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### **MALO-LACTIC FERMENTATION**

Malo-lactic fermentation is true secondary fermentation. It involves the conversion of malic acid to lactic acid through the action of particular bacteria. Although CO<sub>2</sub> gas is released in the process, it is much slower than the sugar fermentation and does not produce obvious bubbling. It is generally desirable as a way to soften and mellow wines that have enough acid to benefit and can be applied to both red and white wines. Many of the great wines of Europe are believed to owe part of their fine character to this secondary fermentation.

Although it can occur spontaneously from fresh winegrapes, it is more reliable to introduce a pure bacterial culture which is packaged for that purpose. The Wyeast package of 125 ml. can be added directly to 5 gal., but making a starter will improve reliability and allow larger amounts of wine to be treated.

When the sugar fermentation is complete or almost complete, the SO<sub>2</sub> level (from sulfite use) will be less than 15 PPM. Low levels of SO<sub>2</sub> must be maintained for malo-lactic fermentation to take place. If adding the malo-lactic culture during racking and using sulfite wet equipment, rinse the sulfite solution from equipment with water before proceeding.

A good starter for 10 gal. of wine or more can be made as follows: Remove about 4 cups of the wine to be treated to a clean 1.5 liter or    gal. glass container. Add and dissolve 2 level measuring teaspoons (no more) of malic acid and then the 125 ml malo-lactic culture package. If SO<sub>2</sub> level is a little high, also add about 2 cups of water. Attach a fermentation lock. Allow two or three days at temperatures in the 70's for the starter to be ready. Malo-lactic fermentation is very gentle and not easily seen, but when the starter is active, swirling the container should produce some visible bubbles or slight foam. If unsure, wait an extra day.

To carry out malo-lactic fermentation in up to 50 gal. of wine, increase the starter as follows: when the one quart starter above is active, add it to two gal. of wine to which you have added 16 teaspoons of malic acid and allow another two or three days. A three gal. glass carboy is an ideal container for the larger starter.

After adding the starter to the wine, allow about two months at temperatures in the 60's for the malo-lactic fermentation to be complete. Some haze can usually be seen in the wine, indicating malo-lactic activity. When the wine clears again, the ferment is complete.

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