

## Post-Processing Pasteurization And Its Effect On Listeria

*Listeria monocytogenes* is the scientific name for a foodborne pathogen that can cause a fatal illness (called Listeriosis) in certain susceptible populations. High-risk populations include pregnant women and their unborn child, newborns, and immunocompromised individuals.

### Foodborne Pathogens

*L. monocytogenes* became recognized as a foodborne pathogen in the early 1980s. After several foodborne outbreaks, federal regulatory agencies established a "zero tolerance" for *L. monocytogenes* in ready-to-eat (RTE) products. These events precipitated a new mindset by the meat industry that sanitation not only involved food-contact surfaces, but rather that it was necessary to clean and sanitize the whole plant environment. Efforts to eradicate *L. monocytogenes* often involve clean room type sanitation standard operation procedures (SSOP's) such as rooms with positive airflow, sanitizing dips for hands and footwear, donning special clothing, and restricting access. Even with these precautions, an occasional low-level incidence of *L. monocytogenes* contamination may occur. Recent foodborne outbreaks and product recalls due to *L. monocytogenes* contamination have refocused the USDA regulatory community on reducing the risk of Listeriosis in the U.S.

### USDA Recommendations

The USDA has proposed several strategies for reducing the risk of Listeriosis including a regulation that would require the end product testing of RTE food products for *L. monocytogenes*. USDA regulated companies may avoid some end-product testing if they implement an intervention step (critical control point or CCP), such as post-packaging pasteurization. This is where Cryovac's experience in post-packaging heat treatments can benefit our customers.

### What Cryovac Found

Post-packaging heat treatments (typically referred to as post-pasteurization) have long been used for whole muscle products that are unavoidably handled after initial thermal processing (Beckwith, 1995). In 1986, Cryovac investigated the effectiveness of post-packaging heat treatments on shelf life extension and pathogen reduction, and was issued a post-pasteurization Statutory Invention Registration (DeMasi and Deily, 1990).

Post-packaging heat treatments generally involve packaged meat heat treatments of 160° to 205°F for time periods varying from 30 seconds to 10 minutes. Initial tests were performed to examine various time and temperature treatments efficacy on spoilage organisms that directly influence product shelf life. Use of Cryovac® CN530 bag and certain post-pasteurization treatments proved beneficial in controlling the microbial counts and extending product shelf life. This generated interest in determining the effectiveness of these treatments on pathogen reduction and a second phase of testing was initiated. Results from that study showed that exposing the surface of a cured ham product to 205°F for either one or two minutes could result in a 10 to 100 fold reduction of *L. monocytogenes*. Additional reports have confirmed the effectiveness of post-packaging heat treatments on reducing microbial populations (Cooksey, et al., 1993; Hardin, et al., 1993; Roering, et al., 1998; Gill, et al., 2001; and Muriana, et al., 2002).

Typical post-packaging heat treatments will not inactivate all organisms; therefore, it should be used as a tool to increase the quality, shelf life and the margin of safety of products that are unavoidably handled after initial heat processing. Post-pasteurization heat treatments should not be viewed as a method to correct for unsanitary practices, and good manufacturing practices must be maintained throughout processing.

## Cryovac® CNP 310 Post-Packaging Heat Treatment Bag

For over fifteen years Cryovac® has applied its cook-in bag technology to post-packaging heat treatment applications. Recently we introduced the **CNP310 Bag** which combines the heat tolerance of a cook-in bag with the merchandising attributes of Cryovac® Barrier Bags and delivers the high-speed sealing, ink adhesion, and abuse resistance processors depend upon. The CNP310 Bag will withstand 210°F for ten minutes while delivering the high gloss, clarity and skin-tight shrink required for the retail meat case display. Processors can now benefit from the extended shelf life and extra margin of food safety afforded by post-packaging heat treatment without sacrificing product appearance. The CNP310 Bag is designed for ready-to-eat smoked and processed products sold by the pound and is ideally suited for deli products such as roast beef, turkey breasts and half-hams. It is currently available as a straight end-seal (CNP310), side-seal (CNP311), or curved side-seal (CNP312) bag in various sizes.



Cryovac® CNP310 Bag

## References

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Gill, et al., 2001. Post-process pasteurization of packaged ham, roast beef, and turkey breast to reduce *Listeria monocytogenes*. Abstract P058. Presented at the 88th Annual Meeting International Association for Food Protection, Minneapolis, MN. August 5-8, 2001

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Roering, et al., 1998. Pasteurization of vacuum-sealed packages of summer sausage inoculated with *Listeria monocytogenes*. J. Food Safety. 18:49-56.