An innovative approach to differentiated Cabernet Sauvignon wine styles using flash detente

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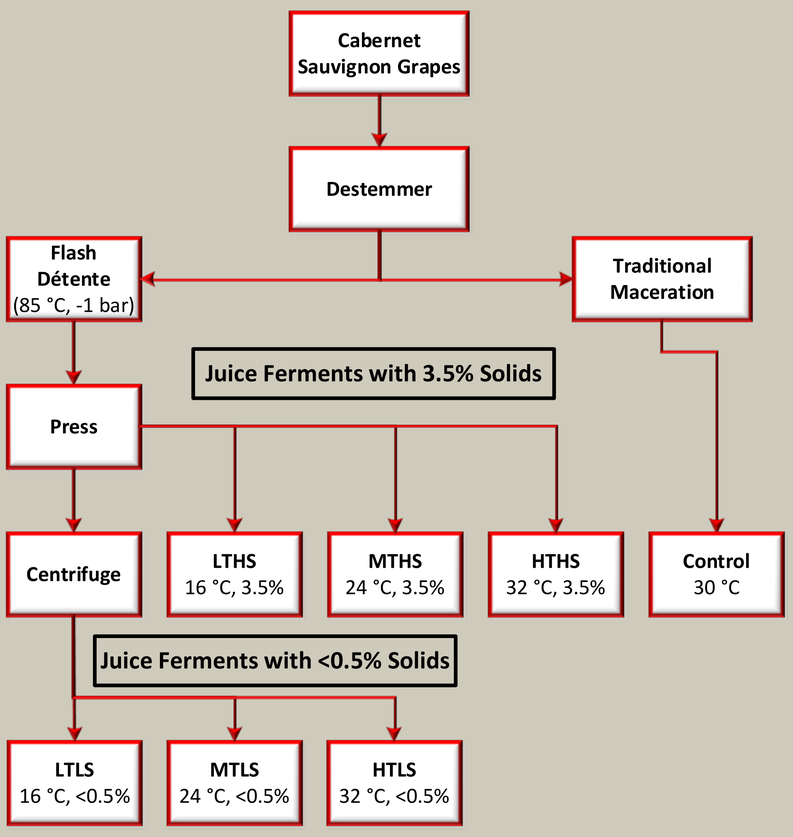
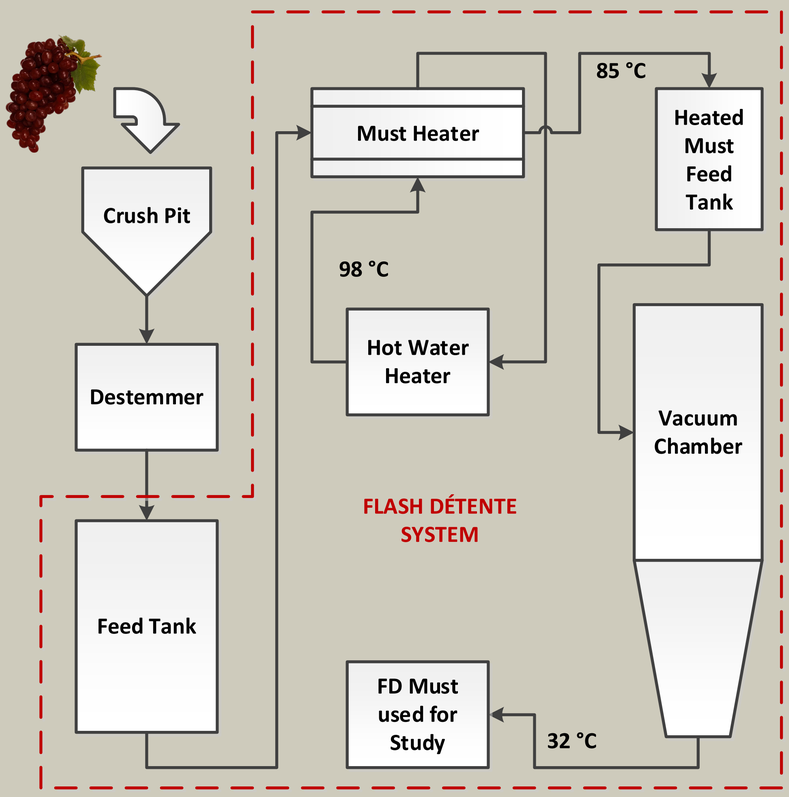
Introduction:

Winemakers employ various approaches to create differentiated red wine styles. This study investigated flash détente (FD) treatment of must, and subsequent fermentation of juice with or without grape solids at different fermentation temperatures, as an innovative approach to light bodied fruit-forward red wines.

