



Wine 101

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Introduction

Wine, alcoholic beverage made from the juice of grapes. During fermentation, microscopic single-celled organisms called yeasts digest sugars found in fruit juice, producing alcohol and carbon dioxide gas in the process. Although grapes are the most common fruit used to make wine, wine is also made from the fermented juice of pears, apples, berries, and even flowers such as dandelions. Wine naturally contains about 85 to 89 percent water, 10 to 14 percent alcohol, less than 1 percent fruit acids, and hundreds of aroma and flavor components in very small amounts. Wine character—its taste and smell—is derived from many factors including the grapes it is made from, where they were grown, and the production techniques applied by the wine maker, or enologist.

The practice of making wine is as old as our most ancient civilizations, and wine has played a central role in human culture for more than 8000 years. In contrast to most foods and beverages that spoil quickly or that can spread disease, wine does not spoil if stored properly. The alcohol in wine, called ethanol, is present in sufficient concentrations to kill disease-causing microorganisms, and throughout history, wine was often safer to drink than water or milk. This property was so significant that before the connection between microorganisms, poor sanitation, and disease was understood, ancient civilizations regarded wine as a gift from the gods because it protected against disease.

Wine Grapes & Vineyards

The main grapevine cultivated for wine production is the European wine grape, *Vitis vinifera*. Native to areas along the Black, Caspian, and Mediterranean seas, today there are more than 5000 varieties of *Vitis vinifera* grown in the world. Because this grape plant prefers warm, dry summers and mild winters, successful cultivation is limited to temperate climates in both the northern and southern hemispheres. The most popular red varieties in the United States are zinfandel, cabernet sauvignon, grenache, merlot, and pinot noir. The most popular white grapes are colombard, chardonnay, chenin blanc, and sauvignon blanc.

Natural factors make wine from a particular region unique. Known in the wine industry as terroir, these factors include local climate (temperature, rainfall, and sunlight), location of grapevines (altitude and slope), and soil (structure, composition, and water drainage). In general, a grapevine produces the best fruit when the moderate climate provides much sunshine and cool nights without frost, and the soil is well drained. Grapevines grow best in sandy, chalky, or rocky soils.

Wine grapes are grown in vineyards, where individual vines are grown or trained on a system of stakes and wires, called a trellis, to optimize sun exposure. The first harvest of grapes can be made in the third year after planting, and a full crop suitable for commercial use can be expected after five years. Grapevines may produce fruit for 20 to over 100 years. The grapevine growth cycle begins in early spring when new shoots appear on the buds of the grapevine. These shoots develop flowers that blossom and then produce clusters of tiny green grapes. The grapes begin to ripen in midsummer and are ready to be harvested beginning in midfall, depending on the location, grape variety, weather, and the type of wine to be produced. By the end of fall, the vines lose their leaves and become dormant until the following spring.



A wine's character is strongly affected by wine growing, or viticultural practices such as training, trellising, harvesting, and pruning. Training and trellising enable the viticulturalist to control the sun exposure to ensure the grapes ripen evenly. Grapes harvested when they are not ripe may be low in sugar and may not ferment properly. Overly ripe grapes have very high sugar content and produce wine high in alcohol. Once the vines are dormant, the viticulturalist prunes the vines to remove the dead wood. Pruning enables the grower to control the size and shape of the vines, as well as the number of buds that will develop the next year. Too many buds on a vine may stress nutrient availability, reducing the quality of the future harvest.

Grapevines have many natural enemies: insects, molds, bacteria, viruses, and animals such as deer and birds that eat the young shoots or the sweet grapes. Certain soilborne pests, such as the root louse Phylloxera, destroy the roots of European grapevines. Vines native to North and South America have a natural resistance to this insect, but they often produce grapes with an undesirable flavor. To counter this problem, American vineyards use grapevines grown from two different parts: the roots from resistant American vines and the part above the ground from European vines. The process of combining parts of two different plants is known as grafting and works much like healing a broken bone.

There are 8 million hectares (20 million acres) of vineyards in the world producing about 60 million tons of grapes each year. About 26 billion liters (7 billion gallons) of wine are made from those grapes. The biggest wine producers worldwide are Italy (24 percent), France (21 percent), and Spain (10 percent). The United States is the fifth largest producer in the world, producing about 6 percent of the world's wine. California produces 90 percent of all the wine in the United States, with enologists in New York, Washington, Oregon, and at least 41 other states making the remainder of U.S. wine.

