PART 1 UNDERSTANDING MEAT QUALITY

Trends in meat consumption and the need for fresh meat and meat products of improved quality
M D Aaslyng, Danish Meat Research Institute, Denmark
- Introduction
- Eating meat for pleasure
- Eating meat for nutrition
- Variability in meat and meat products
- Future trends
- Acknowledgement
- References

Biology and regulation of carcass composition
P L Greenwood, NSW Department of Primary Industries and F Dunshea, University of Melbourne, Australia
- Introduction
- Patterns of growth of carcass tissues
- Biology of carcass tissue development and growth
- Consequences of prenatal and postnatal growth and development for carcass composition and meat quality
- Influences of metabolic modifiers on carcass characteristics
- Genotypic influences on carcass composition
- Future perspectives
- Sources of further information and advice
- References

Fresh meat texture and tenderness
D A King, T L Wheeler, S D Shackelford and M Koohmaraie, U.S. Meat Animal Research Center, USA
- Introduction
- Muscle constituents and structure contributing to tenderness variation
- Antemortem factors affecting meat tenderness
- Postmortem technologies affecting meat tenderness
- Laboratory tenderness assessments
- On-line tenderness prediction
- Conclusions
- Sources of further information and advice
- References

Meat color
R A Mancini, University of Connecticut, USA
- Introduction
- Myoglobin chemistry
- Antemortem factors affecting meat color
- Laboratory analysis of meat color
- Postmortem factors affecting meat color
- Product enhancement
- New developments and new areas of research
- Future directions
- Conclusion
- Sources of further information and advice
- References

Flavour development in meat
J S Elmore and D S Mottram, University of Reading, UK
- Introduction
- Flavour formation in meat
- Dietary effects on meat flavour
- Other pre-slaughter factors affecting meat flavour
- Postslaughter factors affecting meat flavour
- Off-flavours in meat
- Laboratory analysis of meat aroma compounds
- Future trends
- Sources of further information and advice
- References

**Fresh meat water-holding capacity**

*E Huff-Lonergan, Iowa State University, USA*

- Introduction
- Water-holding capacity defined
- Inherent factors in postmortem muscle that influence water-holding capacity
- Ante and early postmortem factors that influence water-holding capacity
- Future trends
- Sources of further information and advice
- References

**The nutritional quality of meat**

*H K Biesalski and D Nohr, University of Hohenheim, Germany*

- Introduction
- Macronutrients in meat
- Meat micronutrients
- Laboratory analysis of the nutritional quality of meat
- Future trends
- Conclusions
- Sources of further information and advice
- References

**Sensory evaluation of fresh meat**

*M G O'Sullivan and J P Kerry, University College Cork, Ireland*

- Introduction
- Sensory evaluation of meat colour
- Sensory evaluation of meat flavour
- Sensory assessment of meat tenderness
- Future trends
- References

**PART 2 IMPROVING THE QUALITY OF FRESH MEAT: GENETIC AND GENOMIC TECHNOLOGIES**

**New insights into the biology of meat quality from genomic and proteomic perspectives with particular emphasis on beef**

*A M Mullen, L Pannier and R Hamill, Ashtown Food Research Centre, Teagasc, Ireland*

- Introduction
- Genetic markers
- Functional genomics
- Proteomics
- Summary
- Acknowledgements
- References
Genetic and genomic approaches to improving pork quality
M T Cairns, NUI Galway, Ireland
- The importance of genetic and genomic approaches in improving pork quality
- Progress with identifying genes responsible for meat quality traits in pigs
- Functional genomics and improving pork quality
- Proteomics and improving pork quality
- Quantitative trait loci analysis and improving pork quality
- Future trends
- Sources of further information and advice
- References

Genetic and genomic approaches to improving sheep meat quality
C S Bishop and E Karamichou, The Roslin Institute and R (D) Sus University of Edinburgh, UK
- Introduction
- Genetic variation in sheep meat quality
- Genes impacting on meat quality
- Quantitative trait loci approaches to improving meat quality
- The contribution of functional genomics
- Future trends
- Acknowledgements
- References

Use of meat quality information in breeding programmes
G Simm, N Lambe, L Bünger, E Navajas and R Roehe, Scottish Agricultural College (SAC), UK
- Introduction
- Issues affecting the inclusion of meat quality information in breeding programmes
- Breeding programme design to include meat quality (MQ) goals
- Techniques for measuring meat quality
- Future trends
- Sources of further information and advice
- References

Genetic based diagnostic tools for predicting meat quality
W Barendse, CSIRO Livestock Industries, Australia
- Introduction: the need for better methods to predict meat quality
- Developing genetic-based diagnostic tests for predicting meat quality
- Current status of development and future potential
- Future trends
- Sources of further information and advice
- Acknowledgements
- References

PART 3 IMPROVING THE QUALITY OF FRESH MEAT: PRODUCTION STRATEGIES

Optimising the nutritional profile of beef
K Nuernberg, Research Institute of the Biology of Farm Animals, Germany
- Introduction: the potential to improve the nutritional profile of beef
- Optimising the nutritional profile of beef
- Optimising the quantity of vitamins and micronutrients in beef
- Future trends and conclusions
- References
Optimising the nutritional and sensorial profile of pork

