Fixed Acidity in Wine

Acidity is a fundamental property of wine, imparting sourness and resistance to microbial infection.
Doug Nierman, 2004
UC Davis Waterhouse Lab:
Available at: http://waterhouse.ucdavis.edu/whats-in-wine/fixed-acidity

Acids are major wine constituents and contribute greatly to its taste. In fact, acids impart the sourness or tartness that is a fundamental feature in wine taste. Wines lacking in acid are "flat." Chemically the acids influence titrable acidity which affects taste and pH which affects color, stability to oxidation, and consequently the overall lifespan of a wine. The most abundant of these acids arise in the grapes themselves and carry over into the wine. However, there are also some acids that arise as a result of the fermentation process from either yeast and/or bacteria. Traditionally total acidity is divided into two groups, namely the volatile acids (see separate description) and the nonvolatile or fixed acids.

The predominant fixed acids found in wines are tartaric, malic, citric, and succinic. Their respective levels found in wine can vary greatly but in general one would expect to see 1,000 to 4,000 mg/L tartaric acid, 0 to 8,000 mg/L malic acid, 0 to 500 mg/L citric acid, and 500 to 2,000 mg/L succinic acid. All of these acids originate in grapes with the exception of succinic acid, which is produced by yeast during the fermentation process. Grapes also contain ascorbic acid (Vitamin C), but this is lost during fermentation. It is also legal to add fumaric acid as a preservative.

Wines produced from cool climate grapes are high in acidity and thus taste sour. These high-acid wines can be treated to reduce the acidity, either by neutralizing agents, or by malo-lactic fermentation. Warm climate grapes can be low in acid, more or less depending on variety. In these areas tartaric acid, recycled from winemaking, is added to increase acidity and prevent wines from being flat. Currently winemakers in California are pushing wines to high pH levels, as high as 4.0, while 20 years ago pH's above 3.6 were unusual. This makes wines taste softer, popular with wine writers today.