How Wine is Made

Wine is the product of the fermentation by yeast of grape juice or grape must, grape juice that still contains the fruit's skins and seeds. Once the grape sugar has been completely consumed, fermentation is complete, and wine has been produced. The science that deals with wine making is known as enology.

While the basic production elements of wine are simple, manipulation of the grapes, juice or must, and wine to produce the desired combination of flavors and aromas is very difficult, and many recognize this process as an art form. Wine makers try to optimize production of specific aromas and flavors—described with terms like cherry, chocolate, vanilla—and minimize the formation of negative flavors and aromas—described as wet dog, plastic, and rotten egg. It is also important that the wine acids and alcohol are balanced. If the wine is too acidic, the wine may taste sour. If the ethanol level is too high, the wine will have a strong taste of alcohol.

The single most important factor that contributes to a wine's character is the grapes that are used. Grapes influence the wine's flavor, alcohol content, acidity, and even its color. White wine, which is actually straw to golden-yellow in color, is produced from white grapes, and red wine is produced from red grapes. Red and white wine production is basically the same except for one primary difference: the presence of the grape skins during fermentation. White grapes are crushed and the juice separated from the skins prior to fermentation. Red wine is fermented with the grape skins.



Red pigments called anthocyanins and other compounds in the grape skins are extracted during the fermentation process to impart the characteristic red color of the wine as well as other features. A blush or rosé wine is light pink in color and is produced from red grapes not fermented with the skins.

A little pigment is released when the red grapes are crushed, but not to the same extent as during fermentation.

In modern wine production, the grapes are harvested from the vineyards and taken to a winery where they are passed through a machine called a destemmer-crusher that separates the fruit from the stems and cracks the berries open to release the juice. To make white wine, the must is transferred to a press where pressure is applied to separate the juice from the skins. The amount of pressure used influences what flavor compounds are extracted from the skins. After pressing, the white juice without the skins is transported to a fermentation tank. In red wine production, the must from the crusher is transferred directly to a tank for fermentation.

The containers used for fermentation are mostly stainless steel or wood. The type of container used and the temperature of fermentation influence the characters of the wine. Many of the aroma components of wine are volatile—that is, they leave the wine by evaporation. This evaporation occurs faster at higher temperatures, so to retain fruity characters in the wine the temperature of fermentation must be controlled, usually by direct cooling of the fermentation tanks. Stainless steel is much easier to cool than wood and is preferred for temperature-crucial fermentation.

The wine maker may allow fermentation to proceed relying only on the yeast naturally present on the grape skins and in the winery equipment, or the wine maker may add extra yeast in a process known as inoculation. Two yeast species are used in fermentation, *Saccharomyces cerevisiae* or *Saccharomyces bayanus*. Yeast is responsible for the presence of positive but also negative aroma characters in wine. For example, when yeast is under stress it produces a compound called hydrogen sulfide, which smells like rotten eggs. To avoid this undesirable quality, a wine maker may add nutrients to the fermentation tank. The duration of fermentation also influences wine character.

Other naturally occurring microorganisms may grow in the must or juice, affecting the flavors and aromas of the finished wine. For example, lactic acid bacteria use the acids in wine as a source of energy, reducing the wine's acidity. These bacteria also produce other aromas and are responsible for the buttery smells that can be found in wine. Sometimes the wine maker restricts the growth of lactic acid bacteria, especially if the wine is already low in acidity or if the buttery character would clash with other aromas of the wine. *Acetobacter*, another type of bacteria, can spoil the wine by converting ethanol to acetic acid to make vinegar.

When fermentation is complete, red wine is separated from the stems and grape skins by passing it through a press. Both red and white wines appear cloudy after fermentation, and the wine maker must wait for the yeast and other solids to settle to the bottom of the fermentation tank, forming a sediment called the lees. The clear wine is racked or drawn off the lees and stored in a clean cask. In a process called fining, the wine maker may further clarify the wine by adding ingredients that attract unwanted particles, such as proteins that can cause cloudiness. These added ingredients settle to the bottom and can be easily collected and removed.



