PART 1 FARM LEVEL PRODUCTION AND REGULATION OF FRESH PRODUCE

Best practice in large-scale production of fresh produce
I B Jochumsen, AgroManagement, Denmark
- Introduction
- Risk assessment at the farm level
- Following the steps in the production chain
- Conclusion

Niche farm fresh products
A N Jensen and D L Baggesen, Technical University of Denmark, Denmark
- Introduction
- Human pathogen contamination of ‘niche products’
- The difference in contamination risk for ‘niche products’
- Conclusion
- Questions for discussion
- Acknowledgments
- References

Guidelines and protocols for safe practice in fresh produce production: FDA legislation
E Snellman, FDA, USA
- Introduction: a new strategy is tested
- Early produce safety policy
- Challenges in good agricultural practices (GAPs) implementation
- What more can we do?
- A pivotal outbreak prompts a policy shift
- New mandates: modernization of food safety
- Future trends: back to the call
- Questions for discussion
- Acknowledgements
- References

Issues surrounding the European fresh produce trade: a global perspective
M Uyttendaele, L Jacxsens and S Van Boxstael, Ghent University, Belgium
- Introduction
- Challenges involved in the fresh produce trade
- Regulatory and economic aspects
- Best practice in agriculture
- Troubleshooting approaches
- Conclusion and future trends
- Questions for discussion
- Acknowledgements
- Sources of further information and advice
- References

Zoonotic transfer of pathogens from animals to farm products
D J Bolton, Teagasc – Ashtown Food Research Centre, Ireland, T S Edrington, D J Nisbet and T R Callaway, US Department of Agriculture, USA
- Introduction
- Zoonotic foodborne pathogenic bacteria in animals: prevalence estimates in food animal species
- Survival, spread and transmission
- How to stop pathogen transfer from and between live animals
- Pathogen control strategies in live animals: novel solutions
- Conclusion
- Questions for discussion
- References
PART 2 ENVIRONMENTAL ISSUES IMPACTING THE POTENTIAL SAFETY OF FRESH PRODUCE

Postharvest washing as a critical control point in fresh produce processing: alternative sanitizers and wash technologies
K Warriner and A Namvar, University of Guelph, Canada
- Introduction
- When postharvest washing goes wrong
- Approved sanitizers for fresh cut processing
- Current postharvest decontamination methods
- Best practices in post-harvest washing
- Future trends
- Conclusion
- Questions for discussion
- Acknowledgements
- Sources of further information and advice
- References

Preventing cross-contamination during produce wash operations
Y Luo, USDA, USA, D T Ingram, FDA, USA and K Khurana, Pulse Instruments, USA
- Introduction: commercial produce wash operation, water quality and sanitizer concentration
- Changes in sanitizer concentration during wash
- Factors affecting pathogen survival and cross-contamination during wash
- Common industrial practices: process flow and re-wash
- Conclusion
- Questions for discussion
- References

Organic environmental chemical contaminants in fresh produce and fruits
T L Cederberg, Technical University of Denmark, Denmark
- Introduction
- Regulatory aspects
- Modelling of uptake
- Contaminated sites and risk assessments
- Conclusion and future trends
- Questions for discussion
- References

Water: waste, recycling and irrigation in fresh produce processing
C Chaidez, Centro de Investigacion en Alimentacion y Desarrollo, Mexico, M Soto, The University of Arizona, USA and M Jimenez, Universidad Autonoma de Sinaloa, Mexico
- Introduction
- Technological challenges
- Significant factors in environmental challenges to food safety
- Regulatory and economic aspects
- Market issues
- Critical factors in using irrigation water
- Troubleshooting and best practice
- Conclusion and future trends
- Questions for discussion
- References

Maintaining sustainable and environmentally-friendly fresh produce production in the context of climate change
D Pimentel and M Burgess, Cornell University, USA
- Introduction
- Experimental design
- Soil content in the organic and conventional farming systems
PART 3 COMMERCIAL SOLUTIONS FOR FRESH PRODUCE SAFETY

**Reducing waste in fresh produce processing and households through use of waste as animal feed**
*J Zentek, F Knorr and A Mader, Freie Universität-Berlin, Germany*
- Introduction
- Legal aspects for using food waste and by-products for animal feed
- Feedstuffs from catering waste
- Feedstuffs from the processing of fruits and vegetables
- Feedstuffs from other food processing systems
- Conclusion
- Questions for discussion
- References

**Risk assessment of microbial and chemical contamination in fresh produce**
*S Koseki, National Food Research Institute, Japan*
- Introduction
- The frequency with which bacterial pathogens contaminate fresh produce
- How bacterial pathogens contaminate fresh produce
- How bacterial pathogens respond on fresh produce
- Future trends
- Questions for discussion
- Acknowledgement
- References

**Modified atmosphere packaging for fresh produce**
*S Shayanfar, German Institute of Food Technologies (DIL), Germany*
- Introduction
- Challenges of modified atmosphere packaging (MAP) storage
- Regulatory aspects, economic aspects and market issues
- Novel trends in modified atmosphere packaging
- Troubleshooting approaches
- Future trends
- Questions for discussion
- Sources of further information and advice
- References

**Biocontrol of Listeria monocytogenes on fresh produce**
*K Jordan and A Casey, Teagasc Food Research Centre, Ireland, A Hoehl, BOKU - University of Natural Resources and Life Sciences, Austria and G Bruggeman, Nutrition Sciences N V, Belgium*
- Introduction
- Outbreaks and control of Listeria monocytogenes on fresh produce
- Opportunities for biocontrol
- Conclusion
- Acknowledgements
- References

