PART 1 RISK ASSESSMENT AND MANAGEMENT IN THE FOOD CHAIN

Introduction
C de W Blackburn and P J McClure, Unilever, UK
- Trends in foodborne disease
- Incidence of foodborne disease
- Foodborne disease surveillance
- Emerging foodborne disease and changing patterns in epidemiology
- Control of foodborne disease
- Rationale for this book
- References

Detecting pathogens in food
R Betts, Campden & Chorleywood Food Research Association and C de W Blackburn, Unilever, UK
- Introduction
- Quality control and quality assurance
- Role of microbiology methods
- Applying microbiological testing
- Sampling
- Conventional microbiological techniques
- Rapid and automated methods
- Future trends
- References and further reading

Modeling the growth, survival and death of microbial pathogens in foods
J D Legan, Kraft Foods, C M Stewart, Silliker Inc. and M B Cole, National Center for Food Safety and Technology, USA

Risk assessment and pathogen management
T Ross and T A McMeekin, University of Tasmania, Australia
- Introduction
- Approaches to modeling
- Kinetic growth models
- Growth boundary models
- Kinetic death models
- Time to inactivation models
- Survival models
- Applications of models
- Future trends
- Sources of further information and advice
- Acknowledgements
- References

Emerging foodborne pathogens and the food industry
L Smoot, Nestlé USA, USA and J-L Cordier, Nestlé Nutrition, Switzerland
- Introduction
- Factors contributing to the emergence of new pathogens
- How to identify emerging pathogens: sources of information
- Management options
- Future trends
- References
Pathogen control in primary production: meat, dairy and eggs
G Duffy, Ashtown Food Research Centre, Ireland
- Introduction
- Identifying and assessing hazards and risks
- Managing and controlling hazards and risks with ruminant animals
- Managing and controlling hazards and risks with pigs
- Managing and controlling hazards and risks with poultry
- Managing and controlling hazards and risks with eggs
- Future strategies and regulatory issues
- Sources of further information and advice
- References

Pathogen control in primary production: crop foods
R Early, Harper Adams University College, UK
- Introduction
- Quality and safety in the food chain
- Crops as foodstuffs for humans
- Microbial food safety and food crops
- Fungal pathogens and mycotoxins
- Bacterial pathogens
- Viral and parasitic pathogens
- Food safety management in crop production
- Good agricultural practice (GAP)
- Good agricultural practice and food safety management
- Hazard analysis critical control point system (HACCP)
- Developing a food safety management system
- Implementing and maintaining HACCP systems
- Farm assurance
- Future trends
- Conclusions
- Sources of further information and advice
- References

Pathogen control in primary production: fisheries and aquaculture
B Vogel, National Institute of Aquatic Resources, Denmark
- Introduction
- Identifying and assessing hazards and risk
- Managing and controlling hazards and risk
- Future trends
- Sources of further information and advice
- References

Pathogen control in primary production: bivalve shellfish
W Dore, Marine Institute, Ireland
- Introduction
- Identifying and assessing hazards and risk
- Managing and controlling hazards and risks
- Future trends
- Sources of further information and advice
- References

Hygienic plant design
J Holah, Campden & Chorleywood Food Research Association, UK
- Introduction
- Barrier 1: the factory site
- Barrier 2: the factory building
- Barrier 3: high risk production area
- Barrier 4: product enclosure
- The design of smaller manufacturing and catering operations
- Future trends
- Sources of further information and advice
- References

Hygienic equipment design
A Hastings, Tony Hastings Consulting, UK
- Introduction
- Regulatory requirements
- Hygienic design principles
- Hygienic design requirements
- Hygienic design of some major equipment items
- Conclusions
- Future trends
- Sources of further information and advice
- References

Sanitation
J Holah, Campden & Chorleywood Food Research Association, UK
- Introduction
- Sanitation principles
- Sanitation chemicals
- Sanitation methodology
- Sanitation procedure
- Evaluation of sanitation effectiveness
- Future trends
- Sources of further information and advice
- References

Safe process design and operation
M Brown, mhb Consulting, UK
- Introduction: product and process design
- Principles of process design
- Designing and validating product and process designs
- Modelling and product/process design
- Safety management tools: good manufacturing practice (GMP), hazard analysis critical control point system (HACCP) and risk assessment
- Process flow and equipment
- Manufacturing areas
- Processing and handling products
- Control systems
- Conclusions
- Future trends
- References and further reading

The effective implementation of HACCP systems in food processing
A Mayes, Unilever Colworth, UK and S Mortimore, Land O'Lakes Inc, USA
Good practice for food handlers and consumers
C Griffith and E Redmond, University of Wales Institute Cardiff, UK
- Introduction
- Food handling practices and food safety management systems
- Understanding food handlers’ behaviour
- Helping people to change behaviour: education and training
- Future trends
- References

PART 2 BACTERIAL HAZARDS

Preservation principles and technologies
G Gould, University of Leeds, UK
- Introduction
- Basis of food preservation, safety and the extension of shelf life
- Major food preservation and safety technologies
- New and emerging technologies
- Natural antimicrobial systems
- Conclusions
- Sources of further information and advice
- References

Pathogenic Escherichia coli
C Bell, Independent Consultant Microbiologist and A Kyriakides, Sainsbury’s Supermarkets Ltd, UK
- Introduction
- Characteristics of Escherichia coli
- Risk Factors for Escherichia coli O157
- Detecting Escherichia coli
- Control of pathogenic Escherichia coli in foods
- Raw material control
- Control in processing
- Final product control
- Future trends
- Sources of further information and advice
- References

