



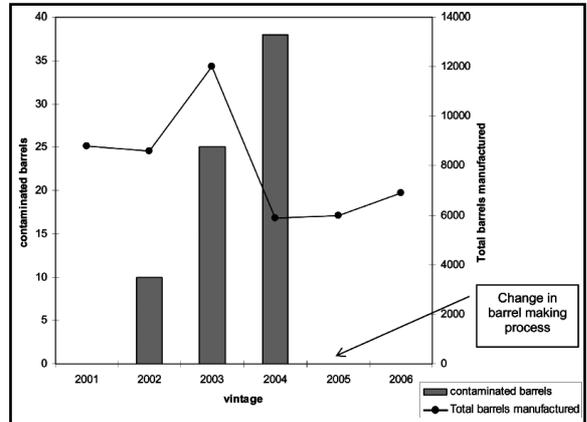
# Winetech Scan

Wine Industry Network of Expertise and Technology  
Netwerk van Kundigheid en Technologie vir die Wynbedryf

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## Research News

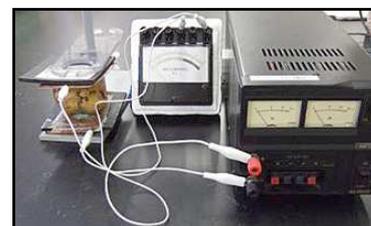
- It has become clear that 'cork taint' can also affect oak wood, and thus oak barrels. 2,4,6-trichloroanisole (TCA) is responsible for the taint, and usually results when naturally-occurring airborne fungi are presented with chlorophenol compounds, which they then convert into TCA. The primary chemical precursor to TCA is TCP (2,4,6-Trichlorophenol), an anti-microbial agent used in processing wood. TCA affects staves in the same barrel very sporadically, with extremely limited contaminated areas on the surface that may reach several millimetres in depth. The precise origin of the TCP and TCA in oak wood is not known at this stage. Available data indicate that the phase where stave wood is naturally dried and seasoned is the source of these undesirable organochlorine contaminants. The extent of this problem is still severely underestimated by coopers and barrel-users, due to the extremely unpredictable and localized contamination. Analysis of incidents involving spoiled wine (mainly red) by barrel taint around the world (France, South Africa, Italy, Australia, USA, and Austria) revealed TCA contamination that was strictly attributable to the barrels used. TCA contamination in barrels is extremely sporadic. Only a few barrels are likely to be affected in a given production batch, made from a single batch of stave wood. Furthermore, contamination does not affect entire batches of stave wood, but only a few staves, and possibly only a very limited fraction of their surface. Over a four-year period, from 2002 to 2006, a French cooperage, whose oak barrels were always the same type and manufactured in the same way, received complaints concerning 0.15% of their production, following excessive TCA contamination in the wines aged in them. This situation led to a 50% loss of sales, due to doubts concerning the quality of their barrels (right). Major changes in the production system and quality-control put an end to the complaints in 2005, but there was only a slow recovery in sales. <http://pubs.acs.org/doi/abs/10.1021/jf102571v>
- Oxidation of white wines by molecular oxygen and consequent loss of their characteristic aroma as well as browning constitute a serious problem in winemaking. Wine contains antioxidants such as phenolics, glutathione (GSH), ascorbic acid and sulphur dioxide (SO<sub>2</sub>); the relationships among these components appear to be crucial in wine resistance to oxidation. The role of GSH as an oxidative buffer is receiving considerable attention. Added to Sauvignon wine during the bottling process, GSH prevents the yellow shading of colour, the dissipation of the varietal aroma and the wine tendency to develop ageing defects. Now the glutathione (GSH) content and other physicochemical parameters of thirteen white wines originating from Lebanon were studied in relation to their browning capacity. Statistical analysis of the data obtained showed that the main contributors to the wine browning were pH, total phenols and total SO<sub>2</sub>. No significant correlation was found between browning and GSH content. The effect of GSH, added to the wine at different concentrations, on the total phenol content was studied at 55°C during 8 days of accelerated oxidation. GSH addition resulted in significantly higher total phenol content only on day 0 of the test. GSH was shown to be readily oxidised in these conditions: even on day 0, there was a considerable reduction (up to 73%) in GSH level. After 8 days of oxidation, GSH concentration in all studied samples was close to initial GSH values in the control wine (without added GSH). However, GSH appeared to contribute significantly to wine stability, which might have been via the increase of reduced phenolic pool. GSH also seemed to improve the organoleptic qualities of the wine. <http://dx.doi.org/10.1111/j.1365-2621.2009.02036.x>
- In recent years, winemaking additives based on inactive dry yeast (IDY) have been widely used within the enological industry. It has been claimed they can be used as alcoholic and malolactic fermentation enhancers, as protective agents to improve active dry yeast rehydration, or as organoleptic enhancers stabilizing the colour of red wines by using mannoprotein-rich IDY preparations. Inactive yeast, yeast autolysates, yeast extracts, and yeast hulls or walls can be included under the generic name of IDY preparations. Some of the compounds released during yeast autolysis (self-digestion) seem to be responsible for the great number of applications attributed to these preparations. However, scientific information about the chemistry behind their use and their action mode is still scarce. A study investigated the ability of six different commercial IDYs to release soluble compounds (high molecular-weight nitrogen, free amino nitrogen, peptidic nitrogen, free amino acids, and polysaccharides) into model wines, and the effect of the IDYs on the volatility of seven wine aroma compounds. Important differences in soluble compounds released into the model wines supplemented by the IDYs were found,



