PART 1 SAFETY AND QUALITY OF PACKAGED MEAT, POULTRY AND SEAFOOD

Major microbiological hazards associated with packaged fresh and processed meat and poultry
C N Cutter, R N Senevirathne, V P Chang, R B Cutaia, K A Fabrizio, A M Geiger, A M Valadez and S F Yoder, Pennsylvania State University, USA

- Introduction: survival and growth of microorganisms in meat and poultry products
- Vacuum packaging (VP) and modified atmosphere packaging (MAP) to control microbial populations associated with meat and poultry products
- Notable foodborne outbreaks related to packaged fresh and further processed meat and poultry
- The future of food packaging for controlling pathogens associated with fresh and further processed meat and poultry

Major microbial hazards associated with packaged seafood
L Lampila, LSU Agricultural Center and Louisiana Sea Grant College Program, K McMillin, LSU Agricultural Center, USA

- Introduction
- Seafood spoilage
- Major microbiological hazards associated with fresh seafood
- Live animals
- Major hazards associated with processed and packaged seafood
- Future trends

Sensory and quality properties of packaged fresh and processed meats
M G O’Sullivan and JP Kerry, University College Cork, Ireland

- Introduction
- Packaging of fresh and processed meats
- Colour development in fresh and processed meats
- Flavour of fresh and processed meat products
- Texture of fresh and processed meat
- Future trends
- Acknowledgements

Sensory properties of packaged fresh and processed poultry meat
B Min, University of Maryland Eastern Shore, DU Ahn, Iowa State University, USA and Seoul National University, Korea

- Introduction
- Color changes in packaged fresh and processed poultry meat
- Lipid oxidation in packaged, fresh and processed poultry meat
- Tenderness and packaged fresh and processed poultry
- Other sensory and quality issues associated with packaged fresh and processed poultry meat
- Future trends

Sensory and quality properties of fresh, frozen and packaged fish
G Hyldeig J Nielsen, M Timm Heinrich and H H Nielsen, DTU Aqua, Denmark

- Introduction
- Composition of fish
- Initial biochemical and microbiological deterioration of fish
- Lipid oxidation
- Sensory quality changes in stored and packaged fish products
- Case studies of sensory quality changes in stored and packaged fish products
- Shrimps
- Future trends

References
PART 2 DEVELOPMENTS IN VACUUM AND MODIFIED ATMOSPHERE PACKAGING OF MEAT, POULTRY AND SEAFOOD

Advances in the packaging of fresh and processed meat products
K W McMillin Louisiana State University and J N Belcher, Sealed Air Corporation, USA
- Introduction
- Current technologies and use of packaging for fresh and processed meat
- Advances in overwrap, vacuum packaging (VP), and modified atmosphere packaging (MAP) for fresh and processed meat
- Effective application of packaging to improve the quality of fresh and processed meat
- Future trends
- Sources of further information and advice
- References

Advances in vacuum and modified atmosphere packaging of poultry products
A A Argyri, E Z Panagou and G-J E Nychas, Agricultural University of Athens, Greece
- Introduction
- Role of packaging and conventional packaging systems
- Shelf life of fresh and processed poultry products in conventional packaging systems
- Extension of shelf life and future trends in packaging systems
- Chemical indicators for assessing the quality of fresh and processed poultry
- Sources of further information and advice
- References

Advances in bulk packaging for the transport of fresh fish
A Â Hansen, Nofima, Norway; E Svanes, O J Hanssen, Mie Vold and B T Rotabakk, Nofima, Norway
- Introduction
- Status and challenges
- Advances in bulk packaging for transportation of processed fish
- Effective application of bulk packaging for transportation of raw fish products
- Future trends in seafood packaging and distribution
- References

Advances in vacuum and modified atmosphere packaging of fish and crustaceans
G C Fletcher, The New Zealand Institute for Plant & Food Research Limited, New Zealand
- Introduction
- Innovations in packaging technology
- Advances in understanding spoilage processes in packaged fish
- Advances in understanding food safety implications of packaging
- Applying and modelling different gas configurations for different fish
- Applying packaging technologies to products other than fresh fillets
- Combining packaging technologies with other treatments
- Conclusions
- References

Advances in vacuum and modified atmosphere packaging of shellfish
L Pastoriza and M Bernárdez, Instituto de Investigaciones Marinas (IIM-AECSIC), Spain
- Introduction
- Combination of modified atmosphere packaging (MAP) and vacuum packaging (VP) with other treatments
- Effective application of traditional, VP and MAP to improve shellfish quality
- Future trends
- Sources of further information and advice
- References

