In-package Pasteurization of Ready to Eat (RTE) Meat Products—an Effective Way to Control Post-processing Contamination

Sunil Mangalassary*

Food Science and Technology program, School of Kinesiology and Nutritional Science, California State University, Los Angeles, USA

Ensuring the safety of meat and meat products is always a challenge to the industry. Ready to eat (RTE) meat and poultry products constitute a major share of the processed meat products. The RTE meat and poultry products are in a form that is edible without additional preparation to achieve food safety and may receive additional preparation for palatability or aesthetic, gastronomic, or culinary purposes [1] and therefore often consumed without additional cooking steps. Post-process handling is a cause of recontamination of RTE meat products especially with food pathogen, Listeria monocytogenes. Processing operations such as peeling, sorting, loading, and slicing during preparation of RTE products are potential sources of L. monocytogenes contamination [2]. Since the year 2000, there were many RTE meat product recalls due to Listeria contamination including the very recent, 16,000 tons of RTE meat and poultry product recall by a Minnesota firm in August 2012 [3].

In-package pasteurization is an effective method to reduce post-processing surface contamination by food pathogens [4,5]. The major challenge associated with this technique is to get the maximum lethal effect by using a minimum pasteurization time as the additional heating after the primary thermal process (cooking) will invariably affect the sensory qualities of the product. The product composition, especially thickness was found to be a factor affecting the surface heating rate of the product during in-package pasteurization [6]. Combining in-package pasteurization with other preservative methods was another effective strategy tested where researchers found that the pasteurization time could be significantly reduced when in-package pasteurization was combined with methods such as surface application of natural antimicrobial compounds [7,8].

In-package pasteurization could be practiced as one of the efficient post-processing decontamination techniques primarily because of the fact that it is employed after completing all the handling steps in RTE meat products preparation and the lethal effects obtained will remain at a safer level provided a proper storage temperature and strict retail and consumer handling of the product. One of the challenges for the industry would be to assess the required time and temperature combination which will depend on product thickness and other characteristics. When used in combination with other methods, the bacterial survival curves obtained may not follow first-order kinetics (the survival curves may be of non-linear in nature) and hence the standard use of D and Z-values may result in over or under processing (the survival curves may be of non-linear in nature) and hence the bacterial survival curves obtained may not follow first-order kinetics (the survival curves may be of non-linear in nature) and hence the standard use of D and Z-values may result in over or under processing [8]. More research is needed to standardize various mathematical modeling techniques to suit the specific industry scenario.

References


*Corresponding author: Sunil Mangalassary, Assistant Professor, Food Science and Technology program, School of Kinesiology and Nutritional Science, California State University, Los Angeles, USA, Tel: 323-343-5441; E-mail: smangal@exchange.calstatela.edu

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