WEBINAR, MAY 2020, Q&A

THE MLF TOOL BOX AND MAGIC NUMBER

You had mentioned biogenic amines in wine, histamine being in the highest concentration in wine. Are biogenic amines a risk factor for malolactic fermentation (MLF) in general? If the wine does not go through MLF, does that mean the wine has a lower potential biogenic amine concentration in the wine?

Histamine is the most allergenic provoking biogenic amine.

The malolactic bacteria (MLB) and the process of MLF are the main contributors of biogenic amines in wine. There are other contributors of biogenic amines like the presence of molds on grapes before the start of fermentation, but MLB are the main contributors. Spontaneous fermentations are a risk for increase biogenic amine conecentrations because the winemaker is unaware of the potential bacteria strains that could be increasing biogenic amine concentration.

If MLF is not completed, the biogenic amine concentration is probably less of a risk, minus the potential during the start of fermentation in which native strains could contribute to biogenic amine production.

What wines require MLF in general?

This is determined by the desired wine style and whether modifying the acidity is important.

Most reds benefit from MLF to reduce the harshness contributed by the acid.

There are styles that desire the flavors of MLF (*e.g.*, buttery Chardonnay).

Another trend in Europe is minimizing sulfur dioxide concentrations in finished wines. If you start to lower the sulfur dioxide, the winemaker must manage MLF otherwise it can happen spontaneously, either before or after bottling. Thus, inoculating for MLF eliminates the possibility of MLF progressing in bottle under low sulfur dioxide conditions.

Could you talk about best practices with co-inoculation of MLB with yeast?

Co-inoculation is all about the wine and not about the bacteria that is used. If there are harsh conditions (*i.e.*, low pH, high potential alcohol), then co-inoculation is a good idea.

We also recommend if you have an intermediate pH, then you can do a later co-inoculation (after 2/3 of fermentation is complete) when the temperature of alcoholic fermentation decreases, the MLB can be added. It's important to remember that we prefer you add the bacteria when the alcoholic fermentation goes below and stays below 77°F.

How is your product packaged? Is it available for small batch sizes?

Yes, our smallest pack size is for 250 L, meant for barrel (it's the freeze dried bacteria). The largest size can inoculate 6,600 gal.

Can you go over what conditions can cause fatty acid inhibition? What can be done to prevent it?

This is actually caused by the yeast. It could be that you have the wrong yeast selection for the wine conditions, and then the yeast produce fatty acids. And yeasts usually produce fatty acids under very stressful conditions.

First, look at your yeast strain. And then look at the conditions for having a healthy alcoholic fermentation to prevent fatty acid formation.

Are some MLB strains better matched with yeast strains?

Yes, there is variation in compatibility, but there is so much variation in which strains match. It is something to be aware of, in general, about having good compatibility.

All of our yeast are compatible with all of our bacteria.

One of the goals of adding YAN at one-third sugar completion is to "use up" amino nitrogen (N) so the yeast won't bypass it for YAN early on and ultimately leave it behind. Does that technique affect availability of amino N for MLF?

Bacteria do not need a lot of nitrogen, and they tend to need smaller peptides that most yeast are not interested in consuming, in general. Of course, there is some variability in yeast strain consumption,

but you do not need to look for a specific YAN with regards to MLB. If you see you are having issues completing MLF, it's possible you need to consider nutrient supplementation for the MLB.

When should MLB nutrients get added? Just in the beginning of MLF? Or also midway through?

Chr. Hansen recommends only adding MLB nutrients at the beginning of MLF, when bacteria is added. If doing a co-inoculation, you can wait until the end of alcoholic fermentation and see if a nutrient addition is needed.

If you co-inoculate at day 2 of primary fermentation, and the wine temperature rise above 77°F during the primary fermentation, and MLF stops, will MLF start again when the temperatures reduce as the primary fermentation progresses?

The alcohol and temperature stress starts above 8% alcohol. So if you get above 8% alcohol and the temperature rises above 77°F, then you are actually killing the *Oenococcus*. Thus, the MLF won't start again. And if it does starts again, you can't be sure it's the bacteria strain that you added that is conducting the MLF. It's worth mentioning that there are some strain variations associated with MLB sensitivity to alcohol concentration and temperature sensitivity. In this case, if you know that these stressors may occur, then it's worth reviewing which MLB strain is being selected for the wine.

Also, this is a good opportunity to remind winemakers how important daily data indicators are while fermentations take place to know when something is going awry.

What do you do if the wild MLF starts before you had a chance to inoculate with Viniflora?

This is especially common in warmer climates.

What you can do is provide a low dosage in the beginning of the spontaneous MLF to gain control of the MLF.

Also, the U.S. market will soon have access to a *Lactobacillus* strain from Chr. Hansen, and the purpose of that strain is to regain control of spontaneous MLF.

Does Chr. Hansen recommend co-inoculation (of yeast and bacteria) or sequential inoculation as a rule for their bacteria? (As context, may experts recommend co-inoculation in stressful, disease-ridden years. But there is also some evidence to show it can help enhance the fruity characters of wine, especially red wines.)

It depends on the wine and what fits the wine. There are positive benefits of co-inoculation, especially with the late co-inoculation because you can ensure there is no gap between the two fermentations. With that said, you have to have good conditions for co-inoculation; you want to avoid too easy of an MLF that goes too fast and finishes before alcoholic fermentation.

With our strains, you are still getting a time sensitive MLF completion rate, regardless of when the strain is added. If you use an MLB product with lower initial cell counts, then the MLF can take longer in a sequential setting.

Do you recommend Lysozyme treatment at the end of MLF?

No, it is not normally necessary. In most cases the bacteria will die out by themselves.

Why would you want to stop the natural MLF if it occurs?

One thing is about the speed. You have no idea how fast or slow MLF will be.

But the main concern is the biogenic amine concentration. Without picking an MLB strain, winemakers do not know what is in there, to what level histamine is produced, and that's what people are allergic to.

Consumers are becoming more and more aware of histamines in wine. There is a Norwegian brand that actually says on the wine, "No Histamine." If a spontaneous MLF occurs, there is a pretty good chance of having biogenic amines in the wine.

Of course, there is also the flavor point. It's possible to get flavor issues from spontaneous MLF.

That's not to say there aren't great wines made from spontaneous MLF, but it comes from experience and knowledge associated with the microflora of the wine. It's something not all winemakers may be able to obtain or feeling comfortable doing in the winery.

Also remember that inoculating for MLF is still a fairly new practice. Yeast inoculations have been available from the 1970's. MLB inoculations have only been available since the 1990's. So MLF inoculation is a bit behind the practice of using yeast inoculations.