**Commercial and novel solutions for fresh produce safety**
*A Lee, Illinois Institute of Technology, USA*
- Introduction
- Sanitizers used in fresh-cut processing
- Use of novel processing technologies
- Conclusion
- References
Ionizing irradiation for phytosanitary applications and fresh produce safety
S Pillai and C Bogran, Texas A&M University, USA and C Blackburn, International Atomic Energy Agency, Austria
- Introduction
- Technology
- Pathogen issues in fresh produce
- Regulatory aspects and consumer acceptance
- Challenges facing food irradiation
- Conclusion and future trends
- Acknowledgements
- References

Edible coatings for fresh and minimally processed fruits and vegetables
L Ciolacu, and A I Nicolau Dunarea de Jos University of Galati, Romania and J Hoorfar, Technical University of Denmark, Denmark
- Introduction: development of edible coatings
- Types of edible coatings
- Antimicrobial properties of edible films
- Challenges for ecology
- Consumer perceptions
- Regulatory and economic aspects
- Production and market issues
- Further developments
- Questions for discussion
- Sources of further information and advice
- References

PART 4 LABORATORY TESTING FOR FRESH PRODUCE SAFETY

Pathogen testing in fresh produce: Earthbound Farm
W Daniels, Earthbound Farm, USA
- Introduction
- The investigation
- A multi-hurdle approach to food safety
- Testing is not the only answer
- Examining the data
- Lessons learned
- Conclusion
- Questions for discussion

Capacity building of legislative fresh produce testing in China
Z Ye, S Chen, F Wang and T, Chen, Chinese Academy of Agricultural Sciences, China and L Xiao, National Certification and Accreditation Administration, China
- Introduction
- General situation of the Chinese legislative testing system for agro-product quality and safety
- Challenges in building capability of legislative testing
- Regulations and policies for legislative testing
- The role of legislative testing in agricultural economy development
- The role played by legislative testing in production and trade
- Achievements in capacity building of legislative testing for agro-product quality and safety
- Future trends
- References

Bottlenecks and limitations in testing for pathogens in fresh produce
J Hoorfar, Technical University of Denmark, Denmark, P Feng, US Food and Drug Administration, USA, G Duffy, Teagasc Food Research Centre, Ireland, B Malorny, Bundesinstitut für Risikobewertung (BfR), Germany and R Binet, US Food and Drug Administration, USA
- Introduction
New developments in safety testing of soft fruits
R Morales-Rayas and M W Griffiths, University of Guelph, Canada and A C Shultz, Technical University of Denmark
- Introduction
- Soft fruit
- Microbial pathogens of safety concern in soft fruits
- Methods for evaluation of microbial safety in soft fruit
- Conclusion and future trends
- Questions for discussion
- References

Cases of public emetic events due to foodborne viruses and potential issues for fresh produce
S M Markland, D H D'Souza and K E Kniel, University of Delaware, USA
- Introduction
- Challenges in containing virus spread
- Significant factors affecting outbreaks
- Regulatory and economic aspects
- Production and market issues
- Troubleshooting approaches and laboratory methods
- Future trends
- Conclusion
- Questions for discussion
- Acknowledgements
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PART 5 CASE STUDIES IN REAL-LIFE SITUATIONS

Sprout-associated outbreaks and development of preventive controls
M A Smith, US Food and Drug Administration, USA
- Introduction
- Initial sprout safety concerns and recommendations
- Challenges in sprout safety
- Knowledge and research needs
- Further developments in sprout safety hazards
- Addressing sprout safety hazards
- Conclusion
- Questions for discussion
- Sources of further information and advice
- References

Leafy greens: the case study and real-life lessons from a Shiga-toxin-producing Escherichia coli (STEC) O145 outbreak in romaine lettuce
M A Baloch, US Centers for Disease Control and Prevention, USA
- Introduction
- Challenges faced by the experts involved
- Significance of the pathogen that caused the case
- Geographical and climate factors
- Regulatory and economic aspects
- Industry and market aspects
- Addressing the outbreak
The case of the European E coli outbreak from sprouts

P Luber, Federal Office of Consumer Protection and Food Safety (BVL), Germany

- Troubleshooting approaches and laboratory methods
- Future trends
- Questions for discussion
- Acknowledgements
- Sources of further information and advice
- References

Case study on the safety and sustainability of fresh bottled coconut water

E H M Walter, Embrapa Food Technology, Brazil, A Y Kuaye, State University of Campinas, Brazil and J Hoorfar, Technical University of Denmark, Denmark

- Troubleshooting approaches and laboratory methods
- Future trends
- Questions for discussion
- Acknowledgements
- References

Control of fresh produce safety in Denmark

J Hoorfar, Technical University of Denmark, Denmark

- Troubleshooting approaches and laboratory methods
- Future trends
- Questions for discussion
- Acknowledgements
- References

Mushroom production in China: the illegal use of fluorescent whitening agents (FWAs) and related outbreaks

X Zhao and Z Xing, Shanghai Academy of Agricultural Sciences, China

- Troubleshooting approaches and laboratory methods
- Future trends
- Questions for discussion
- Acknowledgements
The case of lemons in caves: a sustainable storage system for Turkish lemons
A I Nicolau, Dunarea de Jos University of Galati, Romania

- Introduction
- Microbiological problems during storage
- Troubleshooting approaches
- Challenges for lemon storage
- Geographical and regional significance, climate and general consumer perceptions
- Regulatory aspects
- Economic aspects
- Production and market issues
- Further developments
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- Sources of further information and advice
- References