

Listeria and Ready-to-Eat Meat Products

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Listeria monocytogenes is a challenge for companies making ready-to-eat (RTE) meat products because it is different from most other pathogens that processors deal with when making RTE products. First, *Listeria* is cold tolerant and can slowly grow in a vacuum package at refrigerated temperatures. Although *Listeria* has been shown to be more heat tolerant than *Salmonella* (basis for Appendix A), survival of *Listeria* during cooking is rarely a problem with RTE products. *Listeria* poses a greater hazard when cooked products are exposed (e.g., casings removed) to the environment during the packaging process. *Listeria* is commonly found in the environment and if an RTE product is contaminated with *Listeria* during packaging, even slow growth at refrigerated temperatures can result in a problem when refrigerated vacuum packaged products are held for long time periods before being purchased and consumed.

Even with all of that we have learned about facility and equipment design, cleaning and sanitizing methods and antimicrobial ingredients, *Listeria* will continue to be introduced into the RTE packaging environment.

If you haven't addressed the *Listeria* hazard in the post-lethality step (e.g., packaging) of your HACCP plan, regulators are likely to ask you to address it. "Addressing" a hazard doesn't mean that you have to have a CCP at that step, but that you have done the hazard analysis for that step to determine if a hazard is reasonably likely to occur.

And if you were leaning toward having a CCP at this step, what critical limits would make sense to control the *Listeria* hazard? Product or room temperatures are often suggested, however, since *Listeria* is so cold tolerant, I doubt that controlling temperatures would have much effect on preventing *Listeria* growth. Plus, the bigger issue is the presence of *Listeria* where the packaging is occurring. Some have suggested monitoring the concentration and application of sanitizers, but couldn't that be just as effecting as a good manufacturing practice (GMP)?

A *Listeria* control program is the best way to "prevent, reduce, and eliminate" *Listeria* in a post-lethality handling process and it is an environmental sampling program to detect environmental sites where *Listeria* is present in your facility. For this environmental testing program, generic *Listeria* would be the target for the testing. This control program will require a written outline of the number and size of *Listeria* environmental samples, frequency of sampling, list of sites to be sampled, etc. It is recommended that you start sampling contact sites, which are more likely to be positive for generic *Listeria*. This is further explained in Chapter 3 of the FSIS *Listeria* Guideline. I also have an example of a *Listeria* control program, that was designed for small processors, that I can send to you if you are interested.

Environmental tests which come back positive for *Listeria* should be looked at as a success, not as a problem. It is likely that *Listeria* is surviving in the environment of nearly every operation, and if you continue to get negative results when you are sampling, you may become complacent in your effort to eliminate *Listeria*. When you get a positive contact surface result for *Listeria*, you would know where to prioritize your future cleaning efforts to eliminate *Listeria* in the

future. Think of this process as a “seek and destroy” mission. After getting a positive *Listeria* environmental sample, the equipment or location, where the *Listeria* was found, should be carefully cleaned and sanitized, before another sample is taken.

The cleaning and sanitizing procedures are so important to the success of a *Listeria* program. The words “clean” and “sanitize” are often used interchangeably. In most cases, the cleaning process is intended to remove soil (protein, fat, pathogens, etc) from contact surfaces and the sanitizing process is intended to destroy any pathogens on a surface that were not removed during cleaning. There are a few detergents which reduce *Listeria*’s ability to survive contact with sanitizers, and you are encouraged to ask your detergent supplier if they have any detergents that are able to reduce *Listeria*. On the other hand, sanitizers are not designed to clean (remove soil) from contact surfaces.

There are two other important factors in selecting the proper cleaners: the type of soil (protein, fat, etc.) and the quality of your water supply. The quality of your water supply relates to the type of hardness (e.g., iron, calcium, etc.) and the severity of that hardness. It is recommended that you work with your cleaner supplier to determine which cleaner is best for your operation, the optimal concentration of the cleaner and how to properly mix the cleaner with water. If the equipment isn’t clean before you apply the sanitizer, that sanitizer will be less effective. If you aren’t satisfied with the cleaning ability of the cleaner that your supplier recommends, contact a competing supplier to see what they have to offer.

You will want to select your sanitizer based upon water hardness, types of contact surfaces, etc. Again, it is recommended that you work with your supplier to find the best sanitizer for your situation, the optimal concentration of the sanitizer and how to apply it.

The cleaning and sanitizing processes are typically done by the least experienced employees, often on second or third shift, and often without much training. If cleaning and sanitizing is the best way to prevent environmental contamination of RTE product during packaging, then proper training would be important to insure that equipment is properly cleaned and sanitized. As was mentioned earlier in the hazard analysis discussion, it would be wise to monitor the concentration and application of sanitizers but as GMPs and not a CCP. This could be done by direct observation of employees mixing and/or applying cleaners/sanitizers and documenting the findings.

Because of the potential for environmental contamination by *Listeria monocytogenes*, proper cleaning and sanitizing of facilities and equipment will continue to be a concern for processors of RTE meat products. In addition to selecting the best cleaners and sanitizers, employees doing the cleaning and sanitizing need good training to ensure that these chemicals are being properly used. A *Listeria* control program is the best way to address *Listeria monocytogenes* environmental hazards during packaging of RTE meat products.