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Inoculating
with Yeast
to **Acidify**

Inoculating with Yeast to Acidify

A non-*Saccharomyces* yeast can acidify white and red musts by converting a small amount of sugar into lactic acid at the start of alcoholic fermentation. This is a new way to acidify wine.

It has become common practice in the south of France to acidify musts, often with tartaric acid – the cheapest solution. But last year, an alternative appeared in the form of Laktia. This non-*Saccharomyces* yeast converts a few grams of sugar into lactic acid at the start of alcoholic fermentation (AF), before disappearing. “It’s a more natural acidification,” said Louis-Michel Musyt, who is in charge of Château Carbon d’Artigues in the Graves wine region.

IN WHITE MUSTS

As a Basis for Blending

Advised by Marie-Laurence Porte of the Enosens Laboratory in Cadillac, Louis-Michel Musyt tested Laktia in 30 hL of Sémillon this year. The test was, to say the least, spectacular since it obtained a Sémillon with a pH of 2.9 and total acidity (TA) of 10 g/L whereas the control had a pH of 3.35 and TA of 4 g/L. “We inoculated with a *Saccharomyces* yeast 72 hours after adding Laktia whereas it is recom-

mended waiting 48 hours”, admitted the oenologist. “But at least we saw that it worked well! Once it started, it didn’t stop until reaching an alcohol level of 8%,” he added.

For their first trial in white must, Musyt and Porte closely monitored the tank. They soon noticed that Laktia was heavily acidifying the medium. Sulphiting to stop it was out of the question since AF was in progress. “The only method was cold treatment. We cooled the tank to around 14-15°C. This stopped Laktia but not the *Saccharomyces*, which continued to ferment,” said Porte.

In total, Laktia produced 9 g/L of lactic acid, which is a huge amount! There is a marked difference in taste. “The Sémillon made with Laktia has a more lemony flavor. It is much tighter but too acidic to be of interest on its own. We are going to blend it with a fuller-bodied Sémillon to obtain a more balanced blend,” said Musyt.

Last year, Stéphanie Marquier – winemaker at Mas de la Chevalière in Béziers – observed something similar, although less extreme, in 40 hL of Chardonnay. “The TA of this wine increased by 0.8 g/L and its pH dropped by 0.1. To taste, it seemed more acidic and mineral. Since we didn’t have enough volume to make a



LAKTIA, a non-*Saccharomyces* yeast, is a promising natural acidifier. © GUTNER

vintage in its own right, we blended it,” she said. Mas de la Chevalière produces 10,000 hL of Chardonnay a year. Marquier has not repeated the experiment this year: “The cost of this technique is not insignificant (see insert). But it’s an interesting alternative. I’m thinking about identifying some higher quality parcels to try it again.”

In Alsace, acidification is still banned. “And yet, Gewurztraminer really needs it,” said Alain Freyburger – winemaker at Domaines Schlumberger in Alsace. Since he cannot acidify, Freyburger turned to Laktia to pep up his very aromatic vine variety. “It generally has a pH of 3.8 and TA of 3.6 g/L. Using this non-*Saccharomyces* yeast, I managed to

An Acidifying Yeast

Laktia is a non-*Saccharomyces* yeast of the *Lachancea thermotolerans* species. “It was selected in La Rioja, Spain in 2016. The aim was to find a natural acidification method for this region, which has slightly acidic reds,” said Anthony Silvano of Lallemend, the company that developed this yeast. Laktia converts sugar, especially glucose, into lactic acid. It significantly increases the pH and total acidity of musts. But it consumes a lot of nitrogen. “It consumes 60-80 mg/L in the first three days following inoculation,” continued Silvano. As a result, it should be used in musts containing at least 150 mg/L of assimilable nitrogen or with appropriate nutrition management. It is inoculated in a very similar way to a *Saccharomyces*, except that it needs to be rehydrated at approximately 30°C rather than at 37°C, after which it is added to the must. Inoculation with *S. cerevisiae* is done 24 to 72 hours later. Since Laktia has low alcohol tolerance, it starts dying from 3% strength by volume and stops production of lactic acid.