J Mourot, INRA, France

- Introduction
- Pork composition
- The sensorial qualities of pork
- Effects of breeding factors on meat sensorial and nutritional qualities
- Orientation of pig production
- Conclusions
- References

Using antioxidants and nutraceuticals as dietary supplements to improve the quality and shelf-life of fresh meat

M N O’Grady and J P Kerry, University College Cork, Ireland

- Introduction
- Factors affecting fresh meat quality and shelf-life: appearance (colour), lipid oxidation and microbiology
- Chemistry and structure of vitamin E
- Chemistry and structure of green tea catechins
- Chemistry and structure of grape seed extract and bearberry compounds
- Chemistry and structure of oregano and rosemary compounds
- Conclusions
- References

Organic meat quality

A Braghieri and F Napolitano, Università degli Studi della Basilicata, Italy

- Introduction
- The quality of organic meats as compared to conventional products
- Safety and healthiness of organic meat
- Future trends
- Sources of further information and advice
- Acknowledgement
- References

Improving the quality of meat from ratites

K McMillin, Louisiana State University Agricultural Center, USA and L Hoffman, Stellenbosch University, South Africa

- Introduction
- Ratite meat industries
- Body and carcass quality traits
- Influences on composition and quality development
- Raw chilled ratite meat characteristics
- Value added products from ostrich meat
- Future trends
- Conclusions and sources of further information
- Sources of further information and advice
- References

Improving the meat quality of venison and other exotic game

L Hoffman, Stellenbosch University, South Africa and K McMillin, Louisiana State University Agricultural Center, USA

- Introduction
- Improving meat quality by means of production system
- Transport, lairage and slaughtering techniques
- Post mortem intervention to improve the meat quality
- Improving or maintaining the meat quality post mortem
- Value added products as a means to improve the quality attributes of exotic meats
PART 4 IMPROVING THE QUALITY OF FRESH MEAT: PROCESSING STRATEGIES

Automated grading of beef carcasses
P Allen, Ashtown Food Research Centre, Teagase, Ireland
- Introduction
- The purpose of carcass grading
- Carcass grading based on visual assessment
- Development and application of automated methods: vide image analysis (VIA)
- Future trends
- Sources of further information and advice
- References

Determining the lean content of pork carcasses
C Pomar and M Marcoux, Agriculture and Agri-Food Canada, Canada, M Gispert and M Font i Furnols, IRTA, Spain and G Daumas, IFIP Institut du Porc, France
- Introduction
- Determination of carcass lean yield
- The on-line determination of carcass composition and lean yield
- Current technologies available to accurately determine carcass composition and lean yield
- The limits of current technologies for estimating carcass composition and carcass value
- Future trends
- Conclusions
- References

New methods for analysis of factors affecting meat eating quality
V H Segtnan, K I Hildrum and J P Wold, Nofima Food, Matforsk AS, Norway
- Introduction
- Meat industry needs for on-line spectroscopic analysis
- Selected on-line spectroscopic techniques for meat
- Problems and pit-falls in on-line spectroscopic analysis
- Sources of further information and advice and future trends
- References

Chilling and freezing of meat and its effect on meat quality
S J James and C James, University of Bristol, UK
- Introduction
- The effect of chilling and freezing on meat tenderness and texture
- The effect of chilling and freezing on drip production
- The effect of chilling and freezing on meat colour and appearance
- Future trends
- Sources of further information and advice
- References

Carcass interventions and meat tenderness
M M Farouk, E Wiklund and K Rosenvold, AgResearch MIRINZ, New Zealand
- Introduction
- Whole-carcass interventions to improve tenderness
- Ageing of meat to improve tenderness
- Novel technologies to improve tenderness
- Processing techniques to improve tenderness of individual muscles/cuts
- Future trends
Sensory and quality properties of packaged meat
M G O'Sullivan and J P Kerry, University College Cork, Ireland
- Introduction
- Packaged meat
- Colour changes and packaged meat
- Lipid oxidation and packaged meat
- Catalysis of lipid oxidation
- Tenderness and packaged meat
- Future trends
- References

Characterizing muscle properties to develop muscle-specific intervention strategies and improve meat cuts for the consumer
C D Calkins, University of Nebraska and D D Johnson, University of Florida, USA
- Introduction
- Overview of U.S
- beef muscle profiling projects
- Methods
- Optimization
- Future trends
- Sources of further information and advice
- References

Animal welfare and meat quality
J Hartung, B Nowak and A Springorum, University of Veterinary Medicine Hanover, Germany
- Introduction
- Definition of animal welfare
- Meat quality traits
- Impact of housing and management on meat quality
- Impact of transport and lairage on meat quality
- Impact of stunning on animals and meat condition
- A risk assessment approach for animal welfare and meat quality in slaughter animals
- Conclusions
- Future trends
- References