Solubility of carbon dioxide in muscle foods and its use to extend the shelf life of packaged products
B T Rotabakk and M Sivertsvik, Nofima, Norway
- Introduction
- The principle of modified atmosphere packaging (MAP)
- Effect of Coon microorganisms
- Alternatives to modified atmosphere packaging
- References

PART 3 OTHER PACKAGING METHODS FOR MEAT, POULTRY AND SEAFOOD PRODUCTS

Packaging of retort-processed seafood, meat and poultry
J Bindu, C N Ravishankar and T K S Gopal, Central Institute of Fisheries Technology, India
- Introduction
- Rigid metal containers for retort processed seafood, meat and poultry
- Semi-rigid and flexible containers
- Methods to test the suitability of packaging materials for retorting
- Changes in the quality of seafood, meat and poultry due to retort processing
- Future trends in processing and packaging
- References

Packaging for frozen meat, seafood and poultry products
A Totosaus, Tecnológico de Estudios Superiores de Ecatepec, México
- Introduction
- Quality improvement through frozen packaging
- Recent advances in frozen packaging
- Future trends
- References

Advances in the manufacture of sausage casings
Z Savic, Victus International, Austria
- Introduction
- Definition and types of sausage casings
- Advances in sausage casings
- Effective selection and use of sausage casings for optimum product quality - possible meat product defects due to incorrect selection of casing types
- Meat industry requirements for new casing types
- Future trends
- Sources of further information and advice
- References

Packaging of ready-to-serve and retail-ready meat, poultry and seafood products
H Walsh and J Kerry, University College Cork, Ireland
- Introduction
- Key drivers
- Packaging requirements
- Microwave reheating
- Packaging techniques
- Active packaging applications
- Future trends
- References

In-package pasteurization of ready-to-eat meat and poultry products
L Huang and C-A Hwang, United States Department of Agriculture Agricultural Research Service (USDA ARS), USA
- Introduction
- In-package pasteurization
- Time-temperature for in-package pasteurization
- Equipment
- Practical considerations
- References
PART 4 EMERGING PACKAGING TECHNIQUES AND LABELLING

Environmentally-compatible packaging of muscle foods
*P Dawson and K Cooksey, Clemson University, USA*
- Introduction
- Types of meat packaging materials
- Source reduction
- Recyclable materials
- Biobased materials
- Future trends
- References

Antimicrobial and antioxidant active packaging for meat and poultry
*V Coma, Université de Bourdeaux, France*
- Introduction
- Meat safety and quality concerns
- Active packaging based on biopolymers and natural bioactives
- Antimicrobial bioactive packaging
- Antioxidant bioactive biopackaging
- Future trends
- Conclusion
- Acknowledgements
- References

Edible films for meat, poultry and seafood
*M Janes, Louisiana State University, USA*
- Introduction
- Edible film materials
- Edible films containing antioxidants and other nutrients
- Conclusion
- References

Application of smart packaging systems for conventionally packaged muscle-based food products
*J Kerry, University College Cork, Ireland*
- Introduction
- Packaging technologies for gas and moisture control
- Antimicrobial packaging
- Other applications of smart/active technologies
- Sensors for smart packaging
- Indicators for smart packaging
- Radio frequency Identification Tags (RFID) and potential future applications of other smart/intelligent technologies
- Conclusions
- References

Traceability in the meat, poultry and seafood industries
*K W McMillin, Louisiana State University Agricultural Center, L Lampila, Louisiana State University Agricultural Center and Louisiana Sea Grant College Program, J A Marcy, University of Arkansas, USA*
- Introduction
- Current technologies available for muscle food industry tracing systems
- Traceability in livestock production
- Traceability in poultry production
- Traceability of seafood
- Traceability of meat, poultry and seafood products
- Electronic identification (EID)
- Future trends
Labelling of meat, poultry, seafood and their products in the EU
M Woolfe, Food Standards Agency - Retired, UK
- Introduction
- General (horizontal) food labelling requirements
- Origin, assurance and “eco-labelling” schemes
- Specific (vertical) requirements for raw meat and minced meat labelling
- Specific (vertical) requirements for poultry meat labelling
- Specific (vertical) labelling of meat and poultry products
- Specific (vertical) labelling of fish and shellfish
- Specific (vertical) labelling of fish and shellfish products
- Future trends
- Acknowledgements
- Sources of further information and advice
- References

Food packaging laws and regulation with particular emphasis on meat, poultry and fish
F Moran, School of Food Science and Environmental Health, Dublin Institute of Technology, Ireland
- Introduction to food contact material legislation
- The regulation of food contact materials in the European Union (EU)
- EU legislation on specific materials
- Other specific measures of importance
- The regulation of food contact materials in the United States of America
- Exemptions to the regulations
- The food contact notification system
- Future trends in legislation
- Sources of further information and advice
- References