After fermentation, the wine maker has to decide how the wine will be aged. Aging of wine significantly affects the flavors and aromas present, and several different techniques are used. For example, wine aged in oak barrels picks up some flavor and aroma characters from the oak wood, a very desirable quality in some wines. A wine may be aged under conditions encouraging the loss of some of the fruity, volatile compounds, producing a wine rich in other characters, such as spicy or toasted flavors. Air exposure during aging can cause the phenolic wine compounds, extracted from grape skins and seeds, to combine with each other, producing large chemical compounds called tannins. Over time the tannins become so large that they form reddish-brown sediment in the bottle.

This reduces wine bitterness and astringency. The length of time a wine is aged before it is bottled determines the extent to which these reactions occur. Once the wine has been aged, it is ready to be put into bottles, where it may continue to slowly age for many years.

Classifications of Wine

Wines are categorized using a number of different methods. Sometimes they are grouped into different categories by grape variety, region of origin, by color, by the name of the wine maker or vintner, or by production technique. Three basic groups of wines are most easily distinguishable for the consumer: table wines, sparkling wines, and fortified wines.

Table wines, also known as still or natural wines, are produced in many different styles and make up the majority of wines on the market. Traditionally consumed as part of a meal, table wines contain between 10 and 14 percent alcohol and are further classified by their color, sugar content, and the variety and origin of the grapes that were used. Depending on the grape variety and wine-making technique, wines can be white, red, or pink in color. Most table wines are fermented until they are dry—that is, all the grape sugar has been turned to alcohol by the yeast. Slightly sweet or off-dry wines are made by stopping the fermentation before all the sugar is gone or by adding grape juice back to the wine afterwards.

In wine-producing regions outside of Europe, particularly California and Australia, table wines are often classified by the grape variety they are made from. At least 75 percent of the grapes used to produce the wine must be of the named grape variety. Chardonnay, for example, is wine made from at least 75 percent chardonnay grapes. Wines classified this way are sometimes called varietals, and include wines such as riesling, cabernet sauvignon, and merlot.

The traditional European classification system puts more emphasis on the region—or appellation—where the wine is from. The French system of Appellation d'Origine Contrôlée labels wines based on their geographical pedigree. The most renowned wine-producing regions in France, and possibly the world, are Burgundy, in central France, and Bordeaux, a region on the southwestern coast of the country. Bordeaux maintains a famous geographical classification system for some of its viticultural areas, dating back to the year 1855. Bordeaux ranks its best wineries, called châteaux, and their vineyards—crus, into five classes called grand crus. The highest class, called premier grand crus, is still held by only five wineries: Château Margaux, Château Latour, Château Mouton-Rothschild and Château Lafite-Rothschild in Pauillac, plus Château Haut-Brion in Graves. Wines from these vineyards in France are considered to be among the highest-quality wines in the world.



Altogether, France produces about 600 million cases (containing 12 bottles each) of table wine each year.

The French Appellation d'Origine Contrôlée system has been adopted by most other wine-producing countries. In addition to the primary grape variety used to make the wine, American wineries use a tag on their wine bottle labels called Appellation of Origin to indicate where the grapes were grown. An appellation can be a country, state, county, or geographically defined American Viticultural Area (AVA). At least 85 percent of the grapes used to produce the wine must be from the viticultural area stated on the label. The United States currently recognizes more than 130 AVAs, distinguishable by geographical features. The largest growing region in the United States, California, has at least 75 AVAs, including the Napa and Sonoma valleys. About 150 million cases of table wine are produced in the United States each year.

Sparkling wine is made from table wine that has undergone a second fermentation. The wine maker adds a measured amount of sugar and fresh yeast to the dry wine. This can happen in a closed tank, or directly in the bottle, which is the way the most famous sparkling wine, French champagne, is produced. The yeast ferments the added sugar, but this time the carbon dioxide gas remains in the sealed bottle, creating carbonation. When the sparkling wine is poured into a glass, the gas bubbles to the surface.

Under the Appellation d'Origine Contrôlée system, only sparkling wines produced in the Champagne region of northeastern France can officially use the name champagne. Sparkling wines produced in all other regions of the world, even those produced using the traditional champagne method, are simply referred to as sparkling wines. About 13 million cases of sparkling wine are produced in the United States each year.

