

[1] When the grapes are crushed, it is important the skin doesn't tear too much. As well as causing unwanted excess tannins and making it difficult to separate off the juice, the juice may get over oxidised. Some wineries don't crush the grapes but use a process called carbonic maceration. Carbon dioxide helps the juice to ferment while still part of the fruit. Sulphur dioxide is added at this stage to prevent oxidation and inhibit microbial activity.

[2] Sulphur dioxide (SO_2) is added as part of the wine making process in quantities up to 400mg/L (for some sweet wines, but generally up to 250mg/L). These amounts are set by Food Standards Australia and New Zealand. SO_2 stops the growth of unwanted yeast (which causes mould) and bacteria.

Sulphur dioxide also stops oxidation (caused by excess oxygen, which spoils wine flavour—makes it taste like vinegar—and colour—white wines go darker, others go cloudy) and preserves the wines natural flavour and colour.



White wines are more prone to oxidation, because red's higher tannin levels act as a buffer. Even if not added, there will be some present as it is a by-product of alcoholic fermentation of natural yeasts. High levels of sulphur can cause headaches, skin flushes, sinus, nausea, asthma etc.



[3] The fermentation process preserves the grape juice and converts it into wine. Primary fermentation is the process when microscopic yeast (which seems like a powder on the grape's skin) ferments anaerobically (without oxygen) converts the sugars and natural acids from the fruit into alcohol and carbon dioxide. White wines need a temperature between 15 & 18C and red wines need a higher temperature (22-25). Malolactic fermentation is when certain strains of bacteria are added to the process to convert harsher acids into tamer acids, making a different kind

of wine.

[4] Secondary fermentation happens when the wine is stored in airtight containers (stainless steel vats or oak barrels) and any remaining sugars are converted into alcohol. The barrels are in cellars that have an even temperature and perfect humidity conditions. Wine can only store for a certain amount of time (depending on the variety and how that years harvest was) before the wine deteriorates.

Mould can grow in the barrel. This causes an earthy, mouldy, musty smell that masks the natural fruit aromas that are so valued in wine.

Brettanomyces is yeast spoilage. This thrives on wood (ie barrels) and will make the wine taste disgusting.

[5] Sediments that could harm the wine are removed after fermentation. This can be done by filtering, siphoning or adding substances (eg gelatin, milk, egg products) to make the solids stick together and fall to the bottom.

[6] More sulphites may be added before the wine is bottled. This is to ensure fermentation will be hindered.

Wine may also start re-fermenting if the dormant yeasts wake up because the bottling environment was not sterile.

[7] The bottles are corked or capped. In NZ, we will generally find that caps are used. The caps sometimes have an added capsule to make the seal more secure. Corks naturally create an air seal in the neck of the bottle because they can compress into the area then expand out.



[8] Wine needs to be bottle aged and stored properly. Those with corks should be stored lying down and at ~ 70% humidity to keep the corks from drying out. Storing at 10-12C is best as higher temperatures speed up the aging process. Heat exposure (called maderized) can happen through improper storage. UV light (called lightstrike) can cause unwanted flavours.

[9] Wine is generally stored for consumption in a glass bottle. Sometimes the colour of the glass is used as a way of helping to signal the type of wine or the region it comes from. The main reason for coloured glass is that natural light can break down desirable oxidants such as Vitamin C and tannins, which effects storability and can cause the wine to oxidise. Therefore it is mostly ready to drink wines that don't need to be stored for a long period of time which are bottled in clear colourless bottles.



[10] Once the bottle of wine is opened, there are some ways of preserving it. One is a vacuum pump (to pump out the oxygen). This might extract aromas from the wine, which wouldn't be wanted. Or you can add an inert gas that is heavier than air so floats on top of the wine.

[11] Some wine is sold in a wine box. This is a plastic bladder with an airtight tap that is protected by a cardboard box. One of the main advantages is seen to be the prevention of oxidisation during dispensing (wine in a bottle is oxidised by air in the bottle which has displaced the wine poured). Most has a best before date and is not intended for cellaring. It may show noticeable deterioration after 12 months.

Wine is also sold in plastic (PET) bottles. Because they are lighter, smaller (for the same volume of wine) and harder (than glass) to break, they make transporting more efficient, thus reducing the carbon footprint. However, more oxygen can get in (compared to glass) so the wine has a shorter shelf life.

Eco-friendly cardboard wine bottles are also appearing on the market. They are made from compressed recyclable cardboard with a plastic liner. These are claimed to have a carbon footprint of 67% less than a glass bottle. They are also claimed to keep the wine cooler for longer.



[12] Wine sold in NZ must be labelled to meet the following requirements: legibility and in English, Name of food (eg white wine, pinot gris etc), lot ID, name and address of supplier, alcoholic declaration (eg 13% alc by volume), net contents, standard drinks, country of origin, date of labelling, allergens (all wine must declare sulphite if it is more than 10 mg/kg). Wine labels must not make health claims or say they are low in alcohol or non-intoxicating etc.