



RTE Sanitation

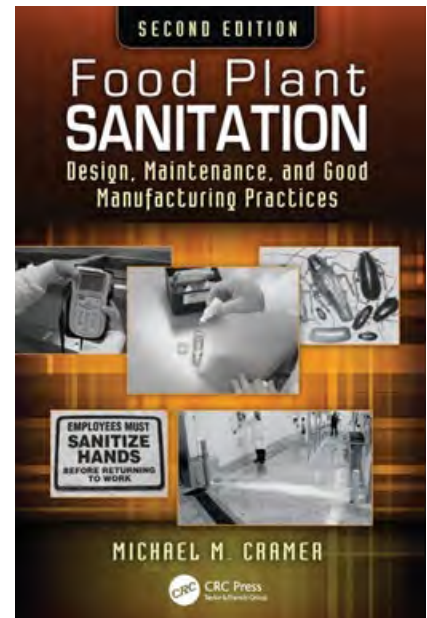
RTE Sanitation

Identify why establishments producing RTE products have a special responsibility for adequate sanitation in the RTE processing environment.

Describe effective methods of sanitation in RTE processing environments.

Identify potential sanitation issues in RTE processing environments.

Define key terminology related to sanitation



Sanitation Concerns in RTE Processing Environments

Terminology



Terminology

Lethality Treatment

A process, including the application of an antimicrobial agent, which eliminates or reduces the number of pathogenic microorganisms on or in a product throughout the shelf life of the product.

Terminology

Post-Lethality Exposure involves the handling of RTE product that comes into direct contact with a food contact surface *after* it has been subjected to an initial lethality treatment.

Terminology

Cross-contamination is the transfer of bacteria to exposed RTE product after the lethality treatment.

Terminology

Listeria monocytogenes (Lm) is of particular concern because it has potentially fatal consequences. Listeriosis can lead to septicemia, meningitis, and spontaneous abortion. It is especially pathogenic to high-risk populations, including pregnant women, newborns, elderly, and people with weakened immune systems.

Note: This includes people who are taking antibiotics – potentially a very large segment of the population at any given time.

Listeria monocytogenes

This microorganism can:

- ▶ Spread by direct food contact with contaminated surfaces
- ▶ Grows in cool, damp environments
- ▶ Gets nutrients from product debris
- ▶ Can make **biofilms** to protect itself (a biofilm is a thin, slimy film of bacteria that adheres to a surface, effectively protecting it from the environment)

Lm in Finished Products

- Hardy; can survive in packaged refrigerated product
- Resists salt, nitrite, acid
- Illnesses and deaths linked to products adulterated with *Lm*
- Adulteration occurs through cross-contamination from environmental sources after cooking



Terminology

Microorganisms

Some establishments test for organic residues. Other establishments might test for spoilage organisms, for example, yeast and mold, coliform bacteria, or non-pathogenic bacteria. Other establishments might test for indicators of potential pathogens, such as *Listeria* spp.

Terminology

- ▶ **Time** - The amount of time it takes test results to be available also varies from several minutes to several days, depending on the type of method used.

Terminology

Environmental surfaces

These are areas where product does not make contact like walls, ceilings, floors, underneath tables - carts, employee shoes, electrical cables/switches/outlets, etc.



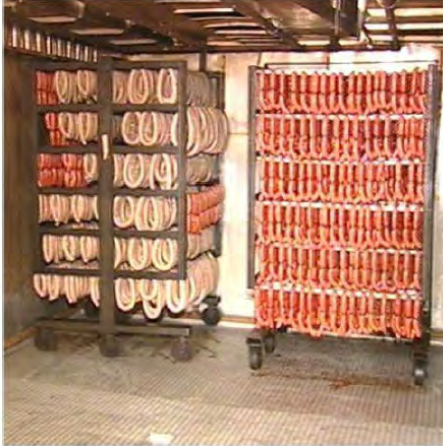
Terminology

Food Contact Surfaces - These are surfaces that have direct contact with product, such as tabletops, hands, gloves, aprons, knives, packaging material/film, conveyor belts, brine (when product is not in a cook-in-the- bag), etc.



