



Protocol: MLF Reinoculation



The Malo-lactic fermentation (MLF) by *Oenococcus oeni* is a globally established standard application in red winemaking processes. However, like in the primary fermentation, it's possible that some wines have difficulties to perform the MLF. The reasons for that can be multiple. Primarily, we have to check the inhibitory parameters in a young wine. Apart from inhibition by chemical parameters, a potential deficiency of nutrient specific for *Oenococcus oeni* are a valid reason for sluggish or stopping MLF.

Furthermore, actual results from the science show that residues from spray in the vineyards have a substantial impact on the performance and survival of the bacteria. Additionally, a very low level of the natural L-malic acid, <1g/L, inhibits the bacteria from starting metabolising the malic acid as carbo-hydrate source. Therefore, the adjustments of the initial L-malic acid content up to >2g/L is recommended and promotes the bacteria activity.

Preparation of a MLF bacteria "Pied de Cuve"

- Take 2% of the wine from the tank as a base for a "pied de cuve"
- Add 20 - 25g/hL ClearUp BIO to remove toxic components such as fatty acids, spray residues, etc.;
 - Rack it after 1 - 2 hours of settling
- Add 20g/hL MaloControl™ and adjust to min 2g/L of L-malic acid, followed by addition of an activated MLF bacteria preparation, e.g. MaloBacti™ AF3
 - Ferment the "MLF starter" for 24 - 48 hours and allow it to acclimatise
 - Do an analysis to determine the degradation of malic acid
- After the degradation of 1g/hL of L-malic, add the MLF "pied de cuve" to the tank pre prepared as per below

IMPORTANT: do not stir to allow cluster formation of the bacteria in the beginning

Preparation of the Tank

- Add 20 - 25g/hL ClearUp BIO to remove toxic fatty acids; rack it after 1 - 2 hours
- At a higher pH value, the pH should be adjusted down to at least pH 3.5 (to inhibit undesired strains)
 - Add 20g/hL complex nutrient. (MaloControl™)
 - Set the tank temperature to 17 - 20°C
 - Add the "pied de cuve" from above

For the identification of possible causes, first analyse the basic conditions in the young wine for inhibitory parameters for MLF cultures.

Parameter	Optimal Range	Critical Limit
Total alcohol	< 15 vol %	> 16 vol %
pH value	> 3.2 pH	> 3.1 pH
Total SO ₂	< 40 ppm	50 ppm
Total acidity	< 10 g/L	> 12 g/L
Malic acid	> 2 g/L	< 1 g/L
Lactic acid	< 3 g/L	> 3.5 g/L

