

Chemical De-acidification of Must and Wine



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www.carisetti.com

607-738-5844

dcarisetti@yahoo.com

Choices for Deacidification



- Carbonates (calcium and potassium)
- Ion-exchange
- Amelioration
- Blending

De-acidification of Must



- High acid/High pH must best de-acidified with calcium carbonate
- High acid/low pH must best de-acidified with potassium carbonates
- Blending with lower acid must
- Amelioration with sugar and/or water

Calcium Carbonate

- Best when used with high acid/high pH musts
- Works by combining with tartaric acid to form calcium tartrate.
- Advantages:
 - ✓ Material is inexpensive to purchase
 - ✓ Can reduce tartaric acid on average by 5.0 grams/liter (0.5%) without affecting wine quality
 - ✓ Maximum benefit obtained by treating 1/3 of total must and blending treated and untreated must portions

Calcium Carbonate

- Advantages (cont'd)
 - ✓ Must will continue to drop acidity, to a lesser extent, during fermentation
 - ✓ No problems with calcium tartrate precipitation in wine
 - ✓ Must is more forgiving than wine.
Fermentation kinetics favor must treatment over wine treatment.

Calcium Carbonate

As a rule of thumb, calcium carbonate is preferred for must de-acidification and not for wine de-acidification.

Use of 100% calcium carbonate to de-acidify wine runs a high risk of destabilization from calcium tartrate crystals which take months to develop. Exception is calcium tartrate seeding which is discussed later.

Potassium Carbonate/Bicarbonate

- Best when used with high acid/low pH musts.
- Works by combining with tartaric acid to form potassium bitartrate
- Chilling the must prior to addition will aid de-acidification
- Secondary de-acidification during wine stabilization is an added bonus.

Potassium Carbonate/Bicarbonate

- Potassium carbonate or bicarbonate is suited to raising wine pH after fermentation for these reasons:
 - ✓ A higher pH will balance an acidic wine
 - ✓ A higher pH will shift equilibrium to favor tartrate stabilization
 - ✓ A higher pH will encourage a malo-lactic fermentation to further deacidify the wine

Calcium Tartrate Seeding

- A 60/40 blend of calcium carbonate and tartaric acid. Mixed and washed three times to remove impurities.
- Added to clear racked wine at a rate of 16 grams/gallon
- Will render wine tartrate stable within 24-48 hours without chilling, reducing tartrate by 65-70%.
- On average, will reduce total acidity by 0.1 %
- Will not result in calcium tartrate instability

Ion-Exchange

- Upright cylindrical column (s) containing anion (OH form to remove tartrate) and/or cation (H form to remove potassium) resins.
- Reduces potassium and/or tartrate
- Separate columns for white and red wines due to color adsorption by the resins
- Eliminates need to cold stabilize
- Systems relegated to larger wineries

Amelioration

- Can be employed before, during, or after fermentation
- Best when used before fermentation to maintain sensory structure
- Legally bound on quantities of water and/or sugar that can be added
- Maximum benefit when blended with low acid must prior to fermentation to an acid level that still affords judicial use of amelioration credits

Blending



- Definition: combining varietal juices or wines so that the end product is better in one or more aspects than each individual component separately.
- Can blend to obtain:
 - ✓ lower acid
 - ✓ higher pH
 - ✓ more flavor
 - ✓ better color stability

Best Choices for Must Deacidification

1. Chill juice prior to fermentation and add potassium carbonate/bicarbonate to form potassium bitartrate.
2. Blend high acid and low acid juices and ameliorate if necessary.
3. Add calcium carbonate and ameliorate if necessary.

Best Choices for Wine Deacidification

1. Calcium tartrate seeding to tartrate stabilize and reduce acidity.
2. Adjust pH with potassium carbonate/bicarbonate to offset acid imbalance.
3. Blend high and low acid wines to create desired flavor preferences.