



Advances in wine technology are allowing winemakers to bring their wines to new heights.
Image Source: Unsplash user Thomas Martinsen

The winemaking process is typically associated more with centuries-old tradition than cutting-edge technology. For many of us, the process of creating wine is imagined to be almost a form of alchemy, a mysterious and magical transformation. But at the research winery at the University of California, Davis, wine experts are marrying time-honored winemaking techniques with the latest technological innovations to advance winemaking as both an art and a science.¹ Here, researchers investigate how state-of-the-art equipment can be used to perfect each stage of the winemaking process, from enhancing yields to optimizing flavor.

For many in the wine industry, the research winery is regarded as a new frontier and technologically-minded wine producers are eager to get in on the action. T.J. Rodgers, a long-time winemaker and CEO of Cypress Semiconductor Corp. recently donated 152 high-tech fermentation tanks to the UCD operation. Despite the fact that he still stomps his own grapes by foot, he believes that winemaking technology is the way forward. “I wanted to showcase how technology could transform winemaking,” he says. Meanwhile, Bill Murphy, chief executive of Clos LaChance Wines, calls the research winery “revolutionary.”

The desire to incorporate new winemaking technology in the wine production process is driven in part by the sharply rising demand for wine in the United States and the growing sophistication of wine consumers. By 2018, wine consumption in the US is projected to rise by 11% and growth is expected across all price points.² Meanwhile, specialized online wine shops like [Vinfolio](#) are increasing consumer knowledge and access to fine, rare, and collectible wines, allowing casual wine drinkers and connoisseurs alike to become both more discriminating and more adventurous in their wine choices. To enhance their products and meet consumer expectations, a growing number of wineries – both large and small – are establishing their own in-house wine labs to analyze their products and ensure quality. One of the most essential pieces of equipment for any wine laboratory is a spectrophotometer.



Spectrophotometric analysis allows winemakers to monitor wine performance and quality throughout the production process.

Image Source: Unsplash user Thomas Verbruggen

Spectrophotometric Wine Analysis

Spectrophotometers are a key component of modern winemaking technology that allows winemakers to gather invaluable information about critical product quality parameters and process variables. As Jean L. Jacobson writes in Wine Business Monthly:

During harvest and fermentation, these instruments are vital in providing winemakers with fast analysis results on which they base much of their decision making. Even the smallest winery will praise the benefits this piece of equipment can provide. The question isn't 'do we need a spectrophotometer' but rather 'which one do we need?'³

By incorporating spectrophotometers in your winery lab, you are able to rapidly and accurately analyze your product to ensure the highest level of quality control. Rather than relying on outside labs, you can gain the insight you need in-house, allowing you to test as many samples as you want to enhance your winemaking process, consistently monitor quality parameters, and avoid potential production problems.

Wine Color Analysis

Color is one of the most significant attributes affecting consumer perception; studies reveal that [the color of wine can override other sensory information](#) to deeply impact consumer experiences of a particular product. As such, monitoring the color of a finished wine is critical to ensuring that the appearance of the wine enhances consumers' sensory experiences and meets aesthetic expectations. But the function of wine color goes beyond aesthetics; it can be an important indication of age and quality, and monitoring the spectral absorbency of wines throughout the production process allows winemakers to determine whether a wine is performing as expected. Spectrophotometers are ideally suited for providing [spectral and colorimetric data](#) to ensure that a product is conforming to color expectations.

Chemical Analysis

The taste of a wine is the result of the complex interplay amongst chemical components and may be impacted by a host of factors, including grape variety, growing conditions, temperature, and length of aging. Spectrophotometric winemaking technology allows winemakers to perform advanced chemical analysis to gain a complete picture of the chemical composition of their products, including:

- Free amino concentration
- Malic acid concentration
- Ammonia concentration
- Phenolic component level
- Residual reducing sugar level
- [Alcohol content](#)

As Denise Gardner writes, “Following a wine’s chemistry through analytical tests provides a foundation for accurate records, knowledge on a potential wine problem, and the ability to watch chemistry trends in a specific variety.”⁴ Additionally, instrumental analysis takes [subjective sensory variability](#) out of the equation to create reliable, repeatable data that provides [an objective basis for quality assurance](#).

Advancing Wine Technology

HunterLab has been renowned for its spectrophotometric technologies for over 60 years and our ongoing commitment to innovation and technological excellence has made us a leader in the field of spectral analysis. Today, we offer a full range of portable, benchtop, and in-line spectrophotometers, giving wine producers the ability to obtain accurate spectral data in any environment and reducing reliance on external labs at a time when wineries are increasingly seeing the value of in-house laboratories. By incorporating spectrophotometric instrumentation in your winemaking process, you can continuously monitor your product for the highest level of insight and optimal quality control to meet the expectations of today’s sophisticated wine drinkers. [Contact us](#) to learn more about how HunterLab instrumentation can be a valuable addition to your wine lab and let us help you select the perfect tools for your winery.

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