

Title: ' Of science and screwcaps '

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A solitary voice – an antipodean one of considerable reason – is emerging from the heartland of the screwcap revolution and is casting doubt on some of the arguments put forward by advocates of this form of closure. Science writer, Leonie Joubert reports.

Cork taint: that heart-dropping wet cardboard, miff and mildew on the nose which speaks of the ruination of that precious bottle of Château Exorbitant that you've had tucked away in your cellar for years, awaiting for the perfect show-off moment. Sulphite taint: a horrid, nose-tingling matchstick, fire cracker, rotten egg or even cabbage smell which cooks up inside a bottle of wine that has been sealed too tightly with a synthetic closure. Both faults strip away the nuanced fruit and velvety palate which some winemaker laboured over for many non-Union hours during harvest, packaging them up for your gastronomic pleasure.

Cork taint – delivered to your nose by a natural compound called TCA or trichloroanisole found in corks that aren't cleaned properly – is an old nemesis of the wine aficionado and has variously been blamed for fouling anything from 10 to 15 percent of wines these days (although the figure seems to fluctuate according to the degree of annoyance of the person delivering it).*

But the increasing occurrence of unpleasant sulphide characters on wine might be keeping pace with the increased use of screwcap closures – suggesting that the presence of the telltale 'reductive' characters in wine may not be the fault of sloppy winemaking but the inability of this type of synthetic closure to 'breathe' properly.

A solitary voice – an antipodean one of considerable reason – is emerging from the heartland of the screwcap revolution and is casting doubt on some of the arguments put forward by advocates of this form of closure.

Alan Limmer, New Zealand winemaker and owner of Stonecroft Wines, also holds a PhD in chemistry from Waikato University and has written extensively about the chemical changes which take place inside a bottle of wine once it is sealed up and shipped off to the dinner table.

The actual chemical equation gets a little complicated but the essence of his argument distils into this: the fermentation process through which grape juice must go in order to metamorphose into the glorious beverage we know and love leaves a 'sulphite fingerprint' in the wine. This is caused by a collection of compounds of sulphur whose exact makeup depends on the nutrient composition of the wine during fermentation and the yeast added by the winemaker.

Depending on how a wine is stored, natural chemical processes in the presence of a tiny amount of oxygen can shift a wine away from showing up this sulphite content. Or, if the bottle is closed with an impermeable seal which leaves the wine in an anaerobic environment, these foul 'reduced' characters develop and are trapped into the bottle, only to deliver that horrid pong upon turning the screw.

This sulphite pong was often blamed on faulty and sloppy winemaking, but increasingly even reputed winemakers are finding these smells turning up in the wines which are bottled under screwcap about a year to 18 months after closure.

Limmer, writing in the journal *Chemistry in New Zealand* in September 2005, says it's not the screwcap itself which causes the problem, but the airtight foil seal inside the lid of the closure which traps the wine in this oxygen-free space.

Firstly, he argues, the 'humble cork' is more permeable by air than many winemakers believe, allowing the bottled product to breathe ever so slightly, thus preventing the formation of post-bottling sulphides.

'Cork does have an ability to transmit oxygen at a slightly higher rate than screwcaps', he says, something which explains observations regarding how wines under screwcaps age more slowly than those under cork, and how the chemical shifts in a wine under screwcaps move towards the formation of post-bottling reduction.

Reporting in a *Harpers* supplement on closures in December 2005, Paul White interviewed respected New Zealand winemaker and senior wine judge, Kate Radburn from CJ Pask in Hawke's Bay. Radburn told White that after several years of bottling wines under screwcaps, she became increasingly unhappy with how the product developed over time. She said that wines she'd experienced through the 2005 judging season had shown greater reductive faults 'than before the advent of screwcap'. White wrote that this manifested 'clearly in the aromas, but more so now as bitterness at the back of the palate and a dulling of fruit'.

Limmer says that because the problem lies in the airtight foil seal inside the lid of the screwcap, an easy solution would be to make a slow-permeable membrane which would allow the closure to simulate the fractional breathing quality of cork. Until this sort of product is on the market, though, winemakers might want to treat screwcaps with a little more caution than proponents of the alternative closure might recommend.

* Research conducted during the 2006 International Wine Challenge judging found 2.2% of the total wines tasted to have had high sulphide faults relating to screwcaps and 2.8% of wines to have had cork taint. A further 1.6% of wines were classified as showing oxidation faults relating to cork, though this latter category doesn't distinguish between natural and synthetic cork. [Click here for more information.](#)