

Processing and Pre-shipment Room Temperature-Storage of Pork Rinds/Cracklins

Category: Shelf-stable Ready-To-Eat meat products

USDA HACCP Category: Heat treated, shelf-stable

Processing: Cooking/drying and pre-shipment storage

CCP: cooking/drying, pre-shipment storage

Validates: Product characteristics ensuring no growth of *Listeria monocytogenes* during normal shelf-life of product; pre-shipment storage conditions resulting in death of *L. monocytogenes*.

CCP: The USDA final rule addressing the control of *Listeria monocytogenes* (LM) on ready-to-eat (RTE) meat and poultry products requires processors of RTE products to take one or more specific steps to ensure the absence of LM from their products. In particular, the rule requires processors to adopt one of three designated “Alternatives” to control LM on their products. The Alternatives involve varying levels of control and required microbiological testing of food-contact surfaces. In Alternative 1, the processor uses a post-lethality treatment that reduces or eliminates LM AND an antimicrobial agent or process that suppresses or limits LM growth throughout product shelf-life. In Alternative 2, the processor uses either a post-lethality treatment that reduces or eliminates LM OR an antimicrobial agent or process that suppresses or limits LM growth throughout product shelf-life. Under Alternative 3, only sanitation measures are relied upon to control LM. For pork rinds or cracklins, the reduction of water activity, accomplished through cooking/drying, could serve as an antimicrobial process by making the finished product unsuitable for LM growth. Compliance guidance from USDA has stated that an effective antimicrobial process will allow no more than a 1.0 log increase in LM on an RTE product throughout its shelf-life. In addition, short-term pre-shipment storage may achieve sufficient lethality to serve as a post-lethality treatment (reduction in LM numbers of at least 1.0 logs).

Study Design: Individual pork rind or crackling were inoculated with a 5-strain cocktail of *L. monocytogenes*, re-packaged under air, and then stored at room temperature (70°F / 21°C) for 5 weeks. Numbers of *L. monocytogenes* were determined before storage and after 1 and 5 weeks.

Results and Discussion: Levels of *L. monocytogenes* on the pork rind/cracklin products decreased 1.2 – 2.1 log CFU in the first week of storage, and another 1.0 – 2.1 log CFU in the next 4 weeks. Processing pork rinds or cracklins to yield water activity of ≤ 0.75 , combined with 1 week of 21°C storage, would allow the processor to operate under Alternative 1, with the processing technique as the antimicrobial process and the one-week storage as the post-lethality treatment. Without the pre-shipment room-temperature storage, processors of pork rinds or cracklins could operate under Alternative 2.

Validated Critical Limits based on study results:

- Processing parameters resulting in a product with water activity of 0.75 or lower, AND
- Pre-shipment storage of at least one week at 70°F or warmer

Reference: S.C. Ingham, D.R. Buege, B.K. Dropp, and J.A. Losinski. 2004. Survival of *Listeria monocytogenes* during storage of ready-to-eat meat products processed by drying, fermentation, and/or smoking. *Journal of Food Protection*. 67:2698-2702. A full copy of this research report is available on request.

For more information on this project or the work of the University of Wisconsin Center for Meat Process Validation contact: Steve Ingham, Extension Food Safety Specialist (608) 265-4801, scingham@wisc.edu or Dennis Buege, Extension Meat Scientist (608) 262-0555, drbuege@ansci.wisc.edu March, 2005.