

MALIC ACID CONSUMPTION BY WINE YEAST

research information

1g/l malic acid = 0.03% alcohol

Wine yeast have the capacity to metabolise malic acid during fermentation. This consumption first starts with the diffusion of malic acid into the cell. Once inside the cell the acid is decarboxylated to pyruvate and then to acetaldehyde. This acetaldehyde is then reduced to ethanol. The consumption of 1g/L of malic acid yields only a very small increase in ethanol of 0.03% (v/v). The amount of malic acid consumed during fermentation is strain specific.

Yeast with a high capacity to consume malic acid

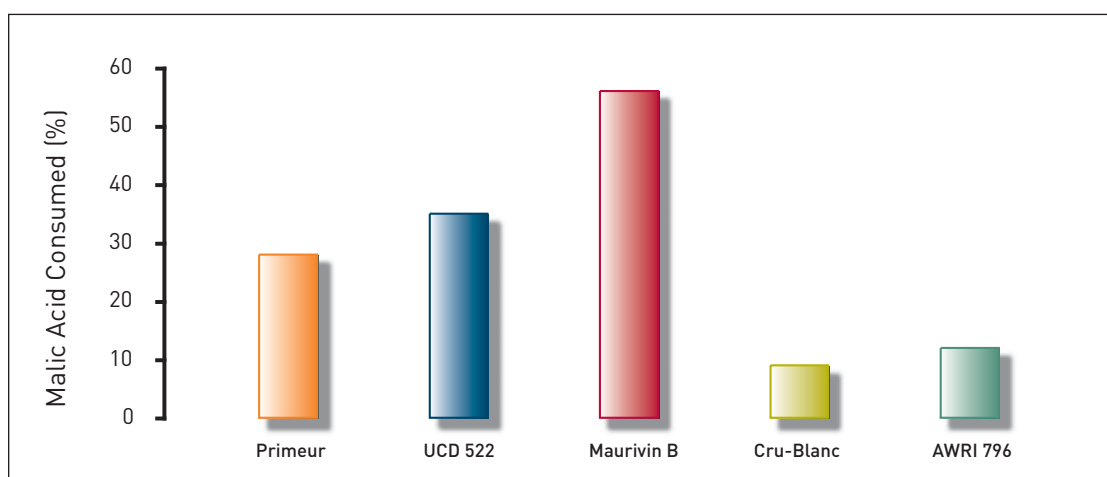
Trials undertaken at the Bordeaux Wine Institute showed Maurivin B to consume on average up to 56% of malic acid during fermentation. Maurivin B is a popular yeast for red winemaking, recognised for its ability to enhance colour and varietal fruit characters as well as producing a lower ethanol yield (see *Ethanol Yield Research Information* sheet). Maurivin strains UCD 522 and Primeur also show a high capacity to degrade malic acid, consuming 35% and 28%, respectively. Primeur, recognised for its fruity aromatics, is a popular yeast for the production of “young, fruity” varietal blends. UCD 522 is recognised for its complex aromatics, reminiscent of good ‘indigenous’ ferments.

Achieving a more balanced palate

Wines made from cool climate fruit can suffer from overtly high acid, resulting in a ‘sharp, bitey’ palate. Reducing this high acid level using Maurivin B, Primeur or UCD 522 can achieve a more balanced palate. Degrading malic acid during alcoholic fermentation can also reduce the time required to complete malolactic fermentation.

Yeast with a low capacity to consume malic acid

There is a growing need for yeast strains that consume only small amounts of malic acid during fermentation. The application of such yeast should be considered when fermenting juice/must with low acid levels. Maurivin yeast AWRI 796 and Cru-Blanc both exhibit a low capacity to consume malic acid. Cru-Blanc, with its yeast aromatics and ability to increase mouthfeel, is popular for the production of barrel fermented Chardonnay. AWRI 796 is widely used for both varietal red and white wines. The information presented here should be considered when there is a need to reduce or conserve a wine’s content of malic acid.



Experiments were conducted by Professor Aline Lonvaud of the Bordeaux Wine Institute. The trials were undertaken in commercial grape juice (red and white) with an initial sugar concentration of 200–210 g/L. Yeast inoculation rate was 20 g/L. Juice was sterile filtered to remove all microbial contaminants including lactic acid bacteria. Values were obtained in specific musts and should not be considered as absolute values. Consumption of malic acid may differ for different juice/must.