

Barrels

It's hard to find traces of oak barrels because it is not likely wood survives time and it falls apart or used for fire. However, references to barrels can be found in old literature. The widespread uses of barrels explain the disappearance of Amphorae. Barrels were surely used for the transportation of wine as well as other liquids and goods like salt. So why are these barrels so precious for winemakers? Among the different wood species only oak possesses the right amount of tannins and positive flavors that so harmoniously interact with the wine during the storage time. Other species of wood have been used in the past like chestnut but rarely nowadays. Large size chestnut vats are still in use sometimes though.

Timber for the barrels came mostly from France and US, but today you see more and more oak from Eastern Europe forests. In France there are 4 different places where oak trees are cut down for barrels and the reason is that the soil differs a lot between these areas. Where the soil is clayey and poor growth is slow and the wood has tight grain, and, this is what most winemakers want for their wines. It gives a lot of aromas but not too much tannin. Soil that is clayey, chalky with granite gives wood with coarse grain. It's less aromatic and extracts a lot of polyphenols. Then we have the American white oak, very popular to use. It contains a lower quantity of phenol compounds than European species but it has much more of coconut and vanilla (lactones) like aromas. This goes very well with the Merlot grape, maybe not as well with the Syrah (empirical studies). Different grape varieties due to tannins and flavors interact more or less well with oak.

When the tree is cut down and split it has to lie outside for nine to thirty-six months. The wood is dehydrated and matured this way. The outside weather has its impact on the outcome. A lot of chemical reactions are now happening that enhance some flavors and diminish others. It softens up the bitterness and astringency in the wood.

Then the staves are made and selected. It takes 18 to 25 staves to make a barrel. They are put together and then the burning starts (that is of major importance for the style of wine you want to achieve). The heating makes the wood bendable, so the barrel can be shaped, it also removes bitter compounds and the aromatic impact of the barrel is modified.

There are different levels of heating (burning). Only "light" heating is normally not used for wine. "Medium" or "medium plus" are mostly used: now you can find toasted notes in the wine like grilled almond, bitter almond, toasted notes and coffee. "Heavy" burning burns the wood quite deeply and you find cracks in the wood: the wood reaches a maximum of grilled and spicy aromas and dark chocolate is typical.

The grape variety and the quality of the mature grapes are the most important factors, then it is the winemaking methods that qualify the wine for barrel maturing or not. To be able to use "heavy" heating you need grapes that are very concentrated with a lot of polyphenols and certainly tannins. Many of the top producers in Bordeaux use that kind of burning with an extraordinary result 10 or more years later.

Because the success of the Bordeaux wines everyone put their wine for maturing in oak. And this is unfortunate for the consumers. Most of the wines should never get inside a wine barrel. The wines produced are often too light and the result is a woody wine masking the fruitiness and the character.

You will experience the wine harsh with a distinct woody flavor. To find the perfect harmony between the oak and the flavors in wine is not obvious. It's all down to business and all sorts of unnatural manipulations through additives are made. To avoid the cost of barrels all together oak shavings or oak staves are used to "flavor" the wine. Most low cost oaky wines are made that way.

Here you can find some of the flavors coming from the oak and the heating of the barrel.

Oak

Coconut

Vanilla

Caramel

Toasted bread

Grilled almond

Bitter almond

Char, smoky

Spices

Chocolate

Using new barrels affects the wine often too strongly if the goal is to sell the wine within a couple of years for consumption. Very often producers chose barrels that already have been used for a couple of vintages. A lot of the wood tannins are soaked out weakening the grilled and smoky aromas. But you still feel the wood flavors integrated in the wine. The wine also becomes concentrated and spicy. And the important microoxygenation is the most vital part of the maturation of a wine left in barrels. It's very common to mix new and used barrels in different constellations. And then it's blended before bottling.

But don't get confused now and think that it's the barrels alone that give you the pleasure of a great wine. It develops the wine to a new level of quality for sure, but wine is a very complex mixture and it is many stages and interactions before the wine reach the barrels.

Polyphenols and aromatic compounds come from:

- Regional impacts.
- The grape varieties, different clones.
- Pre fermentation/ cold maceration: chill the grapes to delay fermentation.
- Alcoholic fermentation: sugar turned into ethanol and CO₂ and secondary aroma flavors.
- Maceration: prolonged skin contact from hours to several weeks.
- Malolactic fermentation: lactic acid bacteria transform malo acid to lactic acid; lower the acidity in wine. But this fermentation has a great impact on wine structure.
- Maturing on Oak: micro oxygenation, flavor input from the wood and the heating of the wood.
- Bottle ageing: oxidative, reductive, enzymatic and acid estrification flavors develop in the wine.

I think the most interesting development of flavors in wine comes from the "bottle ageing". And to get good bottle ageing you need a good quality wine to start with. Generic wines get softer but don't develop anything specific that adds to quality.