

New Player

2B FermControl is a new player in the global market for malolactic starter cultures. The company was founded in 2003 by Carsten Heinemeyer, a former R&D and application scientist of Chr. Hansen. Since 2003 he developed new strains and applications for the malolactic fermentation. One milestone was the release of the first "citric acid" negative culture in the global market in 2004. This strain was developed in collaboration with Jan Clair Nielsen from VinoBios. Today 2B provides the second generation of citric acid negative strains and strains for specific flavour contribution and very high alcohol tolerance. 2B is now represented in almost all wine producing countries in Europe and overseas.

General

The malolactic fermentation (MLF) is a commonly used method to convert the aggressive malic acid to lactic acid. But the potential application goes far beyond the pure conversion of malic into lactic acid. It's today a winemaker's desire to enhance or preserve the fruity varietal character of the wine. They wish to avoid the lactic notes without losing the other benefits of the MLF. In aromatic wines, such as Pinot Grigio or Arneis, the MLF character overlays the varietal character which is not desired. The focus of the 2B research is finding MLF starter cultures that have a positive aromatic impact on the wines.

The current range of MLF starter cultures consists of three commercial available strains:

- MaloBacti™ CN1 - citric acid negative strain
- MaloBacti™ HF2 - for aromatic white and red wines up to 16%vol
- MaloBacti™ AF3 - for high alcohol and phenol content up to 17%vol

Each strain has specific physiological features which will contribute to the flavour profile or varietal character of the wines. During the MLF *Oenococcus oeni* doesn't convert malic acid only into lactic acid, numerous amounts of aroma active by-products will also be produced that contribute to the wine flavour. Furthermore each strain has different tolerances towards the main inhibitory parameter which influences the activity of the strains. These parameters are listed according to their influential force:

Total SO₂; pH; alcohol level; Temperature. Considering all these influential parameters, we can generate an individual *activity window* for each strain, where the winemaker can easily identify the suitable strain for various conditions in the wine.

The ellipses in Fig. 1 represent each a single strain of MaloBacti starter cultures. The ellipses describe the range of influential parameter such as pH, SO₂ and temperature tolerance where each of the strains can perform reliably.

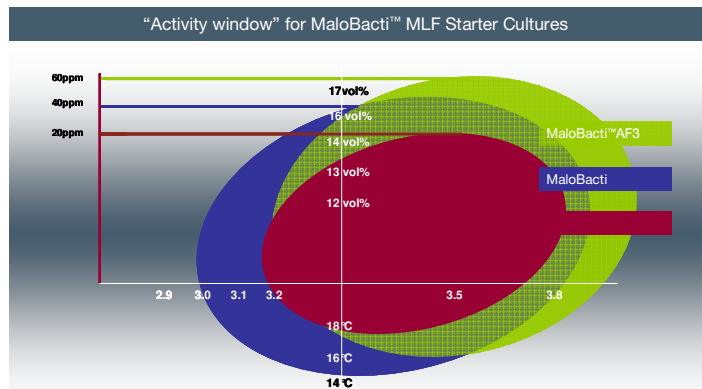


Fig.1, Graph that illustrates the optimal activity window of 3 MaloBacti cultures /Source 2B 2010

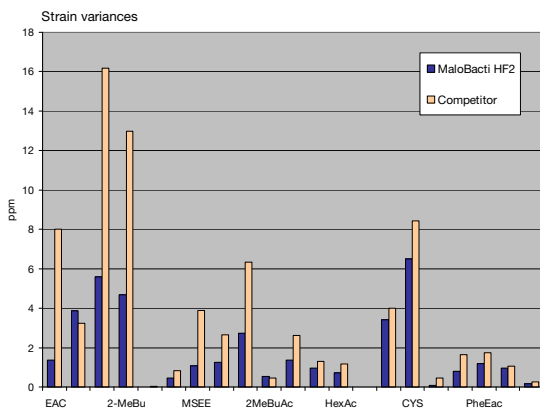


Fig.2, Comparison 2 MLF strain on yield of metabolic by-products Source C.Heinemeyer 2007

Aroma profile of MLF

To avoid lactic notes many studies and field trials have been conducted. The producers of MLF starter cultures tried to solve this demand by new selections of MLF starter strains. Fig.2 shows a comparison between MaloBacti™ HF2 and a competitor strain in regard to the yield of aroma active compounds in a similar base wine. It becomes obvious that MaloBacti™ HF2 produces less of these by-products than the competitor strain. As an example the yield of EAC (ethyl acetate) is 1,75 ppm where the competitor's yield is 7,9 ppm. The low formation of these compounds lead to cleaner expression of the varietal character. MaloBacti™ HF2 and AF3 were selected with this analytical tool in order to receive MLF cultures with a defined flavour profile. HF2 preserves the varietal character and AF3 ensures a savoury character in high phenol and high alcohol wines.

