Co-inoculation reveals its strengths...

Tested and approved by winemakers from all over the world for the last 10 years,
co-inoculation (bacteria inoculation 24-48 hours after yeast inoculation in must)
is a simple and effective winemaking option with economic and qualitative advantages !

UNITED STATES
FRANCE
ITALY
PORTUGAL
CHILE
Dominique Delteil

SPAIN
Béquer Prieto

SOUTH AFRICA
Abrie Beeslaar

FRANCE
Laurent Cassy

CROATIA
Tomislav Plavsa

ITALY
Stephan Filippi

Lallemand speaking

"After several years of research on bacteria and on timing of inoculation, in collaboration with research centers and technical institutes, co-inoculation is now recognized as a simple and safe practice for the management of malolactic fermentation for wine quality optimization".

Involved in the wine bacteria production since the mid-80s, Lallemand dedicated its research effort on the topic of co-inoculation to understand how it could benefit wine quality.
When evaluating co-inoculation with the lactic acid bacteria *Oenococcus oeni*, the fear of high volatile acidity production or a possible "competition" between yeasts and bacteria were often cited as reasons not to use this practice.

With that in mind, the procedure was optimized to make it trouble free, as well as reassure winemakers that under well managed alcoholic fermentation, with proper temperature management, nutrition, sulphite, pH, etc..., co-inoculation is a powerful tool to enhance wine quality.
Our research confirms that there is no excess production of acetic acid during malolactic bacteria growth and malolactic fermentation.

There is no significant difference in the final concentration of acetic acid with the different timing of malolactic bacteria inoculation. A clear benefit of co-inoculation is that it does not mask the grape varietal character but even enhances the fruity characters of wines. Winemakers using co-inoculation in their wines are now using it with confidence.

After 15 years of studies with researchers and trials with wines from all over the world, co-inoculation is as reliable practice as sequential malolactic fermentation, offering qualitative and economic advantages recognized by the profession.
Our range of bacteria of *Oenococcus* are adapted to different pH conditions and winemaking process and will optimize and stabilize the sensory characteristics of the wine.
It is very important to choose the best least/bacteria couple.

Plan your co-inoculation: the benefits of earlier malolactic fermentation

Save time

- Malolactic fermentation is faster than post alcoholic fermentation inoculation or spontaneous malolactic fermentation.
- Increasing the chance of a successful malolactic fermentation under difficult wines conditions.

Up to 12 weeks without risk of high volatile acidity production

Preserve Quality

1. Save all the efforts done before malolactic fermentation step

- Secure and control the fermentation process.
- Better microbiological management: preventive control of indigenous micro-organisms.
- Wines are stabilized earlier (helping to prevent *Brettanomyces* and other spoilage organism development).

2. Preserve the aromatic quality of wines

- Management of buttery characters (diacetyl).
- Limits biogenic amines production and wines faults.
- Protect and enhance intensity, complexity and aromatic characters of the wines.
- Better aging management.

Save costs

- Reduces energy cost for tank heating.
- Able to benefit from the winter's cold temperature for post fermentation management since malolactic fermentation is already completed

save more than 2€/hl

- Better resources management: save staff and cellar work.
- Wines can be released on the market earlier.

save 1 to 3 months

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No need to be afraid of co-inoculation anymore !

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Winemakers are the ones who know **co-inoculation** *the best !*

I believe that co-inoculation fits perfectly with the early construction of a stable colloidal matrix.

The best way to see how efficient it is, is to try it.

Dominique Delteil
INTERNATIONAL CONSULTANT
US, France, Italy, Portugal, Chile...

Since when have you been using co-inoculation?

I have been prescribing yeast-bacteria co-inoculation since 2006.

Why are you using co-inoculation?

• Sensory quality and consistency for a specific wine style. This point is the key and the original goal of co-inoculation.
• The rapid completion of malolactic fermentation with a correction of the pH (target pH below 3.5) and high alcohol potential (> 14% vol)
• Microbiological purity

For what style of wine?

My clients were willing to try co-inoculation on Pinot Noir in northern Italy and Chile. Co-inoculation can develop intense fresh fruit aromas which enhances minerality during the first weeks of elevage.
Even on Merlot grapes, which is known for having difficulty going through malolactic fermentation when it is fully ripe, co-inoculation allows a reliable and faster malolactic fermentation: the aromatic and organoleptic qualities are built upon maceration. The early addition of SO_2 at the end of malolactic fermentation is a major asset in order to fight against contaminants: *Brettanomyces, Pediococcus, Lactobacillus,* etc...

Co-inoculation is a very interesting technique for Syrah and Tempranillo in southern Italy and Portugal on short maceration to develop stable mineral fruit aromas instead of negative aromas known to develop in hot climates.

On Pinot Blanc, Chardonnay and Sauvignon from northern Italy, I use it to develop longevity, reduce the risk of "pinking" and negative diacetyl lactic aromas; co-inoculation is a powerful tool even on Pinot Blanc with pH 3.3 and 15% alcohol level!

Laurent Cassy
WINEMAKER
Château Chillac, Morizes, Gironde, France

Château Chillac produces approximately 1500 hL of red Bordeaux (Merlot, Cabernet Sauvignon, Cabernet Franc, Petit Verdot and Cot). Two terroirs were identified and therefore we produce 2 different wines. The first wine is rather fruity, with "merlotées" notes and a profile "red fruits" while the second wine has rather a «dark fruit» profile with a good length and more structure.

Since when have you been using co-inoculation?

It's been 5 years since I use co-inoculation. At first, I did some tests on one or two tanks, and today it is a method I use on a lot of my tanks.

Why are you using co-inoculation?

