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WINE

Photo: Phil Carrick



Soft focus ... cork has been shown in a more favourable light.

Put a cork in it

New research findings are good news for supporters of the natural wine bottle sealer.

In the debate over how best to seal a bottle of wine without spoiling, cork's supporters have gained extra ammunition. New research indicates it does a better job than a previous study suggested.

Last year (*Good Living*, February 15) I reported on some research conducted by Hart & Kleinig on cork, which was funded as part of the Australian Closure Foundation and reported at a NSW Wine Press Club event. Its most controversial finding was that natural wine corks varied in their oxygen permeability by a factor of 1000. In other words, some corks let in 1000 times more air than others.

This seemed to give fuel to those in the wine industry who blamed cork for so-called random oxidation of wine, or what others call sporadic oxidation. That is, in any batch of cork-sealed wine – and it's especially noticeable in dry whites such as semillon and riesling – some bottles will be in perfect condition after, say, two years, others will show premature age and some will be oxidised to the point of being spoilt and unpalatable.

It has often been assumed that oxygen is necessary for wine to age correctly, but there is little scientific evidence of this, or of how much oxygen is ideal. The oxygen

permeability of the cork or plastic or metal cap is clearly an important factor.

Now, further research has been published that reaches quite different conclusions from Hart & Kleinig. It paints natural cork's ability to seal bottles of wine in a much more favourable light.

Whereas Hart & Kleinig reported oxygen ingress rates of between 1 and .001 cubic centimetres a day, the latest work, published in the *Journal of Agricultural and Food Chemistry* by Paulo Lopes et al, from the University of Bordeaux, finds a range of just .0005cc to .0044cc a day.

A key reason for this huge difference is the way the oxygen permeability of the cork was measured. Hart & Kleinig and other researchers used what is known as the Mocon method, which seems flawed: it measures oxygen movement through the dry cork, without insertion in a bottle and with no wine or other liquid involved. In other words, it's not a real-life example.

On the other hand, Lopes and his colleagues used a method of their own devising that they believe is more akin to the reality of cork stoppers and wine stored in glass bottles.

If you think about it, Hart & Kleinig's conclusion seems a bit far-fetched: are we to believe that 1cc of oxygen enters a 750cc bottle full of wine every day? At that rate, it would take little more than two years for the entire volume of wine in the bottle to be displaced by oxygen. And, if my memory serves me, the number of corks sampled by Hart & Kleinig was tiny, possibly even too small to be statistically significant.

Incidentally, a recent paper published by Godden et al from the Australian Wine Research Institute reported oxygen permeability rates in natural cork of between .0001cc and .1227cc a day – higher than Lopes et al but much lower than Hart & Kleinig's results.

A side benefit to the cork industry of the Lopes research has to do with reductive or sulfidic off-characters. One of the counter-arguments of the cork supporters is that screwcaps are so low in oxygen permeability that they promote reductive conditions inside the bottle of wine. This can result in rubbery or struck-flint sulfide-like aromas, which even in tiny quantities can adversely affect the aroma and taste of delicate unwooded white wines such as riesling and semillon. The screwcap proponents reply that they would rather have a trace of sulfide in a small percentage of wines than 6 per cent (choose your own number) of bottles totally ruined by cork taint or sporadic oxidation.

The good news for cork producers is that the various researchers are in agreement that natural cork has a medium level of oxygen permeability, while screwcaps are low and synthetic stoppers are high. This means sulfide-like odours are less likely to form after bottling.

Another interesting finding of Lopes and other recent researchers is that it doesn't make any difference if you store your bottles upright or lying down, at least for the first two years (some say five years) after the cork is inserted.