

Journal of the Science of Food and Agriculture, 2009, Volume 89, Number 5, pag. 765-773

Relation between chemical composition of oak wood used in cooperage and sensory perception of model extracts

**Prida Andrei, Heymann Hildegard,
Balanuta Anatol, Puech Jean-Louis**

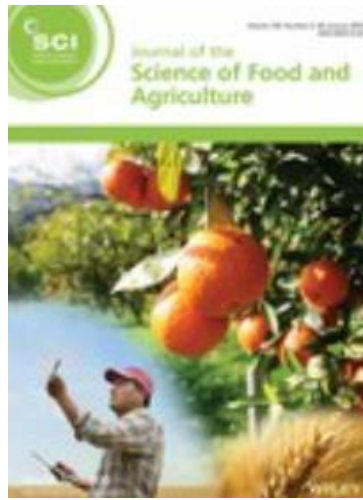
<https://doi.org/10.1002/jsfa.3510>

Abstract

BACKGROUND: Oak extractive substances modify the aroma and taste of 'oaked' wines, with an increased intensity of sensory descriptors such as 'oaky', 'spicy', 'vanilla', 'smoky', etc. arising during barrel maturation. In this study the relationship between the chemical composition of untoasted oak wood and the sensory assessment of oak extract was investigated. Oak wood samples (140) were analysed both chemically (using gas chromatography/mass spectrometry after extraction with dichloromethane) and using sensory descriptive analysis of oak-extracted model wine solutions.

RESULTS: Oak samples from the USA, France and Eastern Europe had different chemical compositions in terms of principal odour-active extractives, and this was reflected by perceived sensory differences.

CONCLUSION: The major sensory differences were associated with cis-whisky-lactone concentrations of the wood extracts and were related to



Journal of the Science of Food and Agriculture, 2009, Volume 89, Number 5, pag. 765-773

sensory descriptors such as coconut, caramel and milk. Other compounds studied (trans-whisky-lactone, eugenol and vanillin) were found to have a minor impact on sensory differences between samples in spite of their odour activity. This fact could be explained by the natural differences between samples not being sufficiently large to be perceived. The effects of aroma amplification and/or masking linked to the presence of other odorous chemicals could also explain these observations.