The best known flavour compound derived from the MLF is diacetyl which gives buttery notes to the wines. Diacetyl will be produced during the MLF by the conversion of the natural citric acid in wine by *Oenococcus oeni*. The MaloBacti™ CN1 is a second generation citric acid negative strain. The culture degraded the malic acid as all other standard strains but it doesn't touch the natural level of citric acid in the wines. By not having the citrate metabolism during the MLF, the wines will preserve the varietal and fruity character without the typical lactic notes from a standard MLF. An additional benefit of the citrate negative culture is the significant low formation of volatile acidity.

Practical application – New +A³ Technology

Today the practical applications of malolactic starter cultures are divided into two groups. On the one hand we have the widely known direct inoculation cultures. They come as freeze dried product or frozen product. The other cultures are so called reactivation cultures which need a rehydration step in advance. Both systems anticipate that the culture will survive when they will be inoculated in the wine or simultaneously to the alcoholic fermentation. It's a fact that both systems expose the cultures to a huge pH shock. The pH of the freeze dried product is about 5,5 pH. By adding cultures directly to the wine, the bacteria cells have to overcome the immediate shift in pH to the wine pH which is about 3,5 pH in average.

2B has developed a new application method which is a combination of reactivation and additional adaptation method for the bacteria before they will be inoculated in wine. The technology is called +A³. The bacteria will be suspended in pure non chlorinated water

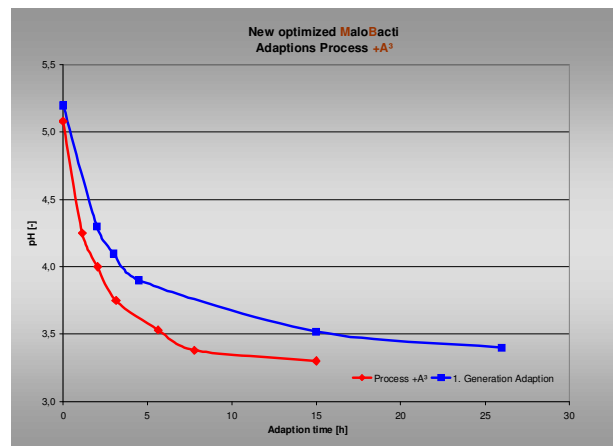


Fig.3, pH evolution of the new +A³ generation method.

together with the reactivation and adaptation media. At the begin the pH is similar to all other cultures round about pH 5,5. Within 8 to max. 12 hours the pH in the bacteria suspension drops to lower than 3,6 pH. The bacteria become activated and will already be adapted to the pH in wine conditions. We can anticipate a semi direct inoculation of the bacteria after a proper adaptation to wine condition. The result is a reliable start of the MLF and no significant loss of active cell count.

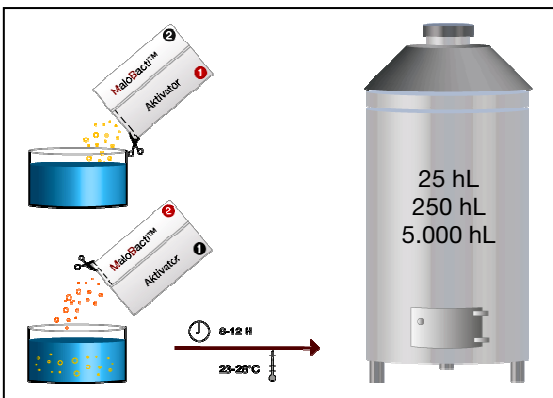


Fig.4, Practical application of the semi direct inoculation

The standard packing of all MaloBacti™ cultures is a double chamber pouch. Chamber one contains the adaptation media, chamber two bacteria concentrate. The separate packing enables improved temperature stability for transport and storage.

All MaloBacti™ MLF cultures are available in three different packaging: 25 hL, 250 hL and 5.000 hL. The third packaging is specially designed for big volume producers. The so

called MaxBacti pack contains the same bacteria cultures with the +A³ technology as all other MaloBacti™. But the costs for big volume producers can be brought down to 1,20 Euro per hectolitre of wine. The application and handling is as easy as for MaloBacti™. The MaxBacti pack comes in 5 single double chamber pouches for 1.000 hL each. The storage during vintage can easily be in a fridge. For left over pouches a simple freezer is required.



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