



FACT SHEET

STUCK FERMENTATIONS

Stuck and sluggish fermentations can cause significant economic losses for a winery due to extended labour requirements and purchase of additional yeast and nutrients to restart the fermentation. The wine quality is often significantly impacted causing additional financial loss. Extended periods of time with residual sugar and lack of SO₂ protection increase the risk of microbial spoilage primarily due to *Acetobacter* spp and *Brettanomyces bruxellensis*. Many of the factors contributing to stuck fermentations are found in the must before the yeast is inoculated. But often stuck and sluggish fermentations are an adaptive process with a number of factors culminating to arrest the fermentation.

What causes stuck fermentations?

1. Insufficient levels of YAN relative to the potential alcohol (plant deficiency, excessive water additions, high potential alcohol).
2. A compromised yeast population (temperature shock, stress, lipid deficiency).
3. Incorrect yeast selection (yeast strain unsuitable for wine chemical parameters).
4. Inhibitory factors (Agrochemical residues, metal ions, short chain fatty acids, volatile acidity > 0.8 g/L acetic acid).

How can I avoid a stuck fermentation?

1. Measure **Yeast assimilable nitrogen YAN** in the grapes to understand if there is a known deficiency.
2. Use a **nitrogen calculator** to calculate how much and which kind of nitrogen to add
<https://laffort.com/en/decision-making-tools/>
3. Use a rehydration nutrient with a high ergosterol content to ensure yeast can remain viable to the end of fermentation (For high alcohol red wines particularly).
4. Select a suitable yeast for the wine choice (For example appropriate alcohol tolerance).
5. Juice chemistry analysis (Baume/Glucose and fructose separately/VA/pH/TA) to ensure there are no inhibitory factors (Yeast will not grow under pH 2.8 and above 0.8 g/L acetic acid, so ensuring that the must chemistry permits the multiplication of yeast cells before the fermentation has even begun is critical).
6. Assess grape sanitary state (Laccase testing, glucan testing).

Available analysis

- **Yeast assimilable nitrogen YAN** is a simple measurement which can provide an indication of the amount of nitrogen available for yeast. In most cases, a nitrogen content of below 150 mg N/L is considered deficient. The higher the potential alcohol, the higher the initial amount of YAN required. Laffort recommends using its decision-making tool to understand exactly how much and which nutrition is required for each fermentation.

Table 1. Nitrogen required based on percentage alcohol and starting YAN (www.laffort.com) for a low nitrogen requiring yeast strain

	YAN required (mg N/L)	YAN 1 st addition (mg N /L)	YAN 2 nd addition* (mg N /L)
12 % vol	180	150 – initial YAN	30
13 % vol	190	155 – initial YAN	35
14 % vol	200	160 – initial YAN	40
15 % vol	220	170 – initial YAN	50
16% vol	240	180 – initial YAN	60

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