

Measuring pH in Wine-Making

pH measures the quantity of acids present, the strength of the acids, and the effects of minerals and other ingredients in the wine. Wine pH depends on three main factors: the total amount of acid present, the ratio of malic acid to tartaric acid, and the amount of potassium present. Wines that contain little acid and excess potassium show high pH values. Wine with more tartaric acid, less malic acid, less potassium and more titratable acid has lower pH values.

pH values range from 2.9 to 4.2 in wine. Wine's chemical and biological stability are very dependent on pH value. Lower pH values are known to improve the stability, so winemakers usually prefer a pH range of 3.0 to 3.5. The wine is so stable in this range that many winemakers believe pH is a crucial guideline in wine-making.

There are many advantages to low pH values in wine. Low pH inhibits bacteria, causes sugar fermentation to progress more evenly and makes malolactic fermentation easier to control. Low pH also has a direct influence on the hot stability of wine. When bottled wines are stored in warm areas, protein precipitates out of them, causing serious problems. These wines are then treated with bentonite, which removes excess protein. pH is important to the treatment because bentonite successfully removes more protein when the pH value is low. If wine pH increases, bentonite is less effective, making it necessary to add larger amounts. The danger is adding too much bentonite because it can strip wines of their unique aromas and flavors.

Low wine pH results in better visual qualities as well. When pH is lower, both red and white wines maintain better color intensity. Red wines have more and better color and white wines do not brown as easily.

When wine has high pH values, bacteria grow rapidly and undesirable bacterial fermentation is more problematic. This condition causes less biological and chemical stability, and poorer color. Wines with a high pH always need more attention and greater care.

Refer to the table below as to the effects of pH levels on wine quality:

Wine Characteristic Low pH Range(3.0 - 3.4) High pH Range(3.6 - 4.0)		
Oxidation	Less	More
Amount of color	More	Less
Kind of color Yeast Fermentation	Ruby Unaffected	Browner Unaffected
Protein Stability Bacterial Growth	More stable Less	Less Stable More
Bacterial Fermentation	Less	More