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Development of predictive models to enhance microbiological safety of ready-to-eat meats

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Abstract

Predictive microbiology has been extensively applied in food production to assess microbiological safety and shelf life of food products as well as to develop product formulation, processes, and control measures. Notable and widely adapted models include those in USDA Pathogen Modeling Program (U.S. Department of Agriculture), Combase (UK's Institute of Food Research, USDA, and Australia's Food Safety Center), and Seafood Spoilage and Safety Predictor (Technical University of Denmark). In the U.S., the consumption of refrigerated ready-to-eat (RTE) meats has increased significantly due to the demand for convenient foods by consumers. Since heating is not required prior to consumption, RTE meats may become a safety risk if they are contaminated with pathogens, particularly *Listeria monocytogenes*, which is capable of growing at refrigeration temperature. Several outbreaks of *L. monocytogenes* induced illnesses have been linked to the consumption of RTE meats. Studies were conducted to examine and develop predictive models for the growth behavior of *L. monocytogenes* in RTE meats as affected by the presence of lactate and diacetate, native microflora, and acid stress. Results showed that the growth of *L. monocytogenes* was significantly delayed by lactate and diacetate at <12°C and by the native microflora (Brochothrix spp.) at 4-8°C and when *L. monocytogenes* was subjected <pH 4 stresses. The effect of these factors on *L. monocytogenes* growth were described in mathematical models that can be used by RTE meat producers to select product formulations and assess product safety to reduce *L. monocytogenes* hazard in RTE meats.

Biography

Cheng-An Hwang obtained a Ph.D. degree in Food Science and Technology from the University of Tennessee in 1992. His work experience includes as research associated with the Center for Food Safety and Quality Enhancement, University of Georgia, as food microbiologist with Nestle Research and Development Center, and, currently, as research food technologist with Eastern Regional Research Center, ARS-USDA. He is a member of the Institute of Food Technologists and the International Association for Food Protection and serves as associate editor for the Food Microbiology and Safety section of Journal of Food Science.