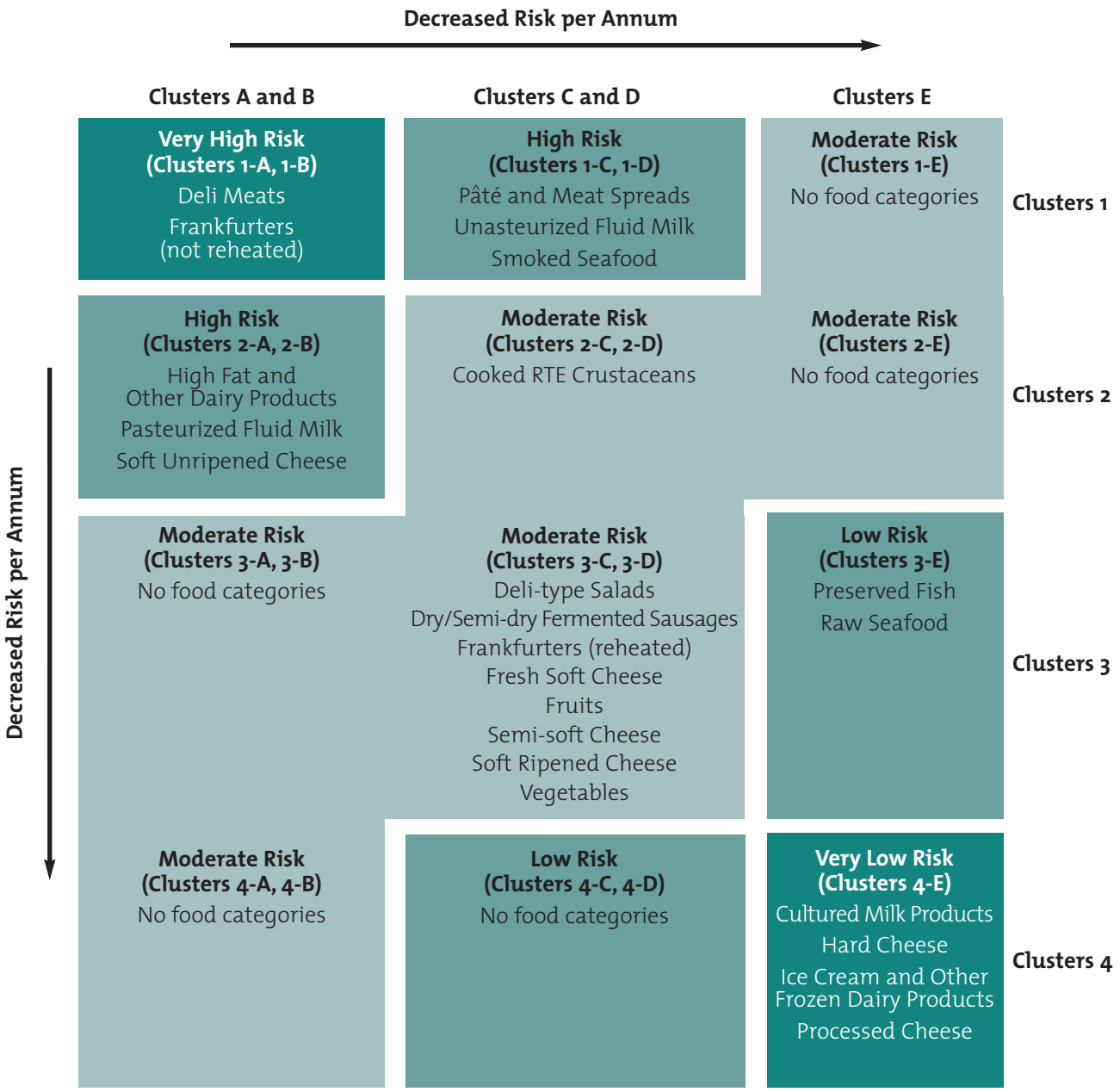
> **Quantitative Assessment of Relative Risk to Public Health from Foodborne *Listeria monocytogenes* Among Selected Categories of Ready-to-Eat Foods**

Within the report is a chart that ranks the relative risk of various RTE foods based on both a per-serving and a per-annum consumption basis. Foods were designated from very high risk to very low risk. A copy of this chart is included in this appendix. Knowing the predicted risk of a food can help target prevention measures for controlling *Listeria monocytogenes*.

Risk Designation Very High. This designation includes two food categories – deli meats and frankfurters (not reheated) – that have high predicted relative risk rankings on both a per serving and per annum basis These foods have the characteristics often associated with the risks for listeriosis – can support the relative rapid growth of Lm under refrigeration, might be stored for extended periods, might be consumed without heating and are consumed frequently.

