

DRIVING CHARDONNAY STYLE: INCREASING MINERALITY

VARIETY	TYPE OF WINE
Chardonnay	Premium Chardonnay
CHALLENGES (S)	OBJECTIVE
<ul style="list-style-type: none"> • Diacetyl • Over ripe fruit • Lacking acidity, freshness • Premature aging 	Utilize specific nutrients, yeast and shelf life improvement strategies to produce a high quality, mineral driven, <i>Chablis</i> style chardonnay.

BACKGROUND

Chablis is one of the most iconic wines in the world. It heralds from the cooler growing regions of Burgundy, France, and is known for being a firm aromatically powerful wine with aromas of flint, citrus, white flower, fruit and wet stones. Traditional white Burgundy is barrel fermented and aged on lees, developing a positive reductive bouquet with aging. These wines are dominated with the sensory descriptor of minerality. Although many would argue that minerality is a source of "terroir," research has shown that this sensory characteristic is derived from fermentation products such as succinic acid, ethyl esters and a complex of substances generated under conditions of amino nitrogen nutritional stress (proline catabolism).

There is supporting evidence that the transport of vineyard specific minerals from the roots and stems into grapes is irrelevant in the perception of minerality in finished wines (Baroň et al., 2012; Maltman et al., 2013). Reductive compounds such as methanethiol (MeSH) have been positively correlated and confirmed as a sensory and chemical drivers of wine minerality aroma (Rodrigues et al., 2017).

This protocol is designed increase the perception of minerality, balancing and managing the potential risk for sulfur off aromas is curical and constant monitoring of this protocol is advised.

Winemaking practices for increasing succinic acid:

- Higher solids
- Moderate SO₂ addition
- Fermentation temperature < 68°F (20°C)
- Target nitrogen supplementation to at least 300 mg/L YAN (limit amino nitrogen)
- Aeration during fermentation

The above is achieved to the best of our knowledge and experience.

The industrial application of the advice provided does not imply any responsibility on the part of our company.

PROTOCOL

WINEMAKING STAGE	OBJECTIVE	ENARTIS RECOMMENDATIONS	DOSAGE
GRAPE PROCESSING	Antimicrobial, Antioxidant	WINY: Pure high quality potassium metabisulfite (KMBS).	35 g/ton
SETTLING	Clarification	ENARTISZYM RS Pectolytic enzyme with cellulase and hemicellulase side activity, formulated for difficult to clarify white juice. *200-250 NTU	2 mL/hL
MUST	Yeast Nutrient Supplementation	NUTRIFERM SPECIAL Complex nutrient containing inorganic nitrogen (DAP), inactivated yeast and thiamine. 10 g/hL of NUTRIFERM SPECIAL supplies 16 mg/L of YAN and 0.10 mg/L of thiamine. *Adjust dosage depending on initial juice YAN to target 300 mg/L YAN	30-40 g/hL
ALCOHOLIC FERMENTATION	Yeast Rehydration and Inoculation	ENARTISFERM Q9 Fast fermenter with high nutrient requirements. Low VA, SO ₂ and H ₂ S production with β-lyase activity. Produces complex wines with mineral, roasted coffee, flint, and gunpowder notes. or ENARTISFERM TOP 15 Fast fermenter with low nutrient requirements. It expresses clean, varietal driven wines and can ferment at low temperatures. *FERMENT BELOW 63°F (17°C)	20 g/hL
	Mouthfeel Antioxidant Growth factors	ENARTISPRO BLANCO Yeast hulls with soluble mannoproteins and amino acids with strong antioxidant properties.	20 g/hL
<i>During the beginning stages of fermentation aerate the must to increase succinic acid production and yeast sterol concentration. Target 5 mg/L via racking with aeration (2 mg/L O₂) or pumping-over with an in-line venturi (2 to 2.5mg/L O₂).</i>			
1/3 THROUGH ALCOHOLIC FERMENTATION	Nutrient Supplementation	NUTRIFERM ADVANCE Complex additive containing DAP, inactivated yeast and cellulose.	20 g/hL
MALOLACTIC FERMENTATION	Balance Acidity Microbial Stabilization	ENARTISML SILVER <i>Oenococcus oeni</i> with fast and complete kinetics even under difficult conditions such as high alcohol and high polyphenol content. * Partial malolactic fermentation depending stylistic preference	Volume dependent
AFTER DESIRED MLF	Antioxidant, antimicrobial	WINY: Pure high quality potassium metabisulfite (KMBS)	0.5 ppm molecular SO ₂

For more information call our Technical Winemaking Specialist at (707) 838-6312

CITATIONS

Baroň, M., & Fiala, J. (2012). Chasing after minerality, relationship to yeasts nutritional stress and succinic acid production. *Czech Journal of Food Sciences*, 30(2), 188-193.

Maltman, A. (2013). Minerality in wine: a geological perspective. *Journal of wine research*, 24(3), 169-181.

Rodrigues, H., Sáenz-Navajas, M. P., Franco-Luesma, E., Valentin, D., Fernández-Zurbano, P., Ferreira, V., ... & Ballester, J. (2017). Sensory and chemical drivers of wine minerality aroma: An application to Chablis wines. *Food chemistry*, 230, 553-562.

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