For Reds, But Tested in Whites

Laktia’s product technical data sheet only mentions its use in red musts. But according to empirical tests conducted by oenologists and wine growers, this yeast is also effective in whites. Furthermore, it does not seem to produce milky notes, as might be expected given that, like lactic acid bacteria, it produces lactic acid. “It seems to work better when the pH is high – around 3.6 – and does not consume as much nitrogen as in red musts,” added Marie-Laurence Porte. “After tests and feedback from wine growers in France, Spain and Italy that we’ll be receiving this year, we’re going to better define the specifications for its optimal conditions of use in whites and rosés,” said Silvano of Lallemend.



lower the pH to 3.37 and the TA to 6.1 g/L in a small 40-hL tank," he said delightedly. But the aromatic profile was modified. "You can taste a lot of citrus notes, which I'm not looking for in this vine variety. This batch will be ideal for blending and enhancing a rather flabby but more typical Gewurz, with a rose and spicy profile," he said.

In the future, Freyburger is thinking about making 20% of his 1,200 hL of Gewurztraminer using Laktia, to obtain a typical – but fresher – blend for this vine variety. "I'm prob-



"The batch acidified with Laktia will be ideal for blending with a rather flabby Gewurz."

Alain Freyburger, winemaker at Domaines Schlumberger, en Alsace. © DOMAINES SCHLUMBERGER

bably also going to try it on a Pinot noir since this variety easily reaches pH 3.8-4," he said.

IN RED MUSTS

Fruiter and Less Sulphur

Before his trial in white musts, Musyt tried his hand with reds. He tested Laktia in a 200-hL tank of Merlot, Cabernet and Carmènere in 2018, and then in a 350-hL tank in 2019. He started from the idea that his wines would be less sensitive to microbial deviation if they were more acidic.

The results were similar in both years. "In 2018, the pH of the control wine after AF was 3.8 and the TA was 3.6 g/L. This compared to a pH of 3.6 and TA of 4.9 g/L for the wine made using Laktia," said Porte. The yeast produced 3 g/L of lactic acid from a few grams per litre of glucose/fructose. "Unfortunately, the alco-



"Decreasing the wine pH allows also to decrease SO₂ addition because it's more active when pH is lower."

Marie-Laurence Porte, oenologist at Enosens Laboratory in Enosens de Cadillac.

hol content by volume did not drop and was 15% in both cases," said Porte. To taste, the wines made using Laktia seemed rounder and fruitier than the controls. "The preliminary results show that they contain two to four times more esters with red fruit aromas than the controls," continued Porte.

"In the first year, I was slightly concerned at the start of fermentation since there was a strong smell of cheese in the winery. But there was no need to worry since it had no consequences. I experienced the same thing this year," recalled Musyt. Alcoholic fermentation occurred without any hitch. The fermentation temperature – approximately 23°C – and the increasing alcohol level stop Laktia naturally. "You just need to check that the lactic acid stays under 5 g/L or else it can eventually block malolactic fermentation."

In 2018, Musyt created a sulphur-free vintage using 1.5 hL of wine made with Laktia and blended the rest. "Reducing the wine's pH is beneficial for combatting the development of Bretts," added Porte. "This also helps reduce SO₂ doses since it is more active when the pH is low. It's therefore a good tool to make wine with less, or even no, sulphur," she concluded.

CLAIRE FURET-GAVAILLET

The Cost is Holding Back Some Winemakers

At the recommended dosage of 25g/hL, the price is 2 to 3 times higher than the price of tartaric acid addition per hL, depending on the vintage. "Due to its high price, we haven't used Laktia again this year," explained Agnès Arguier, production manager at Dom Brial winery (Pyrenées-Orientales). Nevertheless, she is delighted with the results obtained last year in 250 hL of thermovinified Grenache. "I thought it was more complex than the control, with more developed fruity and amylic aromas," she said. As well as acidifying and improving the wine's profile, the yeast reduced its alcohol level. "The control was 12.8% strength by vol. whereas the wine made with Laktia was 12.5%," she added. But that was not enough. "Laktia presupposes double inoculation with yeast, which for practical reasons I can't integrate into our protocols," she said with regret.



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Laktia™ is a natural alternative for acidification. Laktia™ is a pure culture of *Lachancea thermotolerans*, selected by Lallemand Oenology for its unique properties to produce high level of lactic acid during fermentation. Used in sequential inoculation with most selected *Saccharomyces cerevisiae* yeast for red winemaking, Laktia™, by producing significant level of lactic acid, is a natural tool to enhance roundness and more balanced red wine.

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