Risk Designation High. This designation includes six food categories – high fat and other dairy products, pasteurized fluid milk, pâté and meat spreads, soft unripened cheeses, smoked seafood and unpasteurized fluid milk. These food categories have the ability to support the growth of Lm during extended refrigerated storage. However, the foods within this risk designation fall into two distinct groups based on the rate of contamination or the frequency of consumption.

Risk Designation Moderate. This risk designation includes nine food categories – cooked ready-to-eat crustaceans, deli salads, dry/semi-dry fermented sausages, frankfurters-reheated, fresh soft cheese, fruits, semi-soft cheese, soft ripened cheese and vegetables. These foods cover a range of contamination rates and consumption profiles. A number of these foods may include effective Listeria control treatments in their manufacture or preparation (e.g., cooked ready-to-eat crustaceans, frankfurters-reheated, pasteurized semi-soft cheese) or commonly employ conditions or compounds that inhibit the growth of Lm (e.g., deli salads, dry/semi-dry fermented sausages).The risks associated with these products are often associated with product recontamination.


Decreased Risk per Annum
Clusters A and B
Clusters C and D
Clusters E
Very High Risk (Clusters 1-A, 1-B)
Deli Meats
Frankfurters (not reheated)
High Risk (Clusters 1-C, 1-D)
Pâté and Meat Spreads
Unasteurized Fluid Milk
Smoked Seafood
Moderate Risk (Clusters 1-E)
No food categories
Clusters 1
High Risk (Clusters 2-A, 2-B)
High Fat and Other Dairy Products
Pasteurized Fluid Milk
Soft Unripened Cheese
Moderate Risk (Clusters 2-C, 2-D)
Cooked RTE Crustaceans
Moderate Risk (Clusters 2-E)
No food categories
Clusters 2
Decreased Risk per Annum
Moderate Risk (Clusters 3-A, 3-B)
No food categories
Moderate Risk (Clusters 3-C, 3-D)
Deli-type Salads
Dry/Semi-dry Fermented Sausages
Frankfurters (reheated)
Fresh Soft Cheese
Fruits
Semi-soft Cheese
Soft Ripened Cheese
Vegetables
Low Risk (Clusters 3-E)
Preserved Fish
Raw Seafood
Clusters 3
Moderate Risk (Clusters 4-A, 4-B)
No food categories
Low Risk (Clusters 4-C, 4-D)
No food categories
Very Low Risk (Clusters 4-E)
Cultured Milk Products
Hard Cheese
Ice Cream and Other Frozen Dairy Products
Processed Cheese
Clusters 4

APPENDIX C: Good Retail Practices (GRP) Checklist

This checklist provides a quick means for verifying good retail practices (GRP) that help control food safety risks, including *Listeria*.

GRP	In Compliance		Corrected
1. All food products come from an approved source.	Yes ☐	No ☐	☐
2. Check all deliveries for condition and temperature.	Yes ☐	No ☐	☐
3. Immediately store/maintain PHFs at 41°F(5°C) or less.	Yes ☐	No ☐	☐
4. Separate raw and RTE foods at all times.	Yes ☐	No ☐	☐
5. Monitor all refrigerators & display cases for temperature.	Yes ☐	No ☐	☐
6. Employees wash hands before preparing foods and whenever possible hand contamination occurs.	Yes ☐	No ☐	☐
7. Avoid bare hand contact on all RTE foods.	Yes ☐	No ☐	☐
8. Wash all fruits and vegetables thoroughly before use.	Yes ☐	No ☐	☐
9. Cook all foods thoroughly using a thermometer.	Yes ☐	No ☐	☐
10. Clean and sanitize all food equipment and utensils at the recommended frequency.	Yes ☐	No ☐	☐
11. Date-mark PHFs as required.	Yes ☐	No ☐	☐
12. Clean and sanitize floor drains routinely.	Yes ☐	No ☐	☐
13. Protect food during repairs/maintenance/construction; thoroughly clean areas following this work.	Yes ☐	No ☐	☐
14. Monitor SOPs on a regular basis.	Yes ☐	No ☐	☐
15. Conduct food safety education sessions for employees.	Yes ☐	No ☐	☐
16. Monitor and verify food safety program effectiveness.	Yes ☐	No ☐	☐

Appendix D: Listeria Control Key Points

Throughout this guide, key points important to the control of *Lm* risks are highlighted in **red**. Following is a list of key points to consider when evaluating your *Lm* control strategy.

