



Variability of tannin concentration in red wines

By: J. Harbertson, R. Hodgins, L. Thurston, L. Schaffer, M. Reid, J. London, C. Ross, and D. Adams

In: American Journal of Enology and Viticulture. 59(2):210-214. 2008

- To be able to establish the approximate tannin content of commercial red wines, these authors analyzed a large population of wines – 1325 wines, to be exact. These included:

- blends from Bordeaux (dominated by Cabernet and Merlot)
- Cabernet Sauvignons from Washington and California
- Merlots from Washington.
- Pinot noirs from Washington and California
- Syrahs from California, Washington and Australia, and
- Zinfandels from California.

- Tannins were measured with the Adams/Harbertson tannin assay, or UC Davis tannin assay (see Summaries #4, #28). Briefly, this assay is based on the precipitation of tannins with protein (BSA), followed by the reaction of tannins with ferric chloride to form a blue solution that absorbs at 510 nm and whose intensity is equivalent to the amount of tannins in the original sample.

- **Results.**

1) The mean tannin concentration was 544 mg/L catechin equivalents (CE). The standard deviation was very large – almost half the value of the mean. The distribution of tannins was not normal, but rather there was a high proportion of data on the right of the distribution, that is, there were more wines with higher tannin concentration than the mean than with lower concentration than the mean (this is called positive skew).

2) *Effect of variety.* All the varieties showed significant differences in the amount of tannins, with the exception of Cabernet and Zinfandel, which showed similar values. Still, the overlap across varieties was so large, that “tannin concentration” was not sufficient to identify the variety. The variety ranking of tannin concentrations, starting with the most tannic, was: Cabernet S. (672 mg/L CE) > Zinfandel (652 mg/L CE) > Merlot (559 mg/L CE) > Syrah (455 mg/L CE) > Pinot noir (348 mg/L CE)

3) *Effect of geographical origin.* Pinot noir from Oregon was more tannic –but not significantly so– than California Pinot noir. Washington Cabernet was as tannic as California Cabernet. California Syrahs were significantly more tannic than Washington and Australian Syrahs. Bordeaux wines were as tannic as U.S. Cabernets and Merlots.

The authors conclude that there is more variation in tannin concentrations of wine than previously thought. This variation is larger than the reported tannin variation in the fruit, suggesting that winemaking technique may play the largest role in a wine’s final tannin concentration – or simply be adding to the already-present viticulture variation. For an easy recipe to the UC Davis tannin assay, check:

<http://wineserver.ucdavis.edu/people/Faculty/adams/tannin/index.htm>