PART 1 OXIDATION IN FOODS AND BEVERAGES

Understanding oxidation processes in foods
L H Skibsted, University of Copenhagen, Denmark
- Introduction
- Reactive oxygen and nitrogen species
- Evolution of antioxidants
- Lipid phase oxidations
- Aqueous phase oxidations
- Antioxidants and antireductants
- Future trends
- References

Metals and food oxidation
J Kanner, ARO Volcani Center, Israel
- Introduction
- Sources of metal ions and products particularly affected
- Mechanism of metal oxidation in biological systems and food
- Metal catalyzed oxidation in beverages
- Metal catalyzed oxidation in dehydrated foods
- Metal catalyzed oxidation in muscle foods
- Future trends
- References

The impact of singlet oxygen on lipid oxidation in foods
S Van Dyck, Kemin Agrifoods and University of Antwerp, Belgium
- Introduction
- Properties of singlet oxygen
- Impact of singlet oxygen on quality reduction in foods
- Micro-ingredients in food and singlet oxygen
- Vitamin loss in foods due to singlet oxygen
- Prevention of singlet oxidation
- Future trends
- Sources of further information and advice
- References

Heme proteins and oxidation in fresh and processed meats
M P Richards, University of Wisconsin-Madison, USA
- Introduction
- Quality implications of oxidation in fresh and processed meats
- Meat products particularly affected by oxidation
- Quantities of hemoglobin (Hb) and myoglobin (Mb) in muscle and structural characteristics
- Discoloration in meat products
- Lipid oxidation in meat products
- Inhibition of Hb and Mb mediated quality deterioration in meat products
- Inhibiting pigment and lipid oxidation in a commercial product
- Future trends
- Sources of further information and advice
- References

Lipoxygenase and lipid oxidation in foods
T Wang and E G Hammond, Iowa State University, USA
- The lipoxygenase (LOX) enzymes
- Mechanism of LOX catalyzed oxidation
- Sources of lipoxygenase and products particularly affected
Understanding and reducing oxidative flavour deterioration in foods
C Jacobsen, Technical University of Denmark, Denmark
- Introduction
- Evaluation of oxidative flavour deterioration of foods
- Oxidation and food flavour
- Conclusions
- Future trends
- Sources of further information and advice
- References

Health aspects of oxidized dietary fats
K Eder and R Ringseis, Technical University of Munich, Germany
- Introduction
- Nutritional quality loss of dietary fats during oxidation
- Loss of non-nutritive components during oxidation
- Formation of lipid peroxides in dietary fats during oxidation
- Bioavailability of lipid oxidation products
- Health-related effects of oxidized fats
- Future trends
- References

Methods to determine the extent of lipid oxidation in foods
A Kamal Eldin, Swedish University of Agricultural Sciences, Sweden
- Introduction
- Volumetric methods
- Spectroscopic methods
- Chromatographic methods
- Sensory analysis and correlation between sensory and instrumental analyses
- Research methods to study oxidation in foods and beverages
- Future trends
- Sources of further information and advice
- References

Methods for food shelf life determination and prediction
L Manzocco, S Calligaris and M C Nicoli, University of Udine, Italy
- Introduction
- Shelf life assessment strategies
- Definition of acceptability limit
- Identification of oxidative indicators
- Shelf life testing
- Future trends
- Sources of further information and advice
- References

PART 2 ANTIOXIDANTS IN FOODS AND BEVERAGES

Understanding antioxidant mechanisms in preventing oxidation in foods
E A Decker, B Chen and A Panya, University of Massachusetts, Amherst and R J Elias, The Pennsylvania State University, USA
- Introduction
- Inactivation of free radicals
- Metal chelation
- Control of reactive oxygen species
- Control of other prooxidative factors
- Antioxidant interactions
- Conclusions
- References

Protein antioxidants for the stabilisation of lipid foods: current and potential applications
R J Elias, The Pennsylvania State University, USA
- Introduction
- Important antioxidant enzymes
- Metal chelation
- Non-specific protein antioxidant mechanisms
- Food applications of protein antioxidant methods
- Consequences of protein oxidation
- Future trends
- References

Synthetic and natural antioxidant additives in food stabilization: current applications and future research
D R Berdahl, R N Nahas and J P Barren, Kalsec® Inc., USA
- Introduction
- Reviews of antioxidant use in foods
- Background
- Synthetic antioxidants and food applications
- Natural antioxidants and food applications
- What can we learn from the plastics industry? Conclusion
- References

Effects of food structure and ingredient interactions on antioxidant capacity
M H Gordon, University of Reading, UK
- Introduction
- Food structure
- Effect of nature of the lipids and the medium
- Interactions of antioxidants with other components
- Implications
- Future trends
- Sources of further information and advice
- References

Assessing the activity of natural food antioxidants
M Z Tsimidou and N Nenadis, Aristotle University of Thessaloniki, Greece
- Overview
- Assessment of individual compounds
- Radical scavenging
- Theoretical prediction
- Assays using radicals of biological relevance
- Assays using synthetic radicals
- Assays using radicals derived from lipid oxidation
- Other methods
- Assessment of mixture of compounds
- On line chemical characterization and assessment of antioxidants present in complex mixtures
- Epilogue
- Sources of further information and advice
Effects of processing and storage on antioxidant efficacy in foods
J Pokorny, Institute of Chemical Technology, Czech republic and Š Schmidt, Slovak Technical University, Slovakia

- Introduction
- Chemistry of changes of antioxidants
- Changes of antioxidant functionality during isolation from seeds
- Changes of antioxidant functionality during oil processing
- Changes during culinary operations at ambient and low temperatures
- Changes of antioxidant during heating
- Changes of antioxidant functionality during drying
- Safety aspects of antioxidant changes in foods
- Future trends
- Literature for further study
- References