

# MLF MANAGEMENT IN WINES WITH A LOW L-MALIC ACID CONCENTRATION (< 1 g/L).

MLF can be complicated in wines with a low L-malic acid content because the bacteria do not have enough substrate, hence they struggle to grow.

## L-MALIC ACID CONCENTRATION < 1 g/L

Use the malolactic bacteria natural «reservoirs» of malolactic enzymes. Each bacterial cell contains a quantity of malolactic enzymes in its cytosol. Even if the cell fails to develop, these enzymes have a residual activity in the wine, and can be put to use.

In a conventional inoculation (1 g/hL of malolactic bacteria in a wine with a concentration of malic acid between 2 and 4 g/L) this enzyme activity is not sufficient to fully complete the MLF. The bacteria must first grow to produce a sufficient quantity of enzymes.

In contrast, when the concentration of L-malic acid is less than 1 g/L, the enzymatic activity of a malolactic starter is sufficient and proportional to the amount of bacteria used.

It is estimated that 1 g/hL of malolactic bacteria degrades about 0.3 g/L of L-malic acid. By using **MALOSTART**®, which provides essential cofactors for malolactic enzymatic activity (primarily  $Mg^{2+}$  and  $Mn^{2+}$ ) we optimize this rate of conversion.

2 g/hL of a malolactic starter + 20 g/hL of **MALOSTART**® are usually sufficient to degrade L-malic when the initial concentration is below 1 g/L, regardless of proliferation of the bacteria.

This practice is therefore the best solution to ensure completion of MLF in wines with less than 1 g/L L-malic acid.



## MLF PROTOCOL IN WINE BELOW 1 g/L L-MALIC ACID

**For 50 hL :**

### STEP 1 :

Preparation of the starter: Remove 2 bacterial sachets from the freezer and allow to warm to room temperature over the course of an hour. Rehydrate the 2 sachets (i.e. double the dosage) each for 50 hL of bacteria (**Lactoenos 450 PreAc®** or **350® PreAc**) in a mix of non-chlorinated water (2 L), wine (2 L) and the **ENERGIZER®** supplied with the bacteria. Wait 15 minutes.



### STEP 2 :

Add the bacteria and homogenize.

### STEP 3 :

After 6 h add the **MALOSTART®** (20 g/hL) and homogenize.



### STEP 4 :

Maintain the temperature at a constant level between 20°C and 25°C.

**NB :** *This protocol should be applied in the case of a wine whose initial content of malic acid is low (<1g/L). If MLF stops, apply the "MLF restart Protocol".*

