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Publication date:
2013

Document Version
Early version, also known as pre-print

[Link back to DTU Orbit](#)

Citation (APA):
Møller, C. O. D. A., Nauta, M., Schaffner, D., Dalgaard, P., Christensen, B. B., & Hansen, T. B. (2013). Quantitative Risk Assessment of Salmonella spp. in fresh pork. Abstract from Advances in Predictive Modeling and Quantitative Microbiological Risk Assessment of Foods, Sao Paulo, Brazil.

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Quantitative Risk Assessment of *Salmonella* spp. in fresh pork

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Summary

1. Introduction and objective: Catering is an important segment of the food industry, as an estimated 70 % of worldwide foodborne illness is linked to food prepared at food service establishments. The aim of this study was to develop a risk model to provide more accurate estimates of salmonellosis by combining observational studies with models developed specifically to pork processing.

2. Methodology: A risk assessment was conducted to assess health risks associated with *Salmonella* spp. by consumption of the Danish meatballs (frikadeller), made with fresh pork, produced in a catering unit. Meatball production and consumption were described as a series of processes (modules), from 1.3 kg meat pieces to 70 g meatballs, followed by a dose response model to assess the risk of illness from consumption of these meatballs using the modular process

risk model approach. Changes in bacterial prevalence, concentration, and unit size were modelled within each module. Fourteen production scenarios were evaluated with the model, to test the impact of heat treatment and cooling rate.

3. Results: The risk estimates revealed that a process comprising heat treatment of meatballs to core temperatures higher than 71°C, and subsequent holding at room temperatures lower than 25°C, for no longer than 3.5 h prior to refrigeration at temperatures of 6°C or lower, were very effective in *Salmonella* control.

4. Conclusion: Survival and growth of *Salmonella* during cooling had significant impact on the risk estimates, and therefore cooling should be considered as an additional critical step to heat treatment during meatball processing.

Keywords: ground meat, *Salmonella*, QMRA, pork, catering

Acknowledgments

This research was financially supported by the Technical University of Denmark through the FoodDTU programme.