GENERAL :

- **Cool, moist conditions found in a retail facility can create a perfect environment for *Lm* growth.**
- **It should be noted that *Listeria* can sometimes be found at retail because it is a common environmental contaminant. When detected, the goal is to remove the organism through rigorous cleaning and sanitation.**

INCOMING PRODUCTS

- **Visually monitor incoming products for condition.**
- **Check the temperature of perishable and potentially hazardous foods (PHF/TCS) upon receipt.**
- **Receive all perishables and potentially hazardous foods (PHF/TCS) at a product temperature of 41°F (5°C) or less.**
- **Special attention should be given to inspecting products from new suppliers.**
- **Have an Action Plan in place to reject and deal with deliveries that do not meet proper temperatures.**
- **Report any problems with incoming product to management according to company policy.**

FOOD PRODUCT MAINTENANCE

- **During storage, maintain all potentially hazardous RTE foods at a product temperature of 41°F (5°C) or less.**
- **Monitor the temperature of RTE foods during storage.**
- **Raw foods should be separated from RTE foods throughout the preparation and handling areas.**
- **Display all ready-to-eat PHF/TCS foods at a product temperature of 41°F (5°C) or less.**
- **Monitor display case temperatures to ensure products are maintained at 41°F (5°C) or less. Take immediate corrective action if display cases exceed temperature requirements.**
- **Maintain appropriate food temperatures during the preparation and handling steps to ensure the safety of the food.**

DATE MARKING

- **Check with your state or local regulatory agency for your specific requirements on date marking**

SEPARATION OF RAW AND RTE

- **Prevent cross-contamination by completely separating RTE foods from raw products within the display case.**

BARE HANDS AND RTE FOODS

- **Avoid direct bare hand contact with RTE foods.**

CLEANING AND SANITIZING

- **Use only sanitizers that have been registered by the Environmental Protection Agency (EPA) for the intended purpose, and follow the instructions on the label.**

FOOD SAFETY TRAINING

- **Train employees in personal health and hygienic practices.**

HANDWASHING

- **All employees handling food must wash their hands and exposed portions of their arms thoroughly for at least 20 seconds.**
- **Hand-washing facilities should be convenient, easily accessible, have hot and cold running water, hand soap, a paper towel dispenser or a sanitary hand-drying device, a hand-washing sign, and a proper waste disposal container.**

PRODUCT SAMPLING

- **Before undertaking microbiological sampling of the environment or food-contact surfaces, have a written protocol in place.**
- **Retailers should verify that products tested for Lm are held and not shipped to stores or sold to consumers until the test results indicate they are not contaminated with Lm**

Appendix E: Federal Agency Contacts

U.S. Food and Drug Administration, Center of Food Safety and Applied Nutrition, (FDA CFSAN) Retail Food Protection Branch

FDA, HFS-627
5100 Paint Branch Parkway
College Park, MD 20740-3835
(301) 436-2349 FAX (301) 436-2715

U.S. Food and Drug Administration, Regional Field Offices

Northeast (Connecticut, New York, New York City, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont)

158-15 Liberty Avenue HFR-NE16
Jamaica, New York 11433
(718) 662-5621 FAX (718) 662-5434

Central – Mid Atlantic (Delaware, District of Columbia, Kentucky, Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and West Virginia): and Central – Mid West (Illinois, Indiana, Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin):

20 North Michigan Ave., Suite 50
HFR-MW15
Chicago, IL 60602-4811
(312) 596-6523 FAX (312) 886-1682

Southeast (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and Virgin Islands):

60 – 8th Street, N.E. HFR-SE13
Atlanta, GA 30309-3959
(404) 253-1200 ext. 1265 FAX (404) 253-1207

Southwest (Arkansas, Colorado, Iowa, Kansas, Missouri, Nebraska, New Mexico, Oklahoma, Texas, Utah, and Wyoming):

4040 N. Central Expressway, Suite 900 HFR-SW16
Dallas, Texas 75204
(214) 253-4940 FAX (214) 253-4960

Pacific (Alaska, American Samoa, Arizona, California, Guam, Hawaii, Idaho, Guam, Montana, Nevada, Oregon, and Washington):

Office of Regional Director - Pacific Region
Oakland Federal Bldg., HFR-PA16
1301 Clay Street, Suite 1180N
Oakland, CA 94612-5217
(510) 637-3960 ext. 27 FAX (510) 637-3976

U.S. Department of Agriculture, Food Safety and Inspection Services (USDA FSIS)

Office of Federal/State Relations
FSIS-USDA
1400 Independence Avenue
Washington DC 20250
(202) 690-6592

Appendix F: Acknowledgments

The Food Marketing Institute would like to thank the following persons for their assistance in the development of this *Guidance for the Control of Listeria monocytogenes Risks in Retail Food Stores*.

Members of the FMI Food Protection Committee, including those who served on the *Lm* Subcommittee (denoted by an asterisk*) are listed on the following page.

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Conference for Food Protection
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