

Lifevine Wine 25% More Antioxidants

What is an antioxidant?

At their core, antioxidants are chemicals defined by their ability to inhibit or reverse oxidation. **Oxidation** refers to a process by which one molecule steals electrons from another molecule. This happens naturally in cases like rust or wood burning. Sometimes, when this happens free radicals are formed. **Free radicals** are chemicals with unpaired or “free” electrons.

How do antioxidants work?

Antioxidants come in several different forms defined by their function. Two major routes of antioxidant activity are free radical scavenging and metal chelation. **Free radical scavenging** measures the ability of an antioxidant to either prevent the formation of a reactive oxygen species or to remove a free radical before it is able to cause oxidation. **Metal chelation**, on the other hand, removes heavy metals, a common source of free radical generation – thus stopping the formation of the source of oxidation before it forms.

What antioxidants are found in wines?

Wine is a complicated solution of thousands of chemicals derived from the grape skin, grape stems, grape seeds, grape juice, the fermentation process, and the wood aging process [2]. Many of these chemicals have antioxidant properties as either free radical scavengers or as metal chelators. The primary group of wine chemicals with antioxidant properties are phenolic compounds. More specifically, antioxidant activity in wine is most strongly associated with a sub-category of phenolics called flavonoids. The flavonoid group called **anthocyanins** are potent antioxidants that are strongly associated with the antioxidant properties of

wine [3]. Other, non-flavonoid compounds in wine, such as the **stillbenoid** resveratrol have putative antioxidant capabilities as well, however mounting evidence suggests that phenolic compounds like anthocyanins comprise the bulk of the innate antioxidant capabilities of wines.

In addition to antioxidants that occur naturally in wine, there are several legal wine additives with potent antioxidant activity [4]. For example, ascorbic acid (also known as Vitamin C) is a legal wine additive widely recognized as an antioxidant. *As such, we can consider the antioxidants within a wine to comprise both internal (e.g., phenolic compounds) as well as external (ascorbic acid) compounds.*

Due to the wine-making process, red wines almost universally have higher levels of phenolic compounds than white wines (Figure 1). However, there is significant variability varietal to varietal or even region to region in wine phenolics. Further, these factors can be influenced by decisions made during the winemaking process, including the degree of lees contact, type of grapes used, the use of specific phenolic extraction techniques, and the addition of additives such as ascorbic acid or some tannin additives. As such, there exists significant variability, even within a single wine varietal, in the presence of antioxidants within different wines.

How does IBG measure antioxidants?

The Integrated Beverage Group, hired an independent analytical chemistry lab to measure many antioxidant compounds in wines using standard measurement techniques. For this measure, total phenolic content and ascorbic acid content are determined by Gas



Chromatography – Mass Spectroscopy. Briefly, samples of wine are purified and the desired molecules are extracted from the wine solution. Once extracted, these samples are analyzed and quantified using standard analytical chemistry methods.

How does IBG determine that a wine

For the purposes of this claim, “25% more antioxidants” is defined as: a free radical scavenging activity sufficient to place the wine 25% above the median (e.g., the 75th percentile). Ellipse Analytics has developed a database of wine chemistry. Over the last three years, Ellipse Analytics has tested thousands of wines each for hundreds of chemicals ranging from standard macro-molecular wine measurements such as Ph, sugar, and acidity to more nuanced measures that related to the taste and aroma characteristics of these wines. Among these measures are standard assessments of antioxidants within wine – innate phenolics and legal additives with antioxidant properties (see figure 1). This database allows for a precise estimation of the antioxidant compounds present within wines. The antioxidant score for a wine is given as the percentage of inhibition of the DPPH during a set period of time.

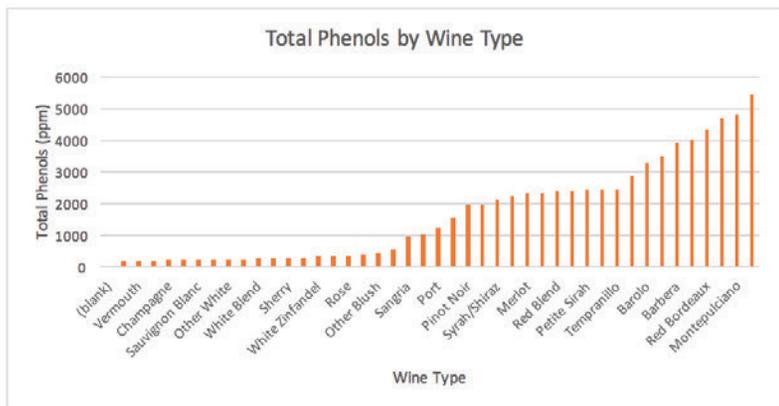


Figure 1: The average phenolic content of various wine varietals. Analysis based on a sample of 1,626 wines.

When determining how a single wine compares to the rest of the industry, a few assumptions and decisions are made. First, as discussed above, wine antioxidants vary significantly from type to type. As such, wines are only compared within type (e.g., red wine to red wine). Second, as wine antioxidant data is not normally distributed, a wine is compared to the median antioxidant level for the varietal, not the mean.

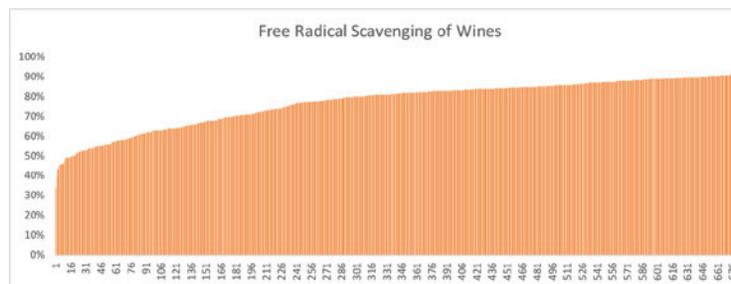


Figure 2: Free radical scavenging activity of various wines as measured by the DPPH method.

Figure 2 summarizes antioxidant activity in a sample of 678 wines. Based on the above data, the median antioxidant activity of wine is 81%. The median value varies as a function of wine type and varietal.

References

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