Materials and Methods:



KEY: LT, MT, HT = Low, Medium & High Fermentation Temperature;
LS, HS = Low (<0.5%) & High (3.5%) Suspended Grape Solids



Flash Détente Process

Reference:

1. Ntuli R. G., Saltman Y., Ponangi R., Jeffery D. W., Bindon K., Wilkinson K. L., Impact of fermentation temperature and grape solids content on the chemical composition and sensory profiles of Cabernet Sauvignon wines made from flash detente treated must fermented off-skins, Food Chemistry, **2022**, 369, 130861, https://doi.org/10.1016/j.foodchem.2021.130861.

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Results and Discussion:

The impact of the treatments was assessed in terms of colour, phenolics, polysaccharides, volatile composition, and sensory profiles of the wines. Whereas low solids content and low fermentation temperature increased the concentration of esters in FD wines, the opposite conditions led to higher concentrations of fusel alcohols, polysaccharides and glycerol (Figure 1 & 2). Irrespective of solids content, grape-derived linalool concentration increased with higher fermentation temperatures.[1] In contrast to FD treatments, traditional fermentation conditions yielded wines with the highest concentration of fusel alcohols, 1-hexanol and polysaccharides, as well as the lowest concentration of anthocyanins (Figure 1 & 3).

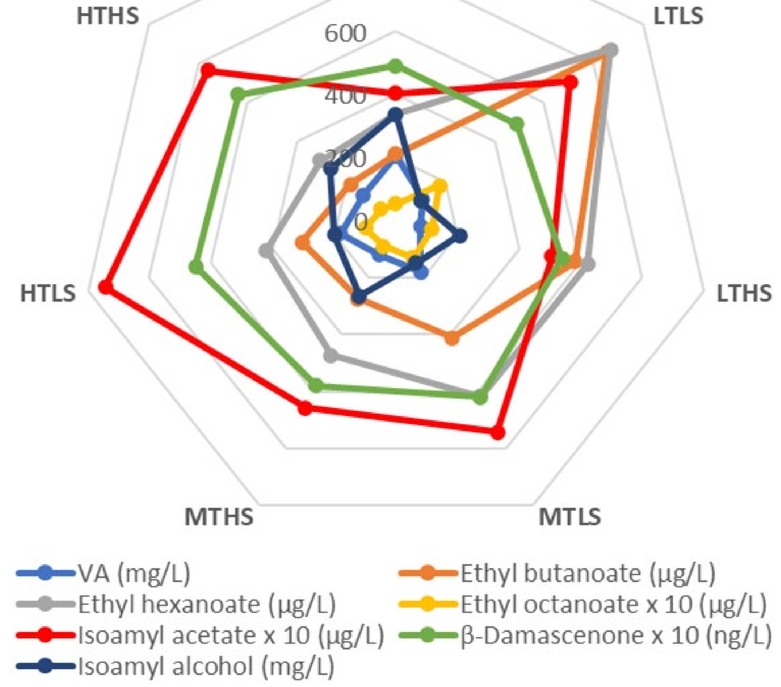

Figure 1. Volatile composition of wines from FD treated must fermented at 16, 24 and 32 °C, with or without grape solids, or from traditional maceration (Control).[1]

Removal of grape solids from FD juice prior to fermentation produced wines that were rated higher in red fruit and confectionery attributes, whereas dark fruit notes were more intense with the inclusion of 3.5% grape solids (Figure 3). On the other hand, significantly higher green and savoury attributes were found for control wines compared to wines from FD treatments. Regression analysis highlighted that the enhanced dark fruit attributes and decreased red fruit and confectionery characters with higher levels of grape solids could be attributable to changes in ethyl esters and higher alcohols, namely isoamyl alcohol, 2-phenyl ethanol, and total fusel alcohols.[1]

