



## Juice turbidity and mouthfeel-promoting compounds



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[Basic Wine](#)

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The quantity and quality of **juice solids** at the onset of fermentation affect fermentation kinetics and the sensory profile of the resulting wines (see previous [blog post](#)). Maintaining a **higher solids content** in the juice at the onset of fermentation is often used as a tool in an **effort to enhance the body and texture** of white wines. In a study conducted by The Australian Wine Research Institute<sup>1</sup>, the effect of a juice's turbidity on the resulting wines' polysaccharide, glycerol and phenolic content was investigated to ascertain that these **mouthfeel-promoting compounds** do indeed increase with increased juice turbidity.

## Materials and Methods

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The juice of a white varietal was used to test the effect of **different levels of juice turbidity** at the onset of fermentation on certain wine parameters which have been associated with the mouthfeel of wines.

The juice was gravity-settled to four degrees of turbidity:

- Full solids (no settling)
- 500 ntu
- 100 ntu
- <40 ntu (obtained by centrifugation)

All juices were fermented using *Saccharomyces cerevisiae* strain EC1118 at 18°C and the treatments were done in triplicate.

## Results

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### *Polysaccharides*

- The juice with the **highest solid content** (full solids) delivered the wine with the **highest polysaccharide** content (approximately 160 mg/L).
- The juice that was settled to 500 ntu resulted in a wine with a polysaccharide concentration of approximately 140 mg/L.
- The polysaccharide concentration in the wine made from juice that was settled to 100 ntu and <40 ntu was similar with both treatments resulting in a polysaccharide concentration of approximately 125 mg/L.

**A greater perceived “oiliness” in wines fermented from high solids juice could be attributed to increased polysaccharides<sup>1</sup>.** Studies performed at the AWRI<sup>1</sup> indicate that differences in polysaccharides at wine concentrations have a positive **influence on white wine viscosity**. Others have also demonstrated a link between polysaccharide concentration and **white wine “fullness”<sup>2</sup>**. Therefore, **a link between greater oiliness in wines fermented from high solids juice and their polysaccharide content is a possibility.**

## *Total phenolics*

- The total phenolic concentration in the wines fermented from full solids juice was **not different** from the total phenolic level in the wines fermented from the <40 ntu juice.

Earlier studies in which high and low solids juices were simultaneously taken from the bottom and the top of settling tanks and fermented, reached the same conclusion: **higher solids ferments did not result in higher wine phenolics**<sup>3,4</sup>. Even though the phenolic content did not differ between high and low solids juices in the study mentioned, the sensory evaluation revealed that wines fermented from high solids juice were perceived to be more astringent (equivalent to fermenting for two days on skins) and slightly more bitter. It could be that the solids content modified the wine phenolic profile (composition), without altering the total phenolic concentration<sup>1</sup>. Results from the present study would also suggest that the **total phenolic content does not change linearly** related to juice solid content which suggests a **complex mechanism of gains and losses**<sup>1</sup>.

## *Glycerol*

- Fermenting on **full solids** resulted in a **higher glycerol** concentration (around 7.8 g/L).
- The glycerol concentration in the wines fermented from either 500 ntu, 100 ntu and <40 ntu juices were all around 5-6 g/L glycerol.

It is widely believed that mouthfeel and texture properties are strongly dependent on the glycerol concentration in the wine and that higher glycerol levels, therefore, improve wine quality. However, many of these reports are based on anecdotal and empirical evidence. It was estimated that the **perceived viscosity** of white wine with a **glycerol concentration at the high-end range** (12.5 g/L) would **only be 1% higher** than the perceived viscosity of an equivalent wine that **is low in glycerol** (5 g/L)<sup>5</sup>. If this is the case, differences in oral viscosity would be hard to perceive in the 5 to 10 g/L range typical of dry white wines. A previous [blog post](#) delved into various aspects of glycerol in wine.

While higher glycerol levels from higher juice solids are expected due to the greater nutritional status of the must, the results suggest that high a high amount of solids in the juice can result in increased glycerol levels in wine. Although the increase in glycerol can **potentially increase the perceived sweetness** of the wine, it is **unlikely that an increase in viscosity will be perceived** at these

concentrations<sup>5</sup>. However, it should be kept in mind that the production of glycerol by the yeast depends on many factors including the yeast strain and fermentation temperature.

## Conclusion

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This study shows that the **level of juice clarity** at the onset of fermentation can **affect the concentration of compounds that have been linked to the mouthfeel** of white wines. It is unclear to what extent these differences will affect the sensory perception of different wines and the topic needs further investigation.

## References

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