Terminology

Product - These are samples of the actual product after it has gone thru the lethality step. The amount and number of samples will depend on the type of product, testing procedure and amount represented.



Terminology

Sanitizing is the application of either heat or chemicals to substantially reduce the numbers of microorganisms to an acceptable level.



Terminology

Cleaning is the removal of product residue from the equipment and environment.



Review Question

***Listeria monocytogenes (Lm)* is the same as *Listeria* species (spp).**

- True
- False

Review Question

***Listeria monocytogenes* can grow in cool, damp environments, such as coolers and floors.**

- True
- False

Review Question

***Listeria monocytogenes* is fragile and cannot grow in refrigerated, packaged, RTE products.**

- True
- False

Review Question

RTE products must be cooked by the consumer before they are eaten.

- True
- False

Review Question

***Listeria monocytogenes* is especially harmful to pregnant women and infants.**

- True
- False

Summary of Key Points

Importance of sanitation in RTE environments Terminology

1. Lethality treatment
2. Post-lethality exposure
3. Cross-contamination
4. *Listeria monocytogenes* (*Lm*)
5. Microorganisms
6. Environmental surface
7. Food contact surface
8. Product
9. Sanitizing
10. Cleaning

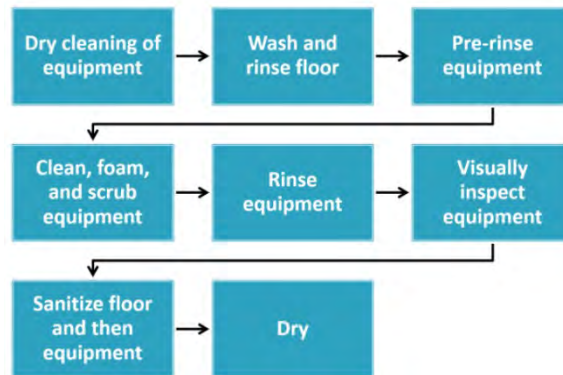
Sanitation Concerns in RTE Processing Environments



Sanitation in RTE Environment

Pre-op Sanitation in the RTE Environment

Typically, effective preoperational sanitation can be summarized in these 8 fundamental steps.



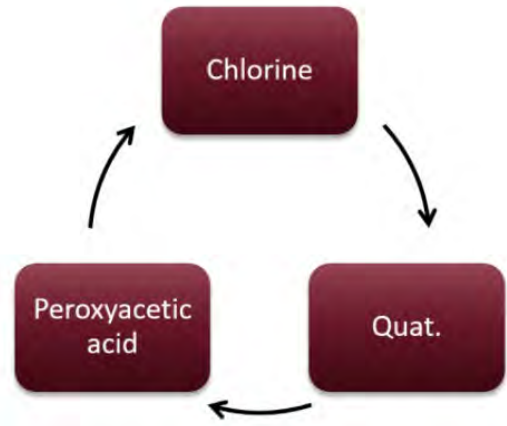
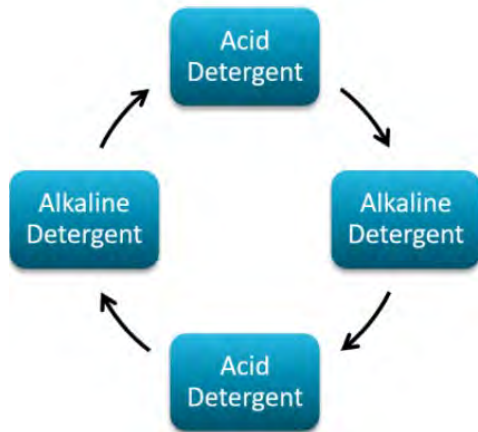
Cleaning vs. Sanitizing

- **Cleaning** – removing soil from equipment and environment
- **Sanitizing** – application of chemicals or heat to reduce microbes



Rotating Detergents & Sanitizers

Helps maintain effectiveness by keeping bacteria "off balance"



Operational Sanitation in RTE Areas

Protecting exposed RTE product after the initial lethality step as it moves throughout the establishment is an important consideration in preventing post-lethality contamination.



Review Question

Sanitation is an essential part of the production of safe RTE products.

