

ARC Training Centre for Innovative Wine Production

Technical note

Changes in Wine Ethanol Content due to Evaporation from Wine Glasses

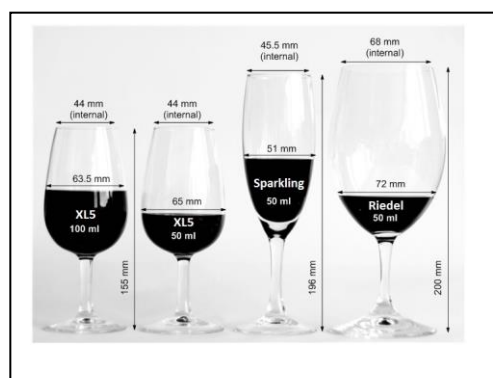
Introduction


It may seem obvious, but the evaporation of volatile wine components, particularly ethanol, from wine glasses exposed to air can have a significant impact on the sensory evaluation of wine. A recent study was motivated by the presumption that even small changes in the relative proportion of water and ethanol present in wine can significantly influence the perception of that wine's sensory attributes [1,2]. We investigated the effect of evaporation by monitoring the changes in ethanol content of commercial wines in different glasses exposed to ambient conditions, over time.

The key outcomes

The ethanol concentration of wine in uncovered glasses was found to decrease significantly over time as a consequence of evaporation; with the rate of ethanol loss being strongly influenced by exposure to airflow, together with glass shape, headspace and wine volume.

There was no change in wine ethanol content where glasses were covered with plastic lids, but significant reductions in wine ethanol content were observed when glasses were not covered. Losses resulted in the alcohol by volume (abv) decreasing by between 0.9 and 1.9% for wines exposed to ambient airflow for 2 hours. The rate of ethanol loss was strongly influenced by more direct exposure to airflow from the laboratory





air-conditioning unit, together with certain glass shape and wine parameters; glass headspace to wine volume in particular. These findings have important implications for the technical evaluation of wine sensory

properties; in particular, informal sensory trials and wine show judging, where the use of covers on wine glasses is not standard practice.

Our study showed that evaporation can also result in the loss of wine volatile compounds and can have a marked impact on wine aroma. In some instances, there is the potential for significant sample variation as a consequence of evaporation. It is possible therefore that the consistency of wine evaluation results could be significantly affected by such changes.

Recommendations

Not surprisingly, the larger Riedel style wine glass had the greatest headspace to wine volume ratio, so it is worth considering whether its increasing use in wine shows may exacerbate the effects of ethanol evaporation, particularly under conditions similar to those used in the current study.

While this effect is unlikely to be of much concern to general consumers, professionals involved in formal wine sensory evaluation, should be aware of these phenomena. They should take care to cover the glasses prior to evaluation. If not possible, they should minimise the interval between pouring samples and tasting; use smaller XL5 glasses with greater volume of sample; and avoid draughty locations.

Acknowledgements

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References

1. Wollan, D.; Pham, D-T; Wilkinson, K. (2016) Changes in Wine Ethanol Content Due to Evaporation from Wine Glasses and Implications for Sensory Analysis. *Journal of Agriculture and Food Chemistry*, 64 (40), pp 7569–7575.
2. Wollan, D.; Pham, D.-T.; Wilkinson, K. L., Changes in wine ethanol content due to evaporation from wine glasses. *Wine & Viticulture Journal* 2016, 31, 32-35.

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