PART 1 WINEMAKING TECHNOLOGIES AND WINE QUALITY

Yeast and fermentation management for improved wine quality
G Specht, Lallemand, USA
- Introduction
- Yeast and fermentation management and wine quality
- Yeast rehydration and handling
- Yeast inoculation
- Yeast inoculation rate
- Yeast inoculation timing
- Sequential yeast inoculation strategies
- Yeast storage
- Nutrient strategies
- Difficult fermentation conditions
- Sulphur compounds and their management
- Preventing stuck and sluggish fermentations
- Restarting stuck and sluggish fermentations
- Conclusion
- Acknowledgements
- References

Metabolic engineering of wine yeast and advances in yeast selection methods for improved wine quality
B Divol and F F Bauer, Stellenbosch University, South Africa
- Introduction
- Improving wine yeasts: current targets
- A systems biology approach to wine yeast studies
- Biotechnology, systems biology and the generation of new yeast strains
- Molecular biology and systems biology in the identification of wine yeasts
- Future trends
- References

Effects of malolactic fermentation on wine quality
A Lonvaud-Funel, University Victor Segalen Bordeaux II, France
- Introduction
- Spontaneous growth of lactic acid bacteria in wine
- Variations in the diversity of lactic acid bacteria species during winemaking
- Lactic acid bacteria and improving wine quality
- Lactic acid bacteria and wine spoilage: undesirable lactic acid bacteria strains
- Controlling malolactic fermentation by malolactic starters
- Conclusions and future trends
- References

Enzymes and wine quality
R-M Canal-Llaubères, Novozymes, France
- Introduction
- Definitions and production methods
- Regulatory aspects
- Enzyme applications in winemaking
- Advances in enzyme discovery
- Enzyme use in pre-fermentation stages
- Enzyme use in post fermentation stages
- Monitoring enzyme performance
- Future trends
- Conclusions
- Acknowledgements
- Sources of further information
- References

**Membrane and other techniques for the management of wine composition**

*D Wollan, Memstar Pty Ltd, Australia*

- Introduction
- Some caveats
- Some perspective – convention and intervention
- Next generation tools – phase change techniques
- Membrane separation techniques
- Membrane separation treatment and recombination
- Volatile acidity removal
- The problem of excess alcohol
- Taint removal
- Ultrafiltration
- Electro dialysis
- References

**Ageing on lees (sur lies) and the use of speciality inactive yeasts during wine fermentation**

*C Charpentier, Université de Bourgogne, France*

- Introduction
- Definition and composition of lees
- Yeast autolysis
- Ageing of white wines on lees
- Ageing of red wines on lees
- Ageing of sparkling wines
- Removal of undesirable compounds from wine
- Yeast specialities mimicking lees
- Conclusions
- References

**New directions in stabilization, clarification and fining of white wines**

*R Marchal, University of Rheims, France and E J Waters, The Australian Wine Research Institute, Australia*

- Introduction
- White wines, proteins and haze
- The origin of wine proteins
- Characterization of wine proteins
- Protein levels in white wines
- Protein haze formation in wine
- Bentonite fining
- Use of gelatin in white wine fining
- Wine fining with plant proteins
- Must clarification using the flotation technique
- Other fining agents
- Equipment for the addition of fining agents to wine
- Wine fining: general conclusion and practical recommendations
- Acknowledgements
- References

**Micro-oxygenation, oak alternatives and added tannins and wine quality**

*W J du Toit, Stellenbosch University, South Africa*

- Introduction
- Basic oxidation reactions and substrates of oxidation in wine
- Basic phenolic reactions in red wine involving oxygen
- When does oxygen come into contact with wine? Microoxygenation
- Recent microoxygenation research at the Department of Viticulture and Oenology, Stellenbosch University
- A few recommendations when using microoxygenation
- Alternative oak treatments
- Exogenous tannins in winemaking
- Future trends
- References

**Alternatives to cork in wine bottle closures**
*J Goode, Novartis, UK*
- Introduction
- The key property of closures: oxygen transmission
- The various closure types
- Conclusions and future trends
- References

**Current issues in organic winemaking: consumer expectations, producer attitudes and oenological innovation**
*D Rauhut, Forschungsanstalt Geisenheim (Geisenheim Research Center (GRC)), Germany and C Micheloni, AIAB – Italian Association for Organic Agriculture, Italy*
- Introduction
- Organic wine: a synthesis attempt
- Harmonisation process
- Future trends
- Acknowledgements
- References