Salmonella
C Bell, Independent Consultant Microbiologist and A Kyriakides, Sainsbury’s Supermarkets Ltd, UK
- Introduction
- Characteristics of Salmonella
- Risk factors for Salmonella
- Detecting Salmonella
- Control of Salmonella in foods
- Raw material control
- Control in processing
- Final product control
- General considerations
- Future trends
- Sources of further information and advice
- References

Listeria monocytogenes
C Bell, Independent Consultant Microbiologist and A Kyriakides, Sainsbury’s Supermarkets Ltd, UK
- Introduction
- Characteristics of Listeria monocytogenes
- Risk factors for Listeria monocytogenes
- Detecting Listeria monocytogenes
- Control of Listeria monocytogenes in foods
- Raw material control
- Control in processing
- Final product control
- Future trends
- Sources of further information and advice
- References

**Campylobacter and Arcobacter**
*C de W Blackburn and P J McClure, Unilever, UK*
- Introduction
- General characteristics of Campylobacter and Arcobacter species
- Nature of Campylobacter and Arcobacter infections
- Growth and survival characteristics
- Risk factors for Campylobacter
- Risk factors for Arcobacter
- Methods for Campylobacter
- Methods for Arcobacter
- Control procedures for Campylobacter
- Control procedures for Arcobacter
- Future trends
- Sources of further information
- References

**Other Gram-negative bacterial pathogens**
*S Forsythe, Nottingham Trent University, J Sutherland and A Varnam, University of North London, UK*
- Introduction
- Characteristics of the genus Yersinia
- Characteristics of the genus Shigella
- Characteristics of the genus Vibrio
- Characteristics of the genera Aeromonas and Plesiomonas
- Characteristics of the genera Cronobacter
- Enterobacter, Klebsiella, Pantoea and Citrobacter species
- References

**Staphylococcus aureus and other pathogenic Gram positive cocci**
*M Adams, University of Surrey, UK*
- Introduction
- Staphylococcus aureus and other enterotoxigenic staphylococci
- Other Gram positive cocci
- Future trends
- Sources of further information and advice
- References

**Pathogenic Bacillus species**
*C de W Blackburn and P J McClure, Unilever, UK*
- Introduction
- General characteristics of pathogenic Bacillus species
- Nature of Bacillus food-poisoning
- Growth and survival characteristics
- Other Bacillus species, B
- subtilis, B
- licheniformis, B thuringiensis
- Risk factors
- Methods of detection and enumeration
- Control procedures
- Future trends
- Sources of further information and advice
- Acknowledgements
- References

**PART 3 OTHER AGENTS OF FOODBORNE DISEASE**

**Hepatitis viruses and emerging viruses**
*K Mattison, S Bidawid and J Farber, Health Canada, Canada*
- Introduction
- Description of the organisms
- Risk factors
- Detection methods
- Control issues
- Future trends
- Sources of further information and advice
- References

**Parasites: Cryptosporidium, Giardia, Cyclospora, Entamoeba histolytica, Toxoplasma gondii and pathogenic free-living amoebae (Acanthamoeba spp. and Naegleria fowleri) as foodborne pathogens**
*H Smith, Stobhill Hospital and R Evans, Raigmore Hospital, UK*
- Introduction
- Description of the organisms
- Current levels of incidence
- Conditions of growth
- Methods of detection and enumeration
- Future trends
- Sources of further information and advice
- Glossary
- References

**Foodborne helminth infections**
*K Murrell, University of Copenhagen, Denmark and D W T Crompton, University of Glasgow, UK*
- Introduction
- Main features of foodborne helminth infections
- Helminth detection and diagnosis
- Approaches to prevention and control
- Future trends
- Acknowledgements
- References

**Toxigenic fungi**
*M Moss, University of Surrey, UK*
- Introduction
- Aflatoxins: occurrence and significance
- Aflatoxin: control measures
- Ochratoxin A: occurrence and significance
- Ochratoxin A: control measures
- Patulin: occurrence and significance
Mycobacterium paratuberculosis

M Griffiths, University of Guelph, Canada

- Introduction
- Johne’s disease
- Crohn’s disease
- Mycobacterium paratuberculosis (MAP) and Crohn’s disease
- Prevalence of Mycobacterium paratuberculosis in foods
- Survival of Mycobacterium paratuberculosis in foods
- Survival of Mycobacterium paratuberculosis in the environment
- Detection, enumeration and typing
- Control
- Conclusions
- Sources of further information and advice
- References

Transmissible Spongiform Encephalopathy (Prion Disease)

P Brown, formerly National Institutes of Health, USA and Institute of Emerging Diseases, France

- Introduction
- The pathogen
- Epidemiology of Bovine Spongiform Encephalopathy (BSE) and variant Creutzfeldt-Jakob Disease (vCJD)
- Origins of BSE
- Origins of vCJD
- Symptoms of vCJD
- Risk factors
- Other potential sources of contamination
- Methods of detection
- Prevention and control
- Future trends
- Acknowledgment
- Sources of further information and advice
- References

Histamine fish poisoning: new information to control a common seafood safety issue

P Dalgaard and J Emborg, Technical University of Denmark, Denmark

- Introduction
- Histamine and histamine fish poisoning (HFP)
- Histamine producing bacteria
- Management of histamine formation and histamine fish poisoning
- Conclusions
- Future trends
- Sources of further information and advice
- References
Gastroenteritis viruses
E Duizer and M Koopmans, National Institute for Public Health and the Environment, The Netherlands
- Introduction
- Noroviruses and other gastroenteritis viruses
- Epidemiology of viral gastroenteritis and examples of viral foodborne outbreaks
- Detection
- Transmission routes
- Conditions of growth and survival
- Prevention and control
- Future trends in viral food safety
- References and further reading