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## Critical Limit Summary: Post-Packaging Pasteurization of Beef Snack Sticks and Natural Casing Wieners to Control *Listeria monocytogenes*

**Background:** If a processor wishes to employ a post-lethality treatment to operate under Alternative 1 or Alternative 2 of the USDA *Listeria* regulation, that treatment must be validated and included in the HACCP plan. This treatment will almost undoubtedly be designated as a CCP.

One potential post-lethality process is post-packaging pasteurization (PPP) of RTE products. Pasteurization can be done in hot water or steam. Critical Limits associated with such a process would include amount of product in a package and how it is packaged, amount and type of heating medium, time of exposure to heating medium.

In order to be considered effective, a post-lethality treatment must result in a 1-log reduction in *L. monocytogenes* (Lm) numbers. If a reduction of at least 2 logs is achieved, USDA testing frequency for treated products will decrease.

**Research Study:** We inoculated three brands each of beef snack sticks and natural casing wieners with *L. monocytogenes* and then packaged these products using a commercially available plastic packaging film specifically designed for PPP applications. Beef sticks were packaged individually or with 4 or 7 sticks per package. Wieners were packaged 4 per package. Each individual package was submerged in 0.7 gal (2.8 liters) of boiling water in a sauce pan on a hot plate and held for a designated time. After PPP, packaged products were cooled in an ice-water slush and then numbers of surviving Lm were determined.

**Research Results:** An average reduction in Lm numbers of at least 2 logs was obtained using heating times of 1.0 minute for individually packaged beef snack sticks and 4.0 minutes for 4- or 7-per-package beef snack sticks. A treatment of 7.0 minutes for four-per-package natural casing wieners was also judged to be of potential commercial use. For all products tested in consumer sensory evaluation panels, the products treated by hot-water PPP (with cooked-out fat and moisture removed) were rated equal to or significantly better than corresponding untreated products.

### Validated Critical Limits:

- Single beef sticks packaged in Curwood, Inc. film SPP94 (Material No. CPS302976; New London, WI) and heated in boiling water (1 package in 0.7 gal) for 1.0 minute.
- Four or seven beef sticks packaged in Curwood, Inc. film SPP94 (Material No. CPS302976; New London, WI) and heated in boiling water (1 package in 0.7 gal) for 4.0 minutes.
- Four natural casing wieners packaged in Curwood, Inc. film SPP94 (Material No. CPS302976; New London, WI) and heated in boiling water (1 package in 0.7 gal) for 7.0 minutes.

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Ingham, S.C., M.D. DeVita, R.K. Wadhwa, M.A. Fanslau, and D.R. Buege. 2005. Evaluation of small-scale hot-water post-packaging pasteurization treatments for destruction of *Listeria monocytogenes* on ready-to-eat beef snack sticks and natural-casing wieners. *Journal of Food Protection*. 68: 2059-2067. For more information contact: Steve Ingham, Extension Food Safety Specialist (608) 265-4801, [scingham@wisc.edu](mailto:scingham@wisc.edu) August, 2007