• I realize big savings on heating these tanks because we can use the heat from alcoholic fermentation.
• Co-inoculation allows faster malolactic fermentation: I think the time saving is from 5 to 7 weeks.
• Since malolactic fermentation ends earlier, I use the first natural cold weather for decantation post-malo.
• On difficult terroirs where it is often over-ripe, or in cases where the risk of developing unwanted yeast or bacteria contaminants is important, co-inoculation brings me a significant security.
• As in any fermentation management, we have to be careful about volatile acidity increases, but even on difficult vintages, I have never encountered this problem on my co-inoculation tanks.

For what style of wine?

I practice co-inoculation to obtain more fruity wines. The result is better protected and stable fruit in my wines. This also allows me to have wines ready to drink earlier in the season. This can have a significant commercial impact.

I think co-inoculation is a technique to make wine more peacefully and "pull" a better part of the raw material that is pampered all year: so why deprive a technique that promotes secured vinification and moreover that saves energy.

Stephan Filippi
WINEMAKER
Cantina Produttori Bolzano, Italy

Cantina Produttori Bolzano manages grapes coming from roughly 330 hectares, 60% planted with red varieties such as Lagrein, Schiava, Cabernet Sauvignon, Merlot and Pinot Noir and 40% with white varieties such as Pinot Bianco, Pinot Grigio, Gewürztraminer, Chardonnay, Muller, Thurgau and others.

Since when have you been using co-inoculation?

We started 4 years ago, and today we are using co-inoculation for 100% of the red wines and, depending on the year, for 5-10% of the white wines.

Why are you using the co-inoculation?

• The goal of co-inoculation is to produce fruit-driven wines and to reduce the lag-phase between alcoholic and malolactic fermentation, a step where the wine is not protected due to the low SO_2 concentration. The protection with SO_2 is particularly important in an area like Bolzano with a hot climate area and light soils which lead to high pH.
• In case of natural low temperature after alcoholic fermentation, co-inoculation is a good tool to secure malolactic fermentation and respect the fruitiness of white wines.
• The wines are fruity and clean. A lower content of volatile acidity is another benefit of this technique: a reduction in the average volatile acidity of 0,2 g/L after malolactic fermentation was observed (we end up with a total volatile acidity at 0,40-0,45 g/L after one year of barrels aging). The compatibility of yeasts and bacteria strains is also very important to manage this parameter and avoid any risk of stuck fermentation.
• With co-inoculation, we have eliminated all the problems during oak/wood aging.

For what style of wine?

Our whites are fruity, elegant, fine: the key characters for Alto Adige's wines success. Also for most of our reds fruitiness and elegance is more important than structure.

The important advantage of co-inoculation is that the entire winemaking process is accelerated and cellar management becomes easier, faster and more precise.

I am very happy with the outcome of co-inoculation.

Abrie Beeslaar
WINEMAKER
Kanonkop Estate, Stellenbosch, South Africa

Since when have you been using co-inoculation?

I have tried the co-inoculation of malolactic bacteria for the first time the past 2011 vintage.

Why are you using co-inoculation?

• Alcoholic fermentation proceeded to completion without any problems with this technique.
• Malolactic fermentation finished within a four week period which was much quicker than I was used to.
• If I had to follow normal procedure, this specific wine should have had two rackings. Now, in my opinion only one is needed before going to barrels.
• The volatile acidity was 0.5 g/L which is in line with what I normally get.

For what style of wine?

Another outstanding aspect is that the fruit of the wine was more pronounced comparing to traditional post alcoholic fermentation inoculation.

Co-inoculation is a very interesting "story" for young red wines with enhanced aromas. I recommend it.

Tomislav Plavsa
INSTITUTE OF AGRICULTURE AND TOURISM
Porec, Croatia

Teran is an indigenous Croatian red wine. It is characterized by high total acidity (9-13 g/L) including 30-50% of malic acid and low pH value (typically about 2.95 to 3.0).

Since when have you been using co-inoculation?

Co-inoculation is used now for the last 5-6 years.

Why are you using co-inoculation?

• I noticed no stuck / sluggish alcoholic or malolactic fermentation and no negative impact such as high volatile acidity nor competition between yeasts and bacteria.
• The wines were full body, rounded, with pronounced aromas of cherries, raspberries, plums and blueberries. The fragrance is persistent with high intensity.
• Energy saving is observed (to carry out malolactic fermentation, we use temperature liberated during alcoholic fermentation) and the wine was ready for market faster (after 3 months).

For what style of wine?

Mostly in the production of red wines, regardless of the style of wine (intended for aging or not).

You can get noticeable quality improvements with co-inoculation. With the same type of grape and similar conditions, the results are highly satisfactory.

Béquer Prieto
WINEMAKER
Bodegas Vizar, Valladolid, Spain

The region of Ribera Del Duero, with the powerful Tempranillo, has high concentrations of total polyphenols, even a tendency to over-ripe. In our case we are looking for fruit above all, easy to drink and fresh wines. One of our most important export client needed wines in the first week of December with this profile.

Since when have you been using co-inoculation?

Co-inoculation is used since 2009 on 50% of our wines in order to have young red fruity wines ready for the market in December.

Why are you using the co-inoculation?

• Rapidity.
• Energy saving (lower consumption in heat / use the natural cold to clarify).
• Lower levels of SO_2.
• Increase of the aromatic potential.
• Preservation of colours.
• The first year, we encountered a volatile acidity increase (0.56 g/L) but this year has been the opposite, we have been producing wines with 0.11g/L of volatile acidity, although the average has been of 0.26 g/L which is inferior to the sequential inoculation. Two important factors played: the temperature was lower thanks to a better temperature management and oxygen addition during alcoholic fermentation.