

Understanding wine quality: linking wine composition, sensory properties and consumer quality perceptions

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With the current difficulties the wine industry faces, it is more important than ever to ensure that we continue to make wines that consumers appreciate. Through research, we have a good ability to measure components in grape berries that are important to flavour in wine, and we also can quantify the combinations of wine volatile compounds that have been shown to shape wine style, intensity and varietal flavour. However, knowledge of the concentration of key flavour compounds found in wines or grapes is only the starting point for a targeted optimisation of viticultural or winemaking practices. In addition, we need to understand the quality implications of increasing or decreasing different flavours in wines.

Quantifying sensory profiles of wines and relating these profiles to consumer likes and dislikes is the established way to truly know how chemical components relate to quality for different groups of consumers. To answer research questions regarding levels of chemical components that are optimal for consumer preference, we have three main options. We can analyse a large set of commercial wines of differing flavour profiles and relate the chemical constituents to flavour properties and consumer acceptance. This type of study is arguably the most realistic but relies on complex correlations among components and sensory properties. A second approach is to make additions of flavour compounds to a base wine. This has the advantage of being a more direct method, but suffers from the disadvantage of the results being dependent on the base wine used and that any addition can unbalance a wine. The final possibility is to perform controlled winemaking experiments so that the effect of a treatment on composition, sensory properties and consumer liking can be evaluated. However, the wines produced through experimental winemaking may not always be very different in their sensory properties, or may not be very palatable as optimal adjustments that would be practised in commercial winemaking are not always possible. There have been several recent studies conducted at the AWRI using each of the approaches outlined above, each giving insight into the intricate relationships of chemical measures and consumer preferences (1,2). As most consumers drink and evaluate wine in an informed condition, being aware of price and label information, questions remain how much wine composition and flavour influence consumers' wine liking, choice and repurchase intent in the presence of marketing attributes (3,4).

Finally, consumer preference studies are providing direction to wine producers regarding the influence of different sensory attributes to segments of consumers. From these studies, decisions can be made regarding optimising wines to particular groups of a population. Interestingly, factors such as the years of wine drinking experience, or the frequency of consuming different wine types, have been found to be moderate differentiators among preference groups. Building on this observation, a key question is whether relatively short-term changes in preference occur with simple repeated exposure to a product; ie are some consumers likely to lose or gain interest for some wine types over time; and what influences such change (5).

- (1) Lattey et al. (2010) Consumer acceptability, sensory properties and expert quality judgements of Australian Cabernet Sauvignon and Shiraz wines. *Australian Journal of Grape and Wine Research* 16, 189–202.
- (2) Francis et al. (2010) Linking wine flavour components, sensory properties and consumer quality perceptions. Proceedings of the 14th Australian Wine Industry Technical Conference, 48-52.
- (3) Mueller et al. (2010) Filling the gap – how do sensory and marketing attributes interact in consumer choice? Proceedings of the 14th Australian Wine Industry Technical Conference, 53-59.
- (4) Mueller et al. (2010) Combining discrete choice and informed sensory testing in a two-stage process: Can it predict wine market share? *Food Quality and Preference* 21, 741–754.
- (5) Osidazc et al. (2010) The effect of repeated wine exposure on consumer preferences. Proceedings of the 14th Australian Wine Industry Technical Conference, 221-223.