with the free amino acids being among the most released. The volatility of most of the seven aroma compounds was affected by the addition of IDY preparations at a concentration usually employed during winemaking. The extent of this effect was dependent on the physicochemical characteristics of the aroma compound and on the length of time the IDY preparations remained in contact with the model wines. Whereas shorter contact times (2 to 6 days) mainly promoted an increase in the volatility of the aroma compounds, longer exposure (9 and 13 days) provoked a retention effect, with the consequent reduction of aroma compounds in the headspace. Different commercial IDY preparations showed different effects toward the aroma compounds, not only because of the retention of aroma compounds in the insoluble matter present in these preparations but also due to differences in their ability to release soluble compounds into the wines. <http://dx.doi.org/10.1021/jf900904x>

- Syrah varietal wine is produced in the Northern Rhone and is often co-fermented with a proportion of Viognier, a practice also adopted in some other countries. Anecdotally, the benefits of co-fermentation include added complexity, better texture, increased aromatic character, improved colour and colour stability, leading to enhanced aging ability. To examine these anecdotal claims, anthocyanin-derived pigment profiles in a series of 100% *Vitis Vinifera* L Syrah and 2%, 5%, and 10% co-ferments with crushed destemmed *Vitis Vinifera* L Viognier were compared, using spectroscopic, protein precipitation and HPLC methods. The extent of co-pigmentation was highest in the younger wines and declined a month after fermentation and further for the year-old wines. Over the course of the study the control (Syrah only), was not consistently different in colour enhancement due to co-pigmentation than the Syrah co-fermented with Viognier. The concentrations of important co-factor classes, such as the flavonols, were decreased, rather than increased, through the addition of Viognier juice to a Syrah ferment. [www.infowine.com/default.asp?scheda=9571](http://www.infowine.com/default.asp?scheda=9571)

- Drought, bruising, and other stresses can stimulate the accumulation of beneficial phenolic compounds (antioxidants) in fresh produce. Japanese researchers report that stressing potatoes with ultrasound or electricity for 5 to 30 minutes increased the amounts of antioxidants, including phenols and chlorogenic acid, by as much as 50%. The ultrasound treatment consisted of immersing whole potatoes in water and subjecting them to ultrasound for 5 or 10 minutes. For the electrical treatment, the scientists immersed potatoes in a salt solution for 10 seconds and subsequently treated them with a electrical charge for 10, 20, and 30 minutes. The 5 minutes of ultrasound, for instance, increased polyphenol levels by 1.2 times and other antioxidants by about 1.6 times. The process could have widespread commercial application, due to growing consumer interest in so-called 'functional foods'. Those are products such as berries, nuts, chocolate, soy, and wine that may have health benefits beyond traditional nutrition. [www.physorg.com/news201528687.html](http://www.physorg.com/news201528687.html)



- Ischemia is a restriction in blood supply, with resultant damage to, or dysfunction of, tissue. Research has suggested that regular heavy alcohol consumption increases the risk for ischemic stroke, whereas frequent light to moderate alcohol intake may decrease the risk. However, the risk of ischemic stroke associated with transient exposure to alcohol has been unclear. Now a study of 390 patients has found that, compared with times when alcohol wasn't being used, the relative risk of stroke after alcohol consumption was: 2.3 times higher in the first hour; 1.6 times higher in the second hour; and 30% lower than baseline after 24 hours. The patterns remained the same whether participants had consumed wine, beer or distilled spirits. Just after drinking, blood pressure rises and blood platelets become stickier, which may increase the possibility of a clot forming. Consistent use of small amounts of alcohol is associated with beneficial changes in blood lipids and more flexible blood vessels, which may reduce risk overall. <http://stroke.ahajournals.org/cgi/content/full/41/9/1845>

## Local research news

- As a result of the expansion of the global wine market there is an increased awareness of the authenticity of wine. A number of European countries, as well as the USA, have mechanisms in place to test for wine authenticity, and it is possible that future EU regulations may require full authentication of imported wines and spirits before sale. A project having as its aim the creation of a database whereby the possible adulteration of local wine with ethanol, sugar, wine or water can be detected has been undertaken. The method chosen was that of measuring the isotope ratios of various elements in the wines. Adulteration of the wine causes a change in these isotope ratios. It was found that for adulteration by ethanol or sugar the  $^2\text{H}/^1\text{H}$  and  $^{13}\text{C}/^{12}\text{C}$  ratios in wine are relevant, while the addition of water affects the  $^{18}\text{O}/^{16}\text{O}$  ratio. All three ratios together can be used to establish the appellation (geographical indication) of the wines. Using the multi-isotopic approach and the isotopic authentic database constructed since the onset of the project as a base, commercial wines can be screened to ensure legality with regard to composition. Typically, unknown or suspicious commercial wines will be analysed isotopically by accredited laboratories, and the results compared to the authentic and/or unadulterated commercial databases. [www.sawislibrary.co.za/dbtextimages/finalreport148.pdf](http://www.sawislibrary.co.za/dbtextimages/finalreport148.pdf)

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