

## ENARTIS NEWS

### TAKING THE RISK OUT OF MLF

Malolactic fermentation (MLF) is the transformation of malic acid into lactic acid by lactic bacteria, particularly *Oenococcus oeni*. Wines that go through MLF become microbiologically stable as malic acid is consumed and can no longer be used by other microorganisms that can alter wine. Additionally, these wines are softer since lactic acid contributes less acidity. MLF also produces organoleptic changes that result in greater aromatic complexity and stabilization of wine color.

#### RISKS OF A SPONTANEOUS MLF

Due to climate change, wine pH is on the rise, helping the development of a greater diversity of microorganisms whose metabolism and influence on wine quality is not completely understood yet. As well as being a risk to wine quality, the development of these microorganisms also poses risks to consumer health, for example, the production of biogenic amines whose toxicity is amplified by the presence of alcohol. In this context, controlling MLF with selected strains of *Oenococcus oeni* provides technological security and assists winemakers by helping to control the timing of malic acid degradation and assures the production of a healthy, quality wine. By preventing the production of biogenic amines and off-flavors, the winemaker is assured of complexity, aroma and taste.

#### ENARTIS BACTERIA

Enartis strains are provided in a freeze-dried and pre-adapted form for wine. They have been selected and characterized to carry out MLF in a controlled and safe way. Each strain has different ideal conditions of growth. For this reason, the success of MLF depends on wine parameters and the choice of the most suitable strain, as well as the correct handling of the product and the addition of nutrients to favor the survival of the bacteria in a hostile environment such as wine.

#### NUTRIENTS FOR ML BACTERIA

Nutrition can be the key to a successful MLF, helping the domination of the selected strain over the wild population and providing necessary elements for a regular and complete MLF.

**Nutriferml Osmobacti** is a nutrient and regulator of osmotic pressure to be used at the end of the rehydration phase and prior to inoculation. It helps selected malolactic bacteria survive stress when inoculated in wine. Nutriferml Osmobacti increases the rate of surviving cells, thus allowing for a more rapid start of malolactic fermentation and helping the implantation of the selected strain over the wild bacteria.

**Nutriferml ML** is to be added to wine that will go through MLF. It provides all the nutritional factors that are necessary for a safe and complete malolactic fermentation. It's particularly recommended to promote malolactic fermentation in difficult wines.

#### PROTOCOLS FOR THE USE OF ENARTISML BACTERIA

Enartis has developed three protocols for the use of malolactic bacteria to be adopted according to fermentation conditions: normal, difficult and very difficult.

##### EnartisML Strain Technical Features

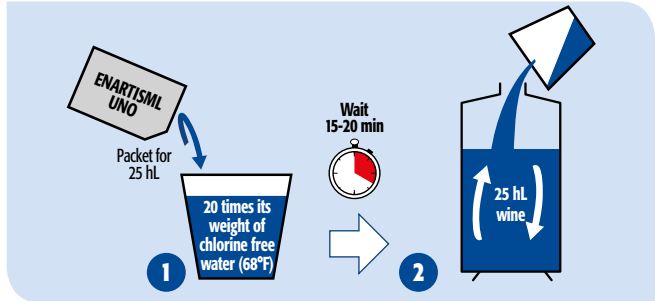
	EnartisML UNO	EnartisML MCW	EnartisML SILVER
Species	<i>Oenococcus oeni</i>	<i>Oenococcus oeni</i>	<i>Oenococcus oeni</i>
pH tolerance	> 3.3	> 3.1	> 3.2
Resistance to free SO <sub>2</sub> (ppm)	< 10	< 10	< 10
Resistance to total SO <sub>2</sub> (ppm)	< 40	< 40	< 45
Alcohol tolerance (% v/v)	< 14	> 15.5	> 16
Optimum temperature (°F)	68-77°F. Up to 80°F in coinoculation	61-73°F. Up to 80°F in coinoculation	68-77°F. Up to 89°F in coinoculation
Fermentation speed	High	Moderate / high	High
Sensory characteristics	Maintains color intensity; respects varietal aroma and olfactory cleanliness.	In white wine fermentation, produces butterscotch, sweet aroma. When used in barrel fermentation, enhances fruity aroma. Creamy palate.	Clean, floral, fruity and complex aromas; respects color; improves structure, volume and aromatic intensity.