- True
- False

Review Question

Periodically rotating sanitizers will provide greater effectiveness against bacteria.

- True
- False

Review Question

***Lm* is very hardy, can survive in refrigerated packaged product.**

- True
- False

Review Question

Establishments must ensure effective sanitation, especially in those areas where RTE products is stored or handled after a lethality treatment has been applied.

- True
- False

Summary of Key Points

- 8 fundamental steps for pre-operational sanitation
- Understand cleaning vs. sanitizing
- Establishments should rotate sanitizers and detergents to keep microbes "off balance"
- Importance of operational sanitation in RTE areas/post-lethality environment



Sanitation Concerns in RTE Processing Environments



Compliance with Sanitation Performance Standards (SPS)

SPS and Environmental Reservoirs for *Lm*

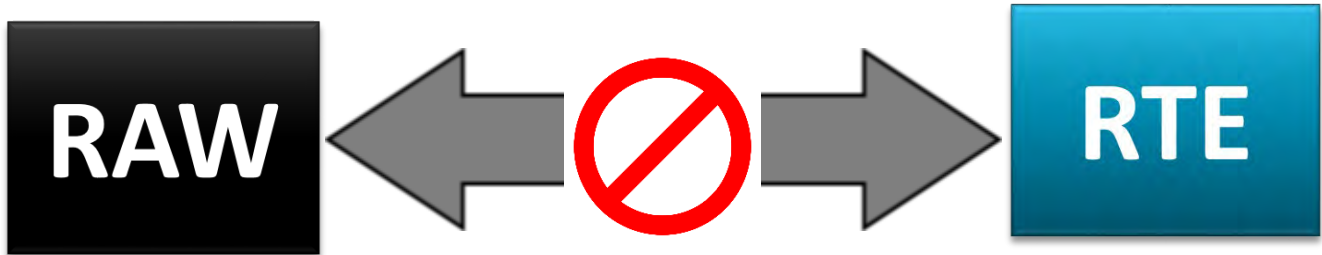
Sanitation Performance Standards (SPS) compliance is important to protect against environmental reservoirs for *Lm*.



Considerations in Establishment Design

Considerations in Establishment Design

- Air flow
- Ventilation
- Layout and traffic flow



Listeria *monocytogenes* + Construction

Lm and Construction

Linked to disruptive construction

Lm is in the environment

Dust/debris generated can carry *Lm* all over the equipment and facilities, if not controlled

Construction generates dust - dust carried by the air currents and/or employees could bring *Lm* and other adulterants to the RTE environment.



Lm and Construction

Dust contaminates food contact and environmental surfaces. Increased sanitation and monitoring is highly recommended.

Lm and Construction

- Disruptive construction:
 - Removal of drains, floors, walls
 - Movement of materials
 - Exposure of areas not typically cleaned
- Establishment is responsible for controlling food safety issues resulting from construction

Review Question

What are some of the considerations an establishment should take in the design of their facilities when thinking about *Lm*?

(Select all that apply.)

- Air flow
- Layout and traffic flow
- Ventilation
- None of the choices.

Review Question

Establishment construction has been linked to contamination with *Listeria monocytogenes*.

- True
- False

Review Question

RTE product which occasionally contacts the wall in the cooler is at risk for contamination with *Listeria monocytogenes*.

- True
- False

Review Question

A locker room shared between RTE product handlers and raw product handlers could be a source of RTE product cross-contamination.

- True

- False

Summary of Key Points

- Relationship between Sanitation Performance Standards (SPS) and potential environmental reservoirs of *Lm*
- Establishment design considerations (air flow, ventilation, layout and traffic flow)
- *Lm* and disruptive construction



Sanitation Concerns in RTE Processing Environments



Assessing Sampling Effectiveness

Assessing Sanitation Effectiveness

- Confirms controls are effective
- Measures effectiveness of sanitation
- Includes:
 - Monitoring implementation of Sanitation SOPs
 - Observation of employee hygiene practices
 - Good recordkeeping
 - Reevaluating and modifying Sanitation SOPs as needed



Establishment Testing Programs

Establishment Testing Programs

- **Purpose** - Some establishments will design their program for the purpose of measuring the effectiveness of the cleaning procedures; other testing programs might be designed to verify that finished product is free of *Lm*, while others test for organic residues, and even others might test for spoilage organisms, for example, yeast and mold, coliform bacteria, or non-pathogenic bacteria or for indicators of potential pathogens, such as *Listeria* spp.

