SELECTED OENOLOGICAL BACTERIA

Malolactic fermentation: you decide when to start!

Perdomini IOC

Révelons votre différence

PERDOMINI- IOC OENOLOGICAL BACTERIA: CONTROLLING MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) has, for a long time, been considered as being a secondary phase in the winemaking process, and has often been neglected and entrusted to fate. In a number of different cases, this has resulted in being:

- very late (in spring for example) and with an uncertain outcome from a quality point of view (oxidation, aromatic masking and microbiological contamination).
- higher costs in terms of heating, analytical checking and management of the work carried out in the cellar.

Inoculation of oenological bacteria, obtained further to specific selection criteria, assists in controlling the malolactic fermentation process in such a way as to avoid said problems, both in terms of quality and costs.

CHOOSE THE BEST POSSIBLE OENOLOGICAL BACTERIA AT ALL TIMES

INOBACTER
Very acid wine (pH<3,2)

Suitable for a base wine, destined to be adopted in production in compliance with the traditional method and for very acidic red and/or white wine

The pied de cuve requires an acclimatization phase

Inability to produce diacetyl (aromatic pureness)

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NUTRIFLORE FML
The best possibility of survival under acidic conditions

NUTRIFLORE PDC
Best growth potential/adaptability during pied de cuve under acidic conditions

MAXIFLORE SATINE
Very high alcohol content (16% by vol.) and/or wine with a wealth of polyphenolic inhibitors

A high level of tolerance to ethanol

Limited nutritional requirements

Suitable for wine red with a high polyphenolic content

Various protocols of use according to the time of inoculation

1-STEP®

EXTRAFLORE
High alcohol content (14% by vol.)

Good ethanol tolerance

Easy to use (direct inoculation)

MBR process direct inoculation

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NUTRIFLORE FML
Limits toxic ethanol and the inhibiting effect of some polyphenolic fractions

WHAT WINES GENERALLY HAVE MORE DIFFICULTY IN STARTING SPONTANEOUS MALOLACTIC FERMENTATION?

Red wines produced from mature grapes with high potential alcohol: with reference to this type of wine, the most important inhibitor for bacterial activity is ethanol, which is very often associated with low nutritional substance values which are mainly consumed by yeasts.

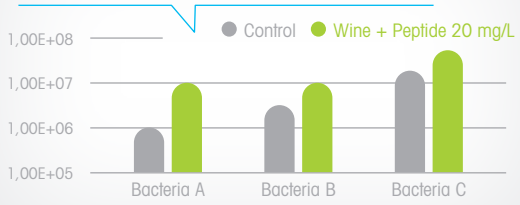
Red wines produced from grapes that have a wealth of polyphenolic inhibitors: recent studies have shown the impact of some polyphenolic fractions on the inhibition of bacterial activity. Some types of grapes, such as Merlot for example, are more "resistant" to starting malolactic fermentation compared to other varieties. Some practices, such as, for example, thermovinification, can greatly increase the extraction of these inhibitors.

Acidic white wine: the excessive activity, connected with a low pH (<3.2), result as being parameters limiting the development of spontaneous malolactic fermentation. In fact, the bacteria are incapable of dealing with the increase in acidity within the cell, during malolactic fermentation, and this leads to a higher mortality concerning the same. This is the case of a number of northern wines and sparkling wine obtained by means of the classic method.

IN WHAT WAY CAN THE SELECTED OENOLOGICAL BACTERIA RESOLVE THESE SITUATIONS?

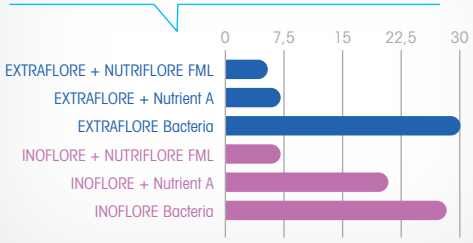
ACID STRESS: the oenological bacteria selected for white wine, as well as sparkling wine produced by means of the traditional method, are capable of resisting very well at a low pH. Through an acclimatisation process, their performance can be improved. The role of some specific peptides on the improvement of survival under acid conditions (Bou et al, 2014) has recently been evaluated, which has led to the development of some specific nutrients.

The effect of the addition of a peptide on the growth of 3 different strains of Oenococcus oeni in an acidic white wine (Chardonnay)
Bacterial population after 7 days of inoculation



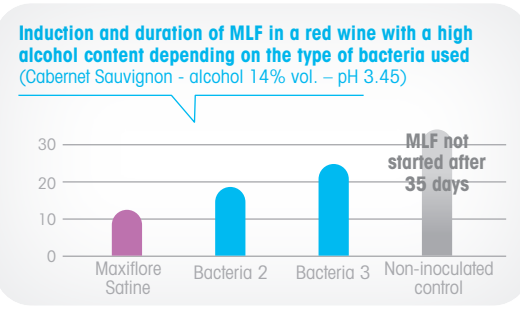
LACK OF NITROGEN: Oenological bacteria are characterised according to the amino acids quality requirements, some of which are fundamental for their growth (Remize et al, 2006). Besides these requirements, some specific nutrients derived from yeast can supply them with these amino acids, as well as minerals and vitamins.