Fortified wines contain additional alcohol and are usually consumed in small amounts as aperitifs before meals or dessert wines after a meal. Popular examples are port and sherry. In port wine making, which originated in Portugal, the grapes are crushed and the fermentation started but then stopped by the addition of more alcohol, which kills the yeast. The resulting wine is sweet and has an alcohol content that is 5 to 10 percent higher than table wine. Originally from Spain, sherry is made by adding alcohol to a young dry wine in an oak barrel intentionally filled only halfway. Special yeasts called flor yeast grow on the surface of the wine and create the distinct nutty flavor characteristic of sherry. About 8 million cases of fortified wines are produced in the United States each year.

Brandy is made from wine but is classified as distilled liquor, not as wine. Brandy is distilled from wine to concentrate the alcohol in the wine. To make a distillate, wine is heated in an enclosed copper pot until it boils and the alcohol evaporates. The alcoholic vapor passes through a coiled pipe where it is cooled down until it forms a liquid again, or condenses. After distillation the brandy is aged. Bottled brandy typically contains 40 percent alcohol and has been aged in oak barrels for several years.

Storing and Serving Wine

If stored properly, wines can be aged for many years without spoiling or losing quality. The most important factor in wine spoilage is air exposure. Oxygen from the air permits microorganisms to



grow on the surface of the wine, producing negative flavors and aromas, such as those that smell like vinegar or nail polish. Oxygen can also trigger chemical reactions that lead to flavor losses and color changes. To avoid these changes, wine should be stored in a way that limits or eliminates oxygen exposure. Very little oxygen exposure occurs in completely full wine barrels. While the wine is aging in a barrel, wine makers take great care to limit the air space in the barrel by regularly adding wine to the barrels to fill vacant space formed as the wine evaporates. This process is called topping off.

Wines last best if bottled with little or no air space in the bottle. The traditional closure for a wine bottle is a stopper made from the bark of the cork oak tree, which when properly used prevents air from entering the wine. Optimally, wine bottles should be stored horizontally, enabling contact between the wine in the bottle and the cork. This prevents the cork from drying out and letting oxygen to seep into the bottle. Bottled wines can be stored for decades in a cellar at low temperature, approximately 16° C (60° F). As wine ages in the bottle, precipitates may still form and appear as crystals or sediment. These sediments are not harmful, and their appearance does not mean that the wine has been stored improperly or is otherwise spoiled. The salts of the fruit acids in wine, especially tartaric acid, form a precipitate that looks like fine crystals and is sometimes mistaken for glass by consumers. These so-called wine diamonds are harmless and readily sink to the bottom of the wine.

White wines are usually served chilled because at warmer temperatures they quickly lose their volatile characters and become flat and tasteless. Blush wines are also served chilled like white wines. Normal refrigerator temperatures of 4° to 10° C (40° to 50° F) are sufficient for chilling white and blush wines. Red wines, which usually contain more flavor and aroma components than white wines, are served at room temperature to release the aroma characters, and the wine smells and tastes better than it would if it were chilled.

Traditionally, different types of wines are served in glasses of different shapes to enhance their individual characteristics. For example, robust red wines may be served in a glass with a generous, wide bowl and a narrower mouth. The bowl enables the wine to be easily swirled in the glass without spilling to encourage evaporation of some of the volatile compounds. The smaller mouth of the glass concentrates the ensuing aroma—sometimes referred to as the bouquet—so that the nose can readily appreciate the wine's aroma. Sparkling wines are often served in tall, narrow glasses that clearly display the beautiful bubbles as they rise to the surface. Wine can be enjoyed in any glass, however, and ultimately, personal preference should determine the type of glass used.

The flavors of different wines are very distinctive and some are considered to taste better with certain kinds of foods. A wine with a very delicate flavor goes best with lightly flavored foods rather than with strong flavors that overpower the wine, making it appear tasteless. Likewise, if the wine is too strong in flavor for the food, the food tastes bland. Great chefs are considered masters of pairing wine with food so each enhances the flavor and aroma of the other.

The History of Winemaking

Although the origins of wine are unknown, archaeological evidence suggests that wine was being made at least 8000 years ago, and there are indications that viticulture was carried on in Mesopotamia (the region that is now Iraq and eastern Syria) about 5000 years ago. Writings from



the same time from China and Egypt also mention wine and vineyards. Egyptian frescoes show festive grape harvest scenes, an atmosphere that still prevails in wine-producing countries during the harvest season. The highest-quality wines were reserved for the Egyptian kings and pharaohs, and wine was accepted as payment for taxes. The Code of Hammurabi (2000 bc), a written collection of the laws of the Babylonian king Hammurabi, stipulated the conditions of the purchase and sale of wines and described the punishment inflicted on any wine merchant caught cheating a customer.

