

MASTERING FERMENTATIONS WITH HIGH ALCOHOL CONTENT

The **high concentrations of sugar** sometimes found with **particularly warm vintages** or **overripe berries** can, among other things, lead to **fermentation problems** ranging from longer lag times to languid endings or even stuck fermentations. This is due to the fact that high sugar concentrations increase osmotic pressure on yeast cell membranes. The yeast then consumes **extra energy to combat this osmotic pressure**, leading to slower fermentation.

It is also known that **alcohol is toxic to yeast** because it has an impact on the fluidity of its membranes.

The higher the concentration, the more yeast mortality will occur. The characteristics of the yeast strain that is used and the nutrition that is selected are **two important factors** in controlling and succeeding in alcoholic fermentation, especially **under extreme conditions**.

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CHOOSING THE RIGHT YEAST STRAIN

VIALATTE FERM® HD18

- Can initiate AF up to a sugar content of 300-310 g/L.
- **Osmotolerant.**
- **Highly resistant to high alcohol content (18%)**
- Nutritional requirements: Low

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CHOOSING THE RIGHT NUTRITION

NUTRICELL® INITIAL

BEGINNING of FA

- Rich in sterols, which are essential components of the yeast membrane that ensure its fluidity and make it resistant to alcohol since the start of AF.

NUTRICELL® FINISH

HALFWAY through FA

- Rich in yeast hulls and amino acids for a balanced supply of nitrogen and lipids during AF.

YEAST HULLS

END of FA

- Rich in sterols, they provide the lipids that are essential for good nitrogen assimilation at the end of AF, while helping to reduce the inhibitory charge of high alcohol content.

LIPIDS, NITROGEN AND YEAST SURVIVAL

Sterols are **lipids that make up the yeast cell membrane**. Their presence is essential for **membrane resistance**, which is **affected by alcohol**, which dissolves the fatty substances and leads to the death of the cell.

Sterols are necessary for the proper development of yeast during alcoholic fermentation. They can come from **various exogenous sources** and are for example naturally **present in grape must** in the form of **phytosterols**. The addition of yeast hulls during fermentation also makes it possible to provide sterols, mainly in the form of **ergosterols**. This **improves the viability** of the yeast by strengthening the cell membrane and allowing **better assimilation of nitrogen**. This rebalancing of the fermenting must is necessary because it has been shown that **the yeast's metabolism and viability depend on the availability of nitrogen, as well as on the presence of lipids** in certain pathways that regulate the assimilation of organic nitrogen.

THE IMPORTANCE OF OXYGEN

Yeast also **synthesizes ergosterols in the presence of oxygen**, especially at the beginning of alcoholic fermentation. It is therefore advisable to add them when the oxygen concentration reaches a limit, which is **systematically the case during fermentation**.