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Basic Wine

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Stability of Sauvignon blanc aroma after fermentation

With most Sauvignon blanc ferments coming to an end, it is important to already start thinking of preservation techniques. Great care was taken during harvest and strategic winemaking techniques were employed for the optimal formation of aromatics: now to **lock it all in**.

Compounds differ immensely in their stability, for instance, the methoxypyrazines are not sensitive at all, while 3MHA is subjective to even the slightest oxidation and degrades exponentially.
From the multiple research sources available, a few important factors were identified that could help with the preservation of all the compounds, whether they be highly sensitive or not at all:

1) Sulphur Dioxide

Yes yes, we all know that SO_2 is a preservative, but its effectivity can sometimes be understated. Studies have shown that **sulphur dioxide is extremely effective in preserving wine components**, especially volatile thiols. The soonest SO_2 can be added, the better.

When is soonest?

It is important to ensure that the fermentation is completely finished, not only to keep your yeast happy in the last stages but also to prevent your total SO_2 from increasing due to binding with residual acetaldehyde.

2) Oxygen

Avoiding oxygen exposure is crucial to avoid oxidation of the aroma compounds. This is especially important due to the absence of antioxidants at these early stages post-ferment.
If possible, avoid transferring the wines between tanks and delay racking as far as possible. Also keep your tanks topped up to decrease the headspace volume (important to use wine of similar quality).
Studies have shown that if there is sufficient sulphur dioxide present in the wine, then the effect of oxygen exposure is minimalized. So, if you foresee significant oxygen exposure during the post-fermentation stages, **ensure that sufficient antioxidants** are present and try to **use inert gasses** or dry ice to minimize the exposure (you still want to keep your total SO_2 as low as possible).

3) Temperature

It is absolutely vital to **keep the wine at a low temperature** (as low as possible). Higher temperatures can be considered as an accelerator. Not only do higher temperatures accelerate oxidation but it will encourage degradation and evaporation.
Tests showed that differences in storage temperature of only 3°C (such as 15°C vs 18°C) could have a massive impact on thiol preservation. The cost of refrigeration should be considered and a workable compromise of 10-12°C was identified.

Keep in mind:

Here the dissolved CO_2 post-ferment can be troublesome. The lower temperature will also retain dissolved CO_2.

4) Degradation

Some compounds are **naturally unstable** in a wine medium. This means that the compound will degrade over time no matter how much SO_2 are present. Colder storage temperatures will certainly help delay this degradation, however, degradation is still inevitable in the long run.
The volatile thiols, **3MHA, 4MMP as well as acetate esters are highly subjective to hydrolysis** (breakdown) and concentrations decline dramatically over a relatively short period. On the plus side, **3MH is relatively stable** and will remain for a longer period of time after which you will start to observe a decline.
Also, when 3MHA degrades, one of these breakdown components is actually 3MH. Even increases in 3MH have been reported during the initial stages after bottling (together with a decline of 3MHA).
Another factor that can help delay this degradation of especially acetate esters and 3MHA is pH. A study showed that **reducing the pH** from 3.58 to 2.95 significantly delayed the degradation (and/or oxidation) of acetate esters in wine.

5) Evaporation

The actual effect of evaporation directly after fermentation is not well studied. Common sense tells us that there must be some evaporation of the volatile aromatic compounds leading to a decrease in concentration. **Maintaining a low temperature should minimalize the evaporation effect**.
Preliminary results from a study at the University of Stellenbosch showed that sparging a wine with nitrogen only resulted in the loss of dissolved CO_2 while it had no effect on the volatile thiol concentration. Therefore, some evidence exists that the **evaporation effect does not play as big a role** as we tend to think. Further studies are underway to confirm. We will keep you updated!

Contact Carien

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