By the time of early Greek civilization, about 3500 years ago, wine was a popular beverage as well as a sacred drink. In Greek mythology, Dionysus was the god of wine, overseeing all matters pertaining to the cultivation of grapes and wine production. The ancient Greeks were the first to cultivate wine for commercial purposes, and to market their wine abroad. Greek wine was very different from modern times—storage vessels were lined with resin, a water-resistant substance secreted by plants, which imbued the wine with a turpentine-like taste. The Greeks often flavored their wine with spices, herbs, flowers, and perfume, and always diluted it with water before consumption.

Wine was equally important to the ancient Romans who looked to Bacchus, the Roman god of wine, to oversee all wine matters. In the highly organized economy of the Roman empire, viticulture was centered in the areas of present-day Italy, Spain, Greece, France, and Germany. Some of the finest vineyards in France and Germany have been under cultivation since this time. The vigorous wine trade of Roman civilization languished as the empire declined, and for centuries after, western European viticulture was largely sustained by the Catholic church. Wine-making monastic orders produced wines not only for sacramental use, but also for marketing to produce revenue for the orders. Monks developed the predecessors of some modern grape varieties, and in abbey wine cellars they experimented with the forerunners of brandies and other wine-based liqueurs.

In the revival of commerce that preceded the Renaissance (14th century to 17th century), wine trading became a main attraction at lively fairs held in many French and Flemish towns. The English were eager buyers of Bordeaux wines. In ad 1152, Eleanor of Aquitaine married Henry of Anjou, who later became Henry II, and brought to the English crown a rich dowry: Bordeaux and part of the Loire Valley, another renowned wine growing region with many vineyards. For three centuries the English appetite for Bordeaux wines made the region prosper.

The wine industry flourished in almost every new country settled by Europeans, as the colonizers took with them their knowledge of viticulture and often their own grape varieties. In North America, serious production of wine began in the mid-1800s. Around this time grape varieties from North and South America were transported back to Europe. These vines carried the deadly insect Phylloxera that quickly infected the ancient European vines, nearly devastating European vineyards. It was at this time that the resistance of certain American vines to the insect was discovered, and the practice of grafting American roots to the fruit-bearing parts of European vines saved European wine production. American and European vineyards were replanted with grafted vines. American wine production did not truly flourish until the mid-20th century, after the repeal of Prohibition, the period in American history when the manufacture and sale of alcoholic beverages were illegal.

Plagues, politics, war, and even fads in drinking have often modified the trading and drinking of wine. The bubonic plague halted urban wine commerce. Rivalry between England and France in the 15th century interrupted the lucrative Bordeaux trade. In the 17th century cheap Portuguese wine



entered the English market. A popular craze for gin seized wine-drinking England in the early 18th century.

Then German Rhine wine became popular, followed by Madeira, produced in the Portuguese Madeira Islands, and then Spanish sherry. By about 1875 French wines dominated world trade, and since that time European wine industries have led the world in international wine trade.

The drinking, selling, and making of wine is fraught with traditions and legends, many of which persist to this day. For example, a wine auction in Burgundy is held annually at the Hospices de Beaune, a 15th-century charity hospital, which through the years has acquired by donation some of the finest vineyards in the region. A continuous tradition for four centuries, each November this auction draws an immense crowd of wine lovers, wine dealers, and tourists from many countries. Because it is the first opportunity to taste the new Burgundy wines each year, bids made at the auction are generally considered good indicators of price trends for the coming year.

About Us

K.D. Imports, LLC is based in South Florida, USA and imports fine wines primarily from Italy.

The wines of **K.D. Imports, LLC** have had the honor of appearing on several "Wine Spectator Award of Excellence" wine lists throughout the USA and have been featured at both the Chicago and New York City Wine Enthusiast "Toast of the Town" wine tasting galas. Our San Giulio Prosecco has even been featured on NBC's "Today Show."

For more information on our company, our products, or opportunities to partner with us, please visit www.kdwineimports.com or visit us on [LinkedIn](#) or [Facebook](#).