



Prevent Salmonella in Ready-to-Eat Products

Cover

Food Safety and Inspection Service

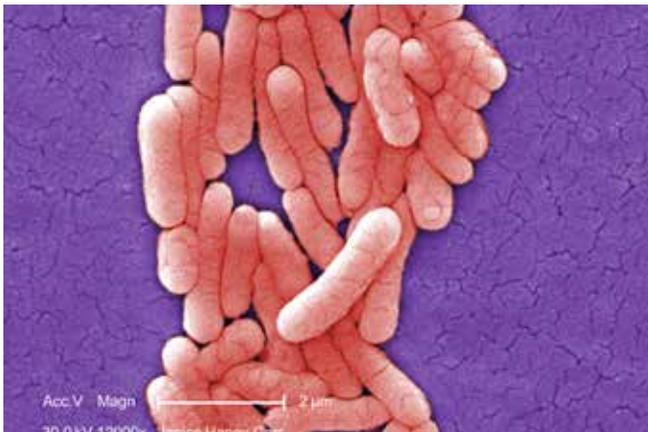
Small Plant News



Volume 7 | Issue No. 1

Prevent Salmonella in Ready-to-Eat Products

By Kristina Barlow, Risk, Innovations, and Management Staff, Office of Policy and Program Development, and Jane Johnson, DVM



Salmonella is a foodborne pathogen that is estimated to cause 1 million cases of foodborne illness in the United States annually. Preventing it is a 24/7 challenge as Salmonella can be anywhere. For instance,

ready-to-eat (RTE) meat and poultry products can be contaminated by under-processing or even the plant environment. Ingredients such as spices, surprisingly, added after the lethality (kill) step may also be a source of contamination.

To meet the requirements of the USDA Food Safety and Inspection Service's (FSIS) zero-tolerance policy for Salmonella, Listeria monocytogenes, and other pathogens in RTE meat and poultry products, you must identify and consider all possible hazards associated with all steps in your production, including the addition of ingredients or untreated sauce after the lethality step. Failure to identify all steps in a process, including contaminated ingredients and sauces, can result in an inadequate food safety system and a potential world of problems.

Continued on Page 2...

Prevent Salmonella in RTE Products

[...Continued from Page 1](#)

By strengthening your Hazard Analysis and Critical Control Point (HACCP) controls for *Salmonella* and validating your process to achieve the necessary level of reduction, you can produce safe products and protect public health.

FSIS has developed the “*Salmonella* Compliance Guidelines for Small and Very Small Meat and Poultry Establishments that Produce Ready-to-Eat (RTE) Products” (FSIS *Salmonella* Guideline). The guideline explains the regulatory requirements associated with the safe production of these products.

The guideline also provides information on achieving lethality and stabilization requirements in RTE products. In addition, you can learn how to avoid cross contamination, maintain employee hygiene, keep records, and develop procedures to ensure that spices and other ingredients are not contaminated during production of the meat product.



The guidelines are based on sound scientific and practical considerations and represent best practice recommendations by the agency. They may be accessed from the FSIS Web site at www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/compliance-guides-index.

By following these basic steps, you are likely to meet regulatory requirements for the design of your food safety system. Additional validation would not be required. However, you would need to provide documentation that you are implementing the guidelines, and that your food safety systems are effective in controlling pathogens.

Salmonella lethality requirements are provided in the regulations for roast beef, uncured meat patties, and poultry products, specifying that:

- Roast, cooked, and corned beef must be processed to achieve at least a 6.5-log reduction of *Salmonella* or an alternative lethality that achieves an equivalent probability that no viable *Salmonella* organisms remain in the finished product per 9 CFR 318.17(a)(1), found at https://edocket.access.gpo.gov/cfr_2004/janqtr/pdf/9cfr318.17.pdf;
- Cooked, uncured meat patties must be processed to achieve a 5-log lethality by meeting or exceeding the time and temperatures listed in 9 CFR 318.23, found at https://edocket.access.gpo.gov/cfr_2004/janqtr/pdf/9cfr318.23.pdf; and
- Cooked poultry products must be processed to achieve at least a 7-log reduction of *Salmonella* per 9 CFR 381.150(a)(1), found at https://edocket.access.gpo.gov/cfr_2004/janqtr/pdf/9cfr381.150.pdf.

[Continued on Page 3...](#)

Prevent Salmonella in RTE Products

...Continued from Page 2

“Log” stands for logarithm. The logarithm of a number is the exponent to which a fixed value known as the base must be raised to produce that number. For example, the logarithm of 100 using log base 10 would be 2, because the base, 10, must be raised to the power of 2 (10^2) to equal 100 ($10^2 = 10 \times 10 = 100$).

When FSIS uses the term “log,” the agency is referring to “log base 10,” written as “log10” or simply “log.” The example above would be expressed as $\log(100) = 2$ or 2 log. 2 log equals 10^2 or 10×10 or 100.

“Log reduction” stands for a 10-fold or one decimal or 90 percent reduction in numbers of recoverable bacteria in a test food vehicle. Another way to look at it is: 1 log reduction would reduce the number of bacteria 90-percent. This means, for example, that 100 bacteria would be reduced to 10 or 10 reduced to 1.

- 1 log reduction = 90-percent reduction
- 2 log reduction = 99-percent reduction
- 3 log reduction = 99.9-percent reduction
- 4 log reduction = 99.99-percent reduction
- 5 log reduction = 99.999-percent reduction
- 6 log reduction = 99.9999-percent reduction

Guidelines for meeting lethality for RTE meat and poultry products requirements can be found in:

- “Appendix A: Guidelines for Meeting Lethality Performance Standards for Certain Meat and Poultry Products,” found at www.fsis.usda.gov/wps/portal/frame-redirect?url=http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/95-033F/95-033F_Appendix_A.htm; and
- “Time-Temperature Tables for Cooking Ready-to-Eat Poultry Products,” found at www.fsis.usda.gov/wps/wcm/connect/9ab2e062-7ac8-49b7-aea1-f070048a113a/RTE_Poultry_Tables.pdf?MOD=AJPERES.

