



SELECTED WINE BACTERIA

Restarting stuck malolactic fermentation

The latest easy and fast protocol for white, rosé and red wines

step 1

DETOXIFY THE WINE

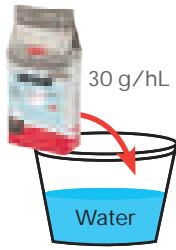
A



30-37 °C



Wait 20 mn

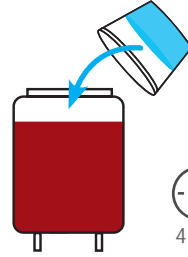


30 g/hL

Water

- Prepare **RESKUE™** at 30 g/hL after a rehydration step in 10 times its weight in water
- Mix then wait for 20 minutes

B



48 h

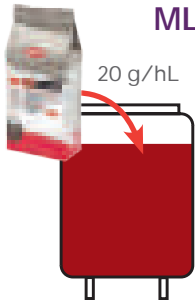
- Add to the stuck wine and homogenize
- Allow to settle for 48 hours avoiding oxygenation.
- Rack the wine avoiding high exposition to oxygen in another tank

STEP 1

The use of specific yeast cell walls **RESKUE™** will help to detoxify the wine by trapping the main inhibitors, mainly pesticides residues and medium chain unsaturated fatty acids.

step 2

MLF ACTIVATOR ADDITION



20 g/hL



Wait 24 h

- Prepare **ML REDBOOST™** at 20 g/hL after rehydration step in water or wine
- Assure a good distribution into the wine
- Wait 24 hours before bacteria inoculation

STEP 2

In order to ensure an optimal growth of the new bacteria inoculum, **ML REDBOOST™** is essential. It has been developed to bring the optimal levels of specific nutrients for wine selected bacteria in terms of amino acids and peptides and also to provide protection of selected wine bacteria against the inhibitory effect of certain polyphenols.

step 3

BACTERIA INOCULATION



Between 18 and 22 °C

- Inoculate with double dosage of **LALVIN VP41 MBR™** without rehydration step (for instance : 2 doses of **LALVIN VP41 MBR™** 25 hL to restart 25 hL of wines).
- Maintain a stable temperature between 18 and 22°C during all the process and until the completion of MLF.

STEP 3

After several years of experiments of stuck worldwide wines, our R&D department showed that a double dose inoculum of **LALVIN VP41 MBR™** is the best answer to restart stuck or sluggish MLF.

This protocol is efficient when wines parameters are not outside of known limiting conditions (high SO₂ content, high alcohol content, low pH, possible excessive amount of pesticides residues, possible presence Chitosan in certain conditions).

Note : Lallemand has also developed a "quick fermentability test" (48-72 hours test). This quick test can be run to determine precisely whether a wine may complete fermentation once re-inoculated. Please, ask your Lallemand contact for further information.



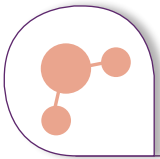
LALLEMAND OENOLOGY

Potential causes for incomplete malolactic fermentation (MLF)



Inappropriate use of bacteria

The choice of the selected bacteria, timing of inoculation, and respect of the instructions of use (dosage, rehydration temperature) and storage conditions are keys to insure a good success of MLF.



SO₂ levels

Free SO₂ will inhibit bacteria growth and MLF completion even at low levels, its impact is even stronger at low pH. But total SO₂, when higher than 50ppm can have a negative impact on bacteria vitality: in this case selected bacteria with higher total SO₂ tolerance have to be chosen.



pH

Every selected wine bacteria have its specific limits with regard to pH. If the wine pH is lower than the pH limit of the selected bacteria, MLF may not proceed. In the case of wine pH lower than 3.5 the bacteria tends to require more nutrients to perform MLF accordingly.



Nutrient limitation

This is considered to be one of the major causes of incomplete MLF. Lactic acid bacteria have specific needs for peptides and amino acids which have to be satisfied in order to achieve an optimal growth and metabolism to perform malolactic fermentation and especially under limiting conditions.

Other inhibiting compounds

- **Certain phenolic compounds** can inhibit MLF such as certain condensed tannins whereas others such as anthocyanins can stimulate them.
- **Pesticides residues** are known to cause sluggish, stuck or complete inhibition of MLF
- The presence of high **L- lactic acid content** (in case of high initial level of malic acid) can inhibit the good achievement of MLF if the right resistant selected bacteria are not used.
- The treatment with new solutions like chitosan or chitines derivatives can disturb the good start or full achievement of MLF depending on wine conditions and on the treatment timing.
- **Some yeast strains**, especially when they have struggled to complete alcoholic fermentation, can release toxic metabolites which cause MLF issues.
- **Medium-chain unsaturated fatty acids** can also have a negative impact on bacteria growth and activity.



Ethanol content

As for all microorganisms ethanol can have a strong toxicity especially at high temperature. It's key to choose the appropriate bacteria which can tolerate the respective ethanol content of the wine.



Temperature

Optimal temperature for MLF is between 18 and 22°C. Some bacteria differ in their tolerances for lower temperatures and it's usually better to avoid higher temperatures in the case of low pH wines, wines with high ethanol or SO₂ content.

