Despite relentless efforts to control *Listeria monocytogenes* in food manufacturing plants, this microorganism remains the second most costly foodborne illness after *Salmonella* in the United States (CDC statistics, 1997).

Quality assurance (QA) managers in food facilities face a daunting task of attempting to eradicate this microorganism from the food production environment. However, a report issued by a 28-member Food Safety and Inspection Services (FSIS) (www.fsis.usda.gov) assessment team that measured the effectiveness of an interim final rule addressing *Listeria monocytogenes (LM)* in RTE foods showed the overall safety of these products has improved in response to the rule because establishments have strengthened their control measures and increased testing (USDA/FSIS Congressional and Public Affairs, 2004).

In November 2002, FSIS issued a directive that placed an intensified testing program on plants that produce high and medium risk RTE products that did not have a validated testing regime for LM. Plants that had a validated testing program, but chose not to share its testing data with FSIS on an ongoing basis, were also subject to the intensified testing program. These provisions were also made part of the interim final rule (CDC, 2002).

Under 9 CFR Part 430, the USDA/FSIS requires establishments that produce fully-cooked RTE meat and poultry products that are (1) exposed to the environment after lethality treatments and (2) support the growth of *Listeria monocytogenes*, to have in their Hazard Analysis Critical Control Points (HACCP) plan, sanitation SOPs, or other prerequisite programs, controls that prevent product adulteration by *Listeria monocytogenes.*

The interim final rule, which became effective October 6, 2003, mandates that Ready-to-Eat establishments incorporate one of the following three strategies to control LM:

**Alternative 1:** Employ both a post lethality treatment and a growth inhibitor for *Listeria* on RTE products. Establishments that opt for this alternative will be subject to FSIS verification activity that focuses on the post-lethality treatment effectiveness. Sanitation is important, but is built into the degree of lethality necessary for safety, as delivered by the post-lethality treatment.

**Alternative 2:** Employ either a post lethality treatment or a growth inhibitor for *Listeria* on RTE products. An establishment’s sanitation program for this alternative must provide for the testing of food contact surfaces in the post-lethality environment. These establishments will be subject to more frequent FSIS verification activity than for Alternative 1.*
**Alternative 3:** The establishment does not apply any post-lethality treatment or an antimicrobial agent or process, employing sanitation measures only. The establishment is required to have a sanitation program that includes testing of food contact surfaces. Establishments opting for this alternative will be targeted with the most frequent level of FSIS verification activity. Within this alternative, FSIS will place increased scrutiny on operations that produce hot dogs and deli meats.*

Because *Listeria*, like all foodborne pathogens, is easily killed by thermal treatment, it is the post-processing environment that attracts the highest level of attention by sanitation managers, quality assurance professionals, and regulatory officials.

The primary initiative taken by food safety professionals to control or eliminate *Listeria spp* from RTE foods focuses on determining the likelihood that the microorganism exists in the post-processing environment. Post-processing areas include: transition areas between production and cooking areas; finished product staging areas; and, the packaging departments in food manufacturing facilities that produce RTE foods.

The key reason why *Listeria* presents such a problem for many food manufacturers is that, in general, food-processing conditions are conducive to the growth of *Listeria*. For example, *Listeria monocytogenes* favors the exact conditions of a meat processing plant, i.e., wet floors, cool and damp walls, standing water in rough floor surfaces, moist floor drains, etc. *Listeria* actually grows best in refrigerated conditions.

An effective environmental sampling plan, along with HACCP and its pre-requisite plans, is the best way to ensure that organization is doing all that it can to control this potentially lethal pathogen.

To locate possible sources for *Listeria* and other pathogens, a thorough assessment of the food manufacturing plant must be made. A comprehensive sampling plan must be developed and should include sampling in four zones within the production environment. The zone sampling concept is outlined below:

◊ **Zone 1:** Product contact surfaces such as belts, conveyors and overhead areas.
◊ **Zone 2:** Equipment and other surfaces close to the direct contact areas.
◊ **Zone 3:** Surfaces not in direct contact with food (floors, walls, and ceilings).
◊ **Zone 4:** Areas distant from production areas (restrooms, loading docks, etc.).

Sterile sponges for floor drains and cooler walls and/or sterile swabs often used in sampling food contact surfaces are the most common way to get a good picture of the microbial ecology of the food processing environment. If swabbing Zone 1, i.e., food
contact surfaces, a corrective action plan that includes a “hold and release” program should be in place in the event of a positive test result.

*Source: F.R. Vol. 68, 34208, 34225

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