**PART 2 MANAGING WINE SENSORY QUALITY**

**Yeast selection for wine flavour modulation**
*P Marullo, SARCO Laffort Inc., and D Dubourdieu, INRA-Université Bordeaux, France*
- Introduction
- Key issues in efficient wine yeast selection
- Selection of natural yeast isolates: methods and limits
- Metabolic engineering
- Conventional genetic strategies
- Mixed cultures as an alternative strategy
- Yeast by-products affecting wine aromas: glycerol
- Yeast by-products affecting wine aromas: acetic acid
- Yeast by-products affecting wine aromas: hydrogen sulphide
- Yeast by-products affecting wine aromas: higher alcohols
- Yeast by-products affecting wine aromas: esters
- Varietal aromas resulting from grape precursor biotransformation
- Conclusions and future trends
- References

**Brettanomyces/Dekkera off-flavours and other wine faults associated with microbial spoilage**
*L Conterno, Istituto Agrario San Michele, Italy and T Henick-Kling, Washington State University, USA*
- Introduction
- Brettanomyces/Dekkera off-flavours and their related metabolism
- Brettanomyces/Dekkera taxonomy and phylogenetic relationships with other wine yeasts
- Brettanomyces/Dekkera physiology
Reducing cork taint in wine
R Jung and V Schaefe, Forschungsanstalt Geisenheim, (Geisingen Research Center (GRC), Germany
- Introduction: cork taint
- Compounds causing musty mouldy off-flavours
- Quality management and control methods for wine corks: introduction
- Test procedures to evaluate the quality of cork stoppers
- Standard test procedures
- Additional test procedures
- Handling and processing of corks and bottles during bottling and storage
- Prevention of musty-mouldy off-flavours in the cellar environment
- Methods to reduce musty off flavours in contaminated wines
- References

Ladybug (Coccinellidae) taint in wine
A Botezatu and G Pickering, Brock University, Canada
- Introduction
- Quality implications
- Causal compounds
- Threshold and tolerances
- Other Coccinellidae species
- Post-harvest prevention and remediation
- Conclusion and future trends
- Abbreviations
- References

Understanding and controlling non-enzymatic wine oxidation
P A Kilmartin, The University of Auckland, New Zealand
- Introduction
- Oxygen in wine
- Polyphenol oxidation
- Oxidition of aroma compounds
- Measures of wine oxidation status
- White wine oxidation
- Red wine oxidation
- Influence of wine antioxidants
- Conclusion
- References

Ageing and flavour deterioration in wine
A W Linsenmeier, D Rauhut and W R Sponholz, Geisenheim Research Center, Germany
- Introduction: ageing
- Sensory changes during storage/ageing
- Aromatic compounds related to flavour deterioration
- Chemical reactions of ageing
- Factors influencing the ageing process and future trends in research
- Untypical ageing (UTA) off-flavours
- References
Biogenic amines and the winemaking process
M V Moreno-Arribas, Institute of Industrial Fermentations (CSIC), Spain, A Y Smit and M du Toit, Stellenbosch University, South Africa
- Introduction
- Incidence of biogenic amines in wines and health effects
- Formation of biogenic amines during the winemaking process
- Methods of detection and quantification of biogenic amines in wines
- Methods and tools to prevent the presence of biogenic amines in wines
- Future trends
- References

Managing the quality of icewines
A J Bowen, Brock University, Canada
- Introduction
- Definitions of icewine
- Viticulture
- Harvest considerations
- Oenology
- Chemical analysis of icewines
- Sensory properties of icewine
- Authentication
- Future trends
- References

Managing the quality of sparkling wines
S Buxaderas and E Lopez-Tamames, University of Barcelona, Spain
- Types of sparkling wines: definitions and characteristics
- Description of the organoleptic characteristics of sparkling wines
- Factors affecting sensory quality
- Quality control
- Conclusions
- References

Extraction technologies and wine quality
A Razungles, Montpellier Supagro, France
- Introduction
- Extraction factors
- Techniques applied to white wine vinification
- Techniques applied to rosé wine vinification
- Techniques applied to traditional red wine vinification
- Very hot short maceration applied to red wine vinification
- Vinification of red wines by carbonic maceration
- Traditional vinification of red wines with whole berries
- Draining and pressing
- Conclusion
- References