To achieve full lethality in the product, it is important to meet both the time/temperature parameters and humidity according to Appendix A.

Stabilization requirements in the regulations for roast beef, cooked meat patties, and poultry products specify that:

- There can be no multiplication of toxigenic microorganisms such as *Clostridium botulinum*, and no more than 1 log multiplication of *Clostridium perfringens* within the product, in accordance with 9 CFR 318.17(a)(2), 318.23(c)(1), and 381.150(a)(2).

Guidance for achieving stabilization for RTE meat and poultry products can be found in:

- “Appendix B: Compliance Guidelines for Cooling Heat-Treated Meat and Poultry Products (Stabilization),” found at www.fsis.usda.gov/wps/wcm/connect/a3165415-09ef-4b7f-8123-93bea41a7688/95-033F_Appendix_B.pdf?MOD=AJPERES.

Producers of RTE products, other than roast beef, uncured meat patties, and poultry products, should know these time/temperature combinations. Producers must support and document that they are controlling the food safety hazards in their product in accordance with 9 CFR 417.2(a)(1) and 9 CFR 417.5(a)(1). Establishments producing RTE meat and poultry products must achieve lethality of pathogens (e.g., *Salmonella*) in the product and stabilize the product to inhibit the growth of spore-forming bacteria (e.g., *C. botulinum* and *C. perfringens*). The plant needs to be able to support that its product is RTE at the end of the process.

As long as good manufacturing practices are followed, the guidelines recommend the following to demonstrate that the plant has achieved lethality:

- a 5-log lethality of *Salmonella* for meat products, and
- a 7-log lethality of *Salmonella* for poultry products.

Plants can use Appendix A guidelines for their cooking procedures for the products or “FSIS Guidance on Safe Cooking of Non-Intact Meat Chops, Roasts, and Steaks.” They may use “Appendix B: Compliance Guidelines for Cooling Heat-Treated Meat and Poultry Products (Stabilization)” to stabilize their products.

Continued on Page 4...

Prevent Salmonella...

...Continued from Page 3

Other considerations include post-lethality exposed RTE products. Plants producing post-lethality exposed RTE products (products exposed to the environment after the lethality treatment [e.g., cooking] and before packaging) must meet the requirements of 9 CFR Part 430, known as “the *Listeria* Rule.”

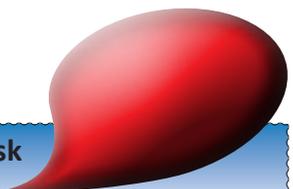
FSIS has provided guidance for meeting the requirements of the *Listeria* Rule in the “FSIS Compliance Guideline: Controlling *Listeria monocytogenes* (Lm) in Post-Lethality Exposed Ready-to-Eat (RTE) Meat and Poultry Products” (FSIS *Listeria* Guideline) found at www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/compliance-guides-index.

Additionally, the FSIS *Salmonella* Guideline provides “lessons learned” from analyzing FSIS Food Safety Assessments (FSA). FSAs are conducted by Enforcement, Investigations, and Analysis Officers (EIAO) to assess the design and validity of food safety systems. Describing the deficiencies found during these assessments can assist you with understanding what to avoid. Some of these “lessons learned” are:

- Do not use the same utensils or containers for handling RTE product that are used for raw product without cleaning and sanitizing between uses for each. Better yet, have separate labeled or colored utensils dedicated to only one step: either raw or RTE.
- If necessary, clean and sanitize all equipment used for processing both raw and cooked product when dedicated sets are not available.
- Ensure the safety and sanitation of uncooked vegetables, herbs, spices, or hydrolyzed vegetable protein (HVP) added after the cooking step.
- Identify and consider all hazards associated with all steps in your hazard analysis, including the addition of ingredients or untreated sauce after the lethality step.
- If you use a process that is designed to achieve a lower level of pathogen reduction in the lethality

Small Plant Editorial Staff

- ▲ Editor in Chief:
Daniel P. Puzo
- ▲ Managing Editor:
Jane Johnson, DVM
- ▲ Production Manager:
Sally Fernandez
- ▲ Creative Director:
Gordon E. Wilson
- ▲ Design:
Duane Robinson
- ▲ Office of Outreach, Employee Education and Training
Assistant Administrator
Michael G. Watts



FSIS Small Plant Help Desk
1-877-374-7435
InfoSource@FSIS.usda.gov

step than recommended in FSIS guidelines, then you should have a validated method for testing the raw ingredients for the presence of *Salmonella* or *E. coli* O157:H7. It is the only way to be certain that the lower level of lethality is sufficient to ensure the safety of the product.

By following FSIS guidelines, you will less likely produce contaminated RTE products. Following the guidelines should prevent contaminated products from reaching consumers and decrease the potential of foodborne illness from RTE meat and poultry products.

If you have any questions or wish to receive hard copies of the compliance guidelines, please call the Small Plant Help Desk at 1-877-FSISHELP (1-877-374-7435) or E-mail InfoSource@fsis.usda.gov. Hours of operation are Monday-Friday from 8:00 a.m. - 4:00 p.m, ET.

Small Plant News, USDA/FSIS, Patriots Plaza III, Rm. 9-267A, Mailstop 3778,
1400 Independence Ave., SW, Washington, DC 20250. (800) 336-3747; E-mail: SmallPlantNews@fsis.usda.gov

USDA is an equal opportunity provider and employer.