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Book review

Control of foodborne microorganisms

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The food safety issue – and the foodborne diseases of microbial origin on the first place - is one of the main concern of the food industry and health authorities in the new millennium, as it has been emphasised by many scientists (i.e. Farkas, J.: Editorial, Acta Alimentaria (30, 213-125, 2001). The importance of foodborne micro-organisms cannot be overestimated, since hardly 20% of the reported foodborne diseases are resolved, and the causative agents of the rest are unknown in the United States – and probably the situation does not differ very much in other countries either. It also has to be considered that only a small portion of foodborne illness episodes are reported and investigated annually even in the developed world, and the situation in the third world is much worse.

With the societal and consumer habit changes (more travelling and eating out, special diets, need for minimally processed foods, preference for additive- and preservative-free foods, increase in the number of immuno-suppressed, chronically ill and advanced age people, etc.), the food safety risks become greater. New regulation HACCP introduced recently helps the producer to maintain the microbiological quality of food products. The quantitative risk assessment and the predictive modelling relying on science provide the scientific base necessary for regulatory decision-makers.

The majority of antimicrobial treatments applied singly or in combination (hurdles) are generally effective against pathogens that need to reach high numbers and to produce toxins to cause human illness. In recent years, however, the concerns have been focused on pathogens infecting in low numbers (i.e. *E. coli* O157:H7, certain *Salmonella* serotypes, parasites and viruses), or on those that proliferate also at refrigeration temperature (like *Listeria monocytogenes*). It has also been indicated recently that pathogenic bacteria develop systems that assist them to survive and adapt to environmental stresses, and that exposure to one stress and activation of protective genes often lead to cross-protection against other stresses. Food environments are generally stressful for bacteria (i.e. low moisture level, restricted availability of nutrients, some acids, chemicals are at stressful level, presence of competitive microflora, etc.). Stresses present in foods naturally or artificially have great effect on gene expression in bacterial pathogens, and some of the genes might be associated with bacterial virulence.

Preservation technologies face besides the well-known “traditional” problems the new ones discussed above. In the last years a number of new food preservation technologies have been developed and have become or are becoming applicable in the industry. Some, however effective they are, have only limited application area, because of the changes in the quality of food, and some are impractical to use in certain products.

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The book, each chapter is written by experts in the field, focuses on the latest results of food preservation methods such as thermal inactivation, cold, irradiation, microwave treatment, chemical preservation, naturally occurring antimicrobials – including bacteriolytic enzymes and bacteriocins –, high-intensity pulsed electric fields, magnetic fields, high pressure, ohmic heating. The effect of acids is discussed in relation to botulinal safety and modeling the inactivation of other pathogenic bacteria by acids is also presented. The microbial control by packaging, the effect of CO_2 at elevated pressure, and that of different gases at low and ambient pressure have also been dealt with. A broad outlook of the subject is provided by chapters on the management of microbial control in HACCP systems and on hurdle technology. The chapters are followed by a list of recent references on the given field, and an index at the end of the book helps fast and easy orientation.

I have found the book very informative, easy to handle and to read and I highly recommend it to both theoretical and practical food-microbiologists.

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