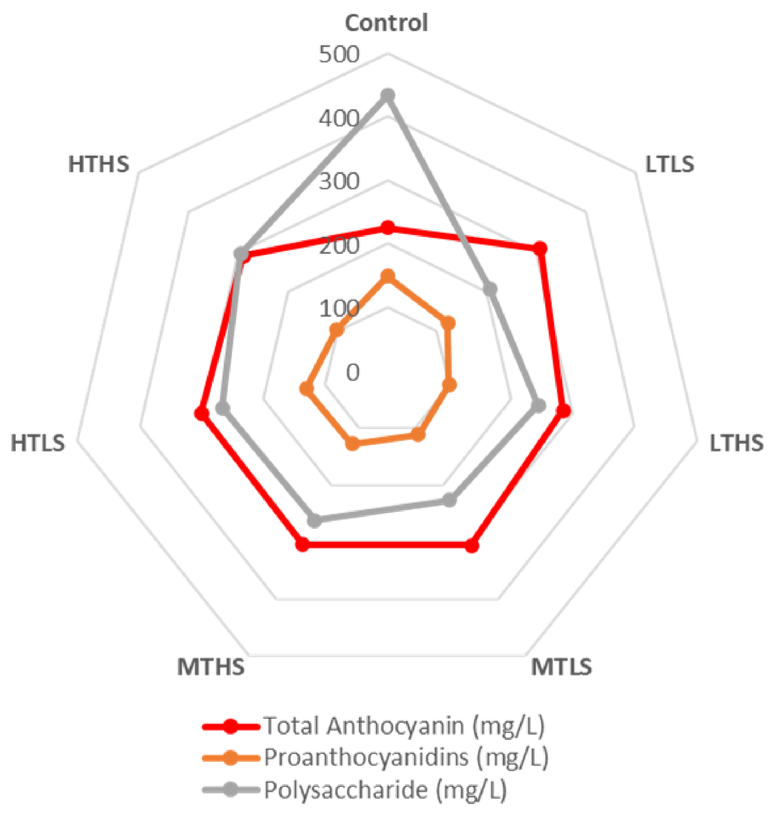

Figure 2. Phenolics and polysaccharide composition of wines from the different treatments.[1]

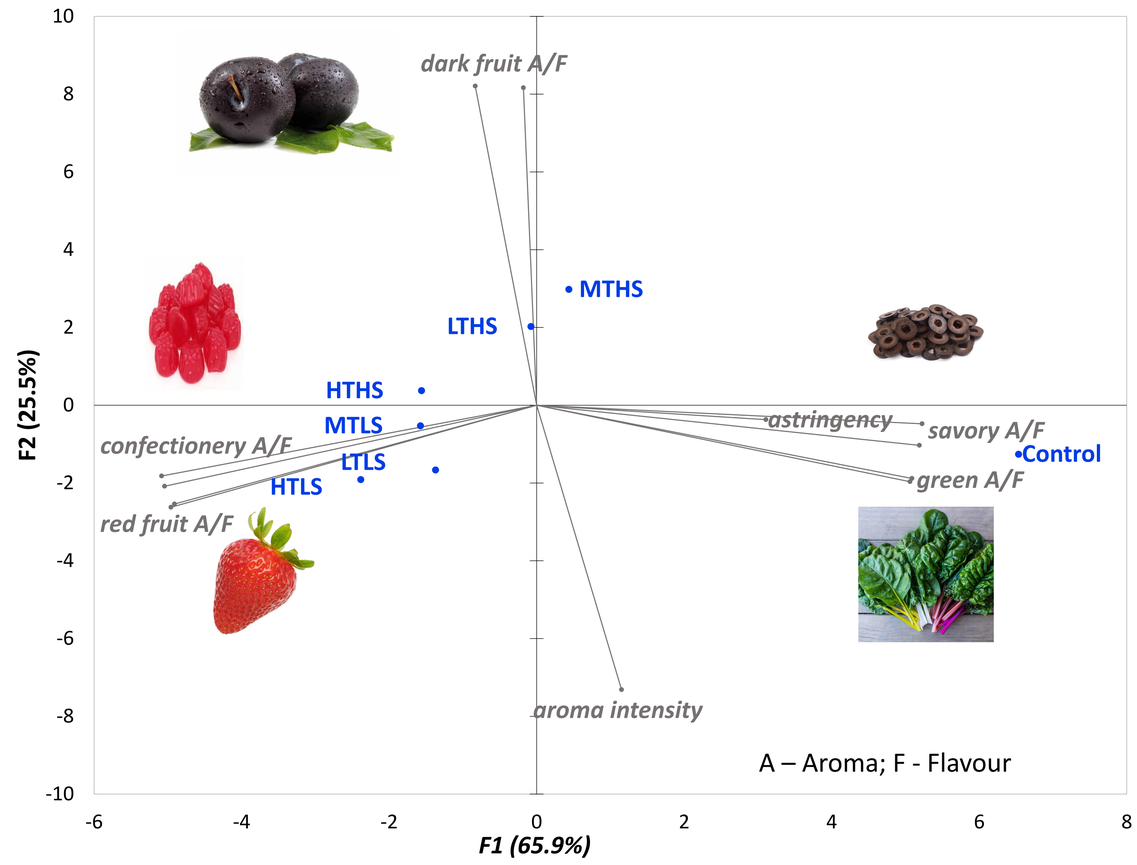

Figure 3. PCA biplot of sensory attributes for wines from the different treatments.[1]

Conclusion:

This study sheds light on how fermentation temperature and fine grape solids content can be manipulated to influence the chemical composition and sensory profiles of red wines made by fermenting juice derived from flash détente treated must. The overall findings revealed that FD can be used to create differentiated light bodied, fruity and refreshing styles of red wine.