

Microbial Risk Profiling of Cooked Chilled Foods

Jeff Daelman, Liesbeth Jacxsens, Frank Devlieghere and Mieke Uyttendaele

Department of Food Safety and Food quality, Ghent University, Belgium

Introduction: Cooked chilled foods, more aptly known as REPFED (refrigerated and processed foods of extended durability), are a very heterogeneous group of food products. To assure their microbial safety, the food industry relies on a combination of mild heat treatment (i.e. pasteurisation), refrigerated storage and consumer instructions for handling and preparation.

Purpose: This research assessed the potential risk to the consumer for different types of REPFEDs, based on the production process, labelling and data collection on prevalence and survival of pathogens.

Methods: The production-processes of 5 Belgian REPFED-producing companies were analysed according to their microbial risk profile. Both historic (n=1533) and new (n=90) analysis results for 3 pathogens (*B. cereus*, *L. monocytogenes* and sulphite reducing Clostridia) were collected for final products on the day of production and for final products at the end of shelf life. The pasteurisation value (P-value) for heat treatment at consumer phase was determined for 50 products by simulating the proposed heat treatment as recommended on the label. Finally, one high-risk product (paella) was challenge-tested (in 12-fold) for survival of *L. monocytogenes* during heat treatment at the consumer phase.

Results: Three types of cooked chilled foods could be distinguished based on the heat treatment applied during the production process ($P_{90}=10$, $P_0=2$ or no safe harbour), while 5 types of REPFEDs could be distinguished based on the heat treatment applied at consumer phase (Ready-to-eat (s.l./s.s.), ready-to-reheat, ready-to-heat and ready-to-cook). The combination of the production and consumer heat treatment ultimately determines the risk to the consumer. None of the analysed products (n=1533) carried unacceptable numbers for any of the three pathogens. Only 10 out of 50 products that were reheated obtained a P-value sufficiently high to eliminate *L. monocytogenes* ($P_0=2$). During the challenge tests of *L. monocytogenes* in paella, the pathogen was able to grow in all 12 replications and remained present in 7 out of 12 replications after reheating at consumer level.

Significance: Results indicate that the current microbial safety of REPFEDs is good, but that a thorough validation of both production-process and final product is necessary to guarantee the food safety. If reheating by the consumer is necessary for food safety, then this process should also be validated.