Some establishments are required to test food contact surfaces, depending on their chosen alternative under the *Listeria* Rule.

Types of Testing/Sampling Methods

- **Type of Testing/Sampling method** - There are a wide variety of sampling methods used, and many more are being developed. Some examples are: swabs and sponges used with standard plating methods, prepared plates and other testing kits of various types, and air collection systems. The amount of time it takes test results to be available also varies from several minutes to several days, depending on the type of method used.

Testing for *Lm* vs. *Listeria* spp.

- *Listeria monocytogenes* = pathogen
- *Listeria* species (spp.) = indicator organism

Types of Establishment Testing

- **Environmental surfaces** - These are areas where product does not make direct contact, such as walls, ceilings, floors, undersides of tables or carts, employee shoes, electrical cables/switches/outlets, etc.

Types of Establishment Testing

- **Food contact surfaces** - These are surfaces that have direct contact with product, such as tabletops, hands, gloves, aprons, knives, packaging material/film, conveyor belts, brine (when product is not in a cook-in-the-bag), etc.

Types of Establishment Testing

- **Product** - These are samples of the actual product after it has gone through the lethality step. The amount and number of samples will depend on the type of product, testing procedure and amount represented.

Environmental Surface Testing

- Information about sources
- Extent of pathogen contamination
- Information about equipment design
- Probable cross-contamination sites

Environmental Surface Testing

Positive test - post-lethality processing environment

- Indicates problem may exist
- May have been transferred to product
- Followed up by cleaning and food contact surfaces/product testing

Recordkeeping

- Results may not be available until after production
- Accurate records essential to utilize results
 - Identification of site samples
 - Visible condition of site

Food Contact Surface Testing

Positive test - food contact surface

- *Listeria* spp. – Implies that product may have become contaminated.
- Lm – Product that has come in contact with the surface is adulterated.

Product Testing

Positive test-product, *Lm*

- Product is adulterated
- Evidence that *Lm* may be a food safety hazard reasonably likely to occur



Other Testing Methodologies

Other Testing Methodologies



Total Plate Counts (TPCs)

Other Testing Methodologies

Adenosine Triphosphate (ATP) Bioluminescence swab testing



Relationship Between General Sanitation Measures and HACCP

- Initial lethality step is probably a CCP
- CCP to address prevention of post-process contamination may be needed
- Sanitation issues may be included in HACCP plan



Review Question

An environmental testing program can be a means of confirming that the establishment's controls are effective in maintaining an environment that will minimize the hazard of pathogens.

- True
- False

Review Question

Establishments are responsible for ensuring that their Sanitation SOPs are effective in preventing contamination by *Lm* in the post- lethality processing environment.

- True

- False

Review Question

Environmental testing could include sampling in the post-lethality processing area to discover where *Lm* might be found.

- True
- False

Review Question

An establishment finds *Lm* in finished product through product testing. FSIS would consider this to be evidence that *Lm* contamination may be a food safety hazard reasonably likely to occur.

- True
- False

Review Question

When taking samples for *Listeria monocytogenes* in an establishment, you will take what type of samples?

- Product sample
- Environmental samples
- All of the choices
- Food contact surface samples

Summary of Key Points

Assessing sampling effectiveness

- Confirms effectiveness of controls
- Measures effectiveness of sanitation programs
 1. Monitoring implementation of SSOPs
 2. Observing employee hygiene practices
 3. Importance of good recordkeeping
 4. Reevaluating and modifying SSOPs as needed

Summary of Key Points

Establishment Testing Programs

- Understand the purpose(s) of testing (Slide 6)
- Types of testing
 1. Environmental surfaces (including air samples)
 2. Food contact surfaces
 3. Product

Summary of Key Points

- Methods of testing (sponge, swab, ATP bioluminescence, total plate count)
- Implications of test results (potential contamination vs. adulteration of product)