## NORMAL CONDITIONS

pH	3.4 - 3.6
Temperature	64-71°F
Free SO <sub>2</sub> (mg/L)	< 5
Alcohol (%)	11-13

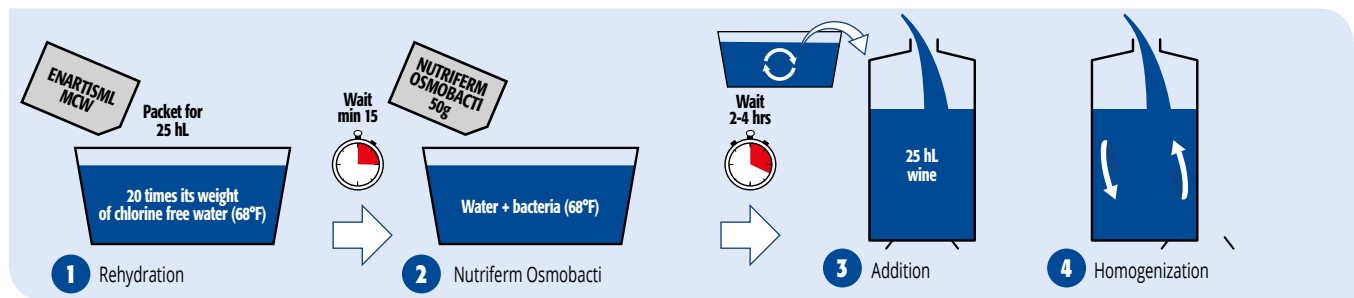
### Freeze-dried Bacteria

- Rehydration preserves a larger number of viable cells.
- Under normal conditions, it is possible to simply rehydrate bacteria and inoculate wine without necessarily using nutrients or adopting an acclimation procedure.



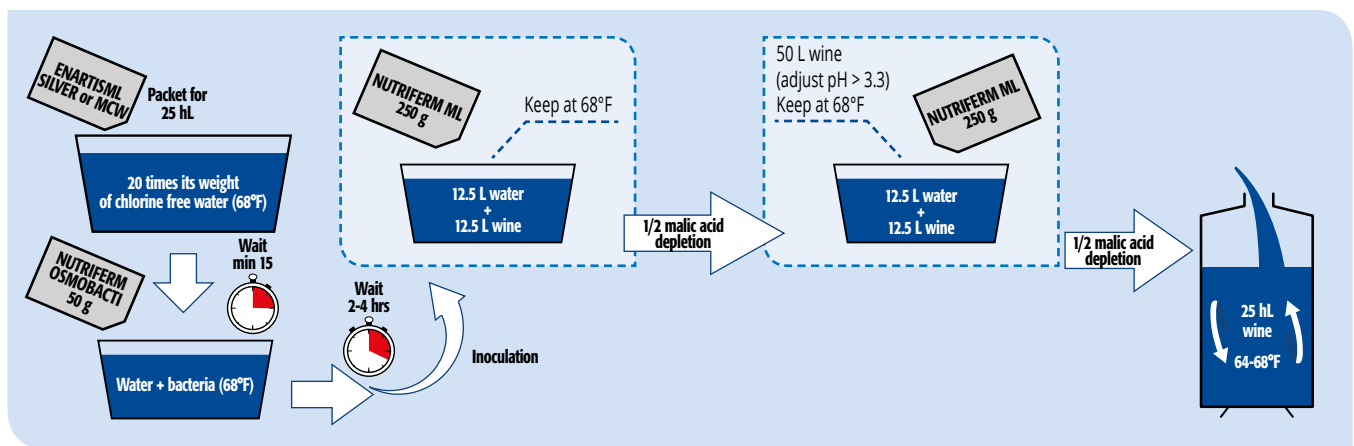
## DIFFICULT CONDITIONS

pH	3.2-3.4
Temperature	61-64°F
Free SO <sub>2</sub> (mg/L)	5-10
Alcohol (%)	13-15



## VERY DIFFICULT CONDITIONS

pH	3.0-3.2
Temperature	57-64°F
Free SO <sub>2</sub> (mg/L)	10-12
Alcohol (%)	15-16



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