

# Good Lab Analysis

Sulfites and pH are related. When sulfites are added to wine, about half the amount binds with other wine compounds and about half exists free in solution. The bound sulfur dioxide doesn't inhibit microbes. Many winemakers therefore talk about "free" sulfur dioxide levels and keep their wines within certain ranges. The problem with only considering free sulfur dioxide is that there are three different forms with ratios that depend on pH. Sulfur dioxide in the molecular form is the one that inhibits microbes and is most prevalent at lower pH values. Fortunately yeast can handle pH levels that inhibit spoilage microbes. A guideline is to keep molecular sulfur dioxide — which is more important than free sulfur dioxide — around 0.5 to 0.8 grams per liter (ppm) for whites and 0.5 to 0.6 ppm for reds.

Because the molecular form of sulfur dioxide is pH dependent, good analysis is critical. If a winemaker wants 0.8 ppm of molecular sulfur dioxide, how important is pH?

To get 0.8 ppm molecular sulfur dioxide, the following FSO<sub>2</sub> is needed depending on wine pH:

<u>pH</u>	<u>FSO<sub>2</sub></u>
3.0	13 ppm
3.4	31 ppm
3.8	75 ppm

It is obvious your lab analysis must be accurate.

A survey done in 1999 showed commercial California winery labs were not uniform in their reported analytical results. As reported by C. E. Butzke and S. E. Ebeler in AJEV, 50:4:461-465 (1999) "Survey of Analytical Methods and Winery Laboratory Proficiency"

Results of a survey of methods of analysis for five basic measurements of wine composition (pH, titratable acidity, volatile acidity, ethanol, and residual sugar) used in commercial winery laboratories are reported. A laboratory proficiency test was conducted with cooperating wineries for the same measurements. The proficiency test showed satisfactory results for the analysis of pH and ethanol in wine with coefficients of variation between wineries of 1.2% and 1.8%, respectively. Less than 20% of the wineries were proficient in measuring titratable acidity or volatile acidity. The range of reported volatile acidity concentrations varied more than two-fold. The analysis for residual sugar yielded unsatisfactory results, with a coefficient of variation of 140% and reported values ranging from 0.01 to 4.0 g/L.

The results of this preliminary proficiency test suggested a need for improved laboratory quality management systems, especially with respect to analytical method standardization and validation, and for the establishment of proficiency testing program for American wineries. An "ASEV Winery Laboratory Quality Systems" CD-ROM was developed to guide wineries from the first steps of setting up a quality management system all the way to winery lab accreditation, and a continuous and frequent inter-laboratory proficiency testing scheme has been established.

The ASEV/CTS winery lab proficiency testing program can be found at

<http://asev.org/technical-projects/lab-proficiency-testing/>

and the Winery Lab Quality Systems CD at

<http://asev.org/technical-projects/winery-lab-quality-cd-rom/>

You can find these on my web site under LINKS. Go to:

<http://www.napavalley.edu/apps/comm.asp?Q=P958>

<http://asev.org/technical-projects/lab-proficiency-testing/>

<http://asev.org/technical-projects/winery-lab-quality-cd-rom/>