Wine making is a romantic chemistry-based process. When selected grapes are processed in precise environments for a specific amount of time, the experience can be rewarding, both to the palate of those who enjoy this art and the highly talented wine makers. Below we describe just how many factors determine desirable and undesirable outcomes.

1. Fixed acidity: The fixed acids involved with wine making that do not evaporate readily. These acids such as Tartaric, Malic, Citric, and Succinic create the different tarts and sour levels which we experience when enjoying our favorite wine. These fluctuations in grapes are shaped by growing regions such as cool climates promoting too much acid development, differenced by fruit grown in warm climates generally containing too little acid.
2. Volatile acidity: The amounts of acetic acids in wine, which at too high of levels can lead to potential unpleasant vinegar taste; which in most cases can be due to processing failures since acids are fixed during the fermentation process.
3. Citric acid: Is found in small quantities around 5% but can add “freshness” and flavor to wines. Citric acid in excess quantities can be fermented into lactic acid, and some types of lactic bacteria can ferment citric acid into acetic acid (vinegar flavors). Excessive amounts of acetic acid are never desirable in wine, so the citric acid into acetic acid fermentation can be a serious problem.
4. Residual sugar: The amount of sugar remaining after fermentation stops. Grape sugars consist mostly of two monosaccharides, glucose and fructose, and these two simple sugars occur in about equal proportions.
5. Chlorides: The amount of salt in the wine. Chlorides, or the concentration of Chloride in wine. In many countries there are strict guidelines to amount of chloride by concentration allowed.
6. Free sulfur dioxide: The free form of SO2 exists in equilibrium between molecular SO2 (as a dissolved gas) and bisulfite ion, which prevents microbial growth and the oxidation of wine.
7. Total sulfur dioxide: Amount of free and bound forms of SO2. In low concentrations, SO2 is mostly undetectable in wine, but at free SO2 concentrations over 50 ppm, SO2 becomes evident in the nose and taste of wine
8. Density: The density of water is close to that of water depending on the percent of alcohol and sugar content.
9. PH: Describes how acidic or basic a wine is on a scale from 0 (very acidic) to 14 (very basic). Winemakers will often mention their pH as an indication of character, to point out whether a particular cuvée or batch or wine is energetic and fresh or more smooth and ripe. Acids have a pH less than 7.0 while bases have a pH higher than 7.0. Plain water measures 7.0. Most wines fall between 3.0 and 3.6.
10. Sulphates: A wine additive which can contribute to sulfur dioxide gas (S02) levels, which acts as an antimicrobial and antioxidant. Most table grapes also contain sulphates to help retain colors and freshness, which winemakers also follow to accomplish similar results with their wine.
11. Alcohol: The percent of alcohol content of the wine, which is obtained during the fermentation process.
12. Quality: The sensory data, median of at least 3 evaluations graded by wine experts between 0 (very bad) and 10 (very excellent).

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