Acceleration in the performance of MLF in white and acidic wine with NUTRIFLORE MLF
Malolactic fermentation duration (days)



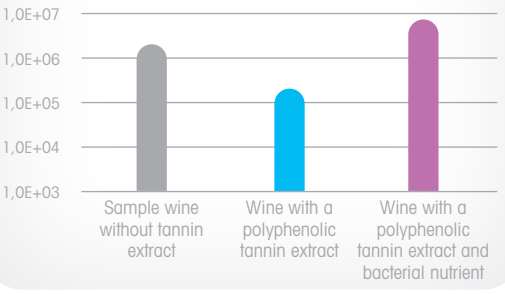
ETHANOL STRESS: the most recent selection criteria have enabled the development of a large number of oenological bacteria, which is much more resistant to ethanol. The acclimatisation of this oenological bacteria first (on the premises: the MAR® process, or more simply, in the cellar: MAXIFLORE), or after (by means of co-inoculation, at the beginning of fermentation) provides them with a greater chance of survival, in relation to this kind of stress.

Induction and duration of MLF in a red wine with a high alcohol content depending on the type of bacteria used
(Cabernet Sauvignon - alcohol 14% vol. – pH 3.45)



POLYPHENOL INHIBITORS: inactive yeasts, rich in polysaccharides, have enabled the inhibition of some of the grape's polyphenolic extracts (Lonvaud, 2013). The most efficient have therefore been selected to develop bacterial nutrients suitable for these situations.

Bacterial survival 5 days after inoculation – the effect of polyphenolic inhibitors and of a bacterial nutrient
Bacterical population (UFC/mL)



Various cases of delaying the start of malolactic fermentation are actually monitored thanks to our knowledge of the mechanisms in play and the specific differentiation of our oenological bacteria.

MAKE MALOLACTIC FERMENTATION SAFER TO PRACTISE

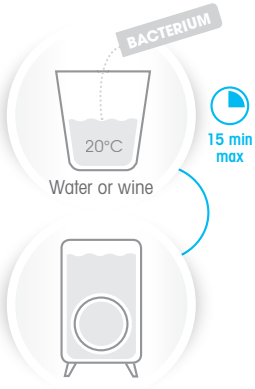
Thanks to the work carried out by our numerous partners, we are capable of offering a number of protocols for use, according to the conditions that arise, to achieve successful malolactic fermentation. These procedures have been implemented for a number of years for most grape varieties.

The specific nutrients are added to the wine 24/48 hours prior to bacterial inoculation.

Extraflore

Direct inoculation*

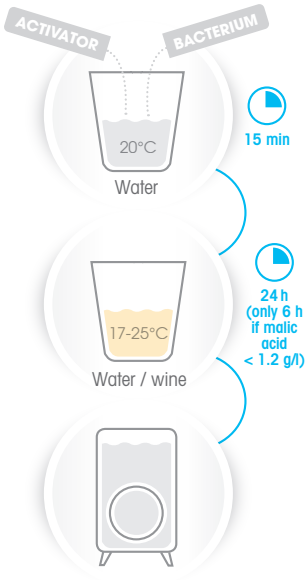
MBR process direct inoculation



Maxiflore Satine

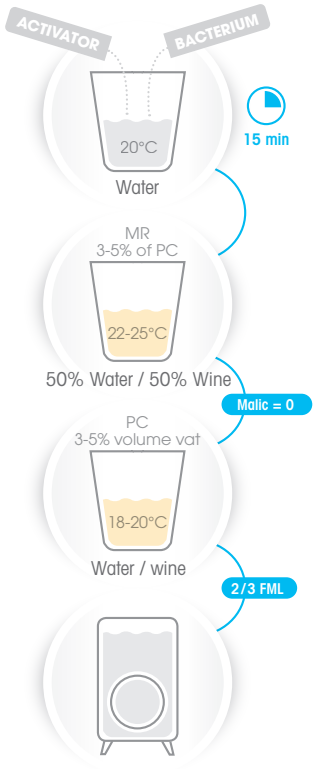
Inoculation with 1 acclimatisation step**

1-STEP®



Inobacter

Two-step inoculation (1 acclimatisation & pied de cuve)



With reference to starting the MLF, some specific situations continue to produce some downright dilemmas. In these cases, thanks to our experience, we can identify said obstacles and — dealing with your particular requirements — resolve them by means of specific protocols (detoxification, deacidification, feasibility tests …). Do not hesitate to contact your point of reference at Perdomini IOC.

* Rehydration is preferable to ensure successful dispersion of the bacterial population in the wine; however, direct inoculation is always possible by using good homogenisation.
** In the case of co-inoculation: simple reactivation in water, without acclimatisation, for approximately two hours.

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