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Nota di contenuto	A. Introduction and Overview -- 1. The Microbiological Safety of Spices and Low Water Activity Foods: Correcting Historic Misassumptions.-2. Challenges in the Control of Foodborne Pathogens in Low-Water Activity Foods and Spices -- B. Pathogen Persistence and Control in Low aw Foods and Processing Plants -- 3. Adaptation of Pathogenic Microorganisms to Dry Conditions -- 4. Transcriptomic Responses of Salmonella Species to Desiccation and Low-Moisture Environments: Extending Our Knowledge of How Bacteria Cope with Low-Moisture Stress -- 5. Processing Plant Investigations: Practical Approaches to Determining Sources of Persistent Bacterial Strains in the Industrial Food Processing Environment -- 6. Dry Cleaning, Wet Cleaning and Alternatives to Processing Plant Hygiene and Sanitation -- C. Low aw Food Commodities of Interest -- 7. Spices -- 8. Dried Dairy-Based Products -- 9. Low Water Activity Meat Products -- 10. Dried, Ready-

to-Eat Cereal Products -- 11. Powdered Infant Formula -- 12. Nuts and Nut Pastes -- 13. Flour and Meal -- 14. Chocolate and Confectionary -- 15. Salty Snack Foods -- 16. Pet Foods -- 17. Dried Teas and Herbs -- D. Product Testing -- 18. Regulatory Testing Guidelines and Recommendations -- 19. Methodological and Sampling Challenges to Testing Spices and Low aw Foods for the Presence of Foodborne Pathogens -- E. Low aw Food Decontamination -- 20. Irradiation, Microwave and Alternative Energy-Based Treatments for Low Water Activity -- 21. Heat and Steam Treatments -- F. Research Needs -- 22. Research Gaps and Needs Pertaining to Microbial Pathogens in Spices and Low aw Foods.

Sommario/riassunto

Low water activity (aw) and dried foods such as dried dairy and meat products, grain-based and dried ready-to-eat cereal products, powdered infant formula, peanut and nut pastes, as well as flours and meals have increasingly been associated with product recalls and foodborne outbreaks due to contamination by pathogens such as *Salmonella* spp. and enterohemorrhagic *E. coli*. In particular, recent foodborne outbreaks and product recalls related to *Salmonella*-contaminated spices have raised the level of public health concern for spices as agents of foodborne illnesses. Presently, most spices are grown outside the U.S., mainly in 8 countries: India, Indonesia, China, Brazil, Peru, Madagascar, Mexico and Vietnam. Many of these countries are under-developed and spices are harvested and stored with little heed to sanitation. The FDA has regulatory oversight of spices in the United States; however, the agency's control is largely limited to enforcing regulatory compliance through sampling and testing only after imported foodstuffs have crossed the U.S. border. Unfortunately, statistical sampling plans are inefficient tools for ensuring total food safety. As a result, the development and use of decontamination treatments is key. This book provides an understanding of the microbial challenges to the safety of low aw foods, and a historic backdrop to the paradigm shift now highlighting low aw foods as vehicles for foodborne pathogens. Up-to-date facts and figures of foodborne illness outbreaks and product recalls are included. Special attention is given to the uncanny ability of *Salmonella* to persist under dry conditions in food processing plants and foods. A section is dedicated specifically to processing plant investigations, providing practical approaches to determining sources of persistent bacterial strains in the industrial food processing environment. Readers are guided through dry cleaning, wet cleaning and alternatives to processing plant hygiene and sanitation. Separate chapters are devoted to low aw food commodities of interest including spices, dried dairy-based products, low aw meat products, dried ready-to-eat cereal products, powdered infant formula, nuts and nut pastes, flours and meals, chocolate and confectionary, dried teas and herbs, and pet foods. The book provides regulatory testing guidelines and recommendations as well as guidance through methodological and sampling challenges to testing spices and low aw foods for the presence of foodborne pathogens. Chapters also address decontamination processes for low aw foods, including heat, steam, irradiation, microwave, and alternative energy-based treatments. The Food Microbiology and Food Safety series is published in conjunction with the International Association for Food Protection, a non-profit association for food safety professionals. Dedicated to the life-long educational needs of its Members, IAFP provides an information network through its two scientific journals (*Food Protection Trends* and *Journal of Food Protection*), its educational Annual Meeting, international meetings and symposia, and interaction between food

safety professionals.
