

A Sensory Evaluation of Canadian and American Merlots

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Introduction

To investigate the elements of a developing taste culture unique to the region's artisanal wines, we organized two sensory evaluations of nine Okanagan Valley (Canada) and one Columbia Valley (US) Merlot wines. The commercial wines were chosen based on their availability locally and reflected multiple vintages. They came from distinct grape-growing areas within the Okanagan valley and the Columbia valley, each region representing a "terroir." The 10 wines were assessed by six local wine professionals with recognized credentials in the industry.

Wine #	Vintage	Region	Alc%	Price
1	2013	Okanagan Valley - Golden Mile	13.8	\$18.95
2	2013	Okanagan Valley - Naramata Bench	14	\$19
3	2013	Okanagan Valley - Oliver	14	\$17.50
4	2011	Okanagan Valley - Skaha Lake	14.2	\$35
5	2014	Okanagan Valley - Golden Mile	13.9	\$14
6	2012	Okanagan Valley - Center	14.2	\$17.39
7	2012	Columbia Valley, USA	13.5	US\$17
8	2012	Okanagan Valley - Naramata Bench	14.5	\$20
9	2013	Okanagan Valley - Golden Mile	14	\$17.49
10	2013	Okanagan Valley - Oliver + Osoyoos	14	\$15.99

Methods

The six panelists evaluated each wine for seven aroma descriptors and eight taste and flavor descriptors, following a descriptive analysis methodology adapted from Guinard (2006). We used a pre-defined list of red wine sensory attributes that were well understood by all tasters.

The panel also assessed the overall quality of the 10 wines using a quality assessment grid based on a twenty-point scoring sheet adapted from the University of California at Davis in 1959 (Noble 1995).

The wines were assessed twice by the same panel. Tastings took place on two different days approximately two weeks apart for three of the panelists; the other three panelists, due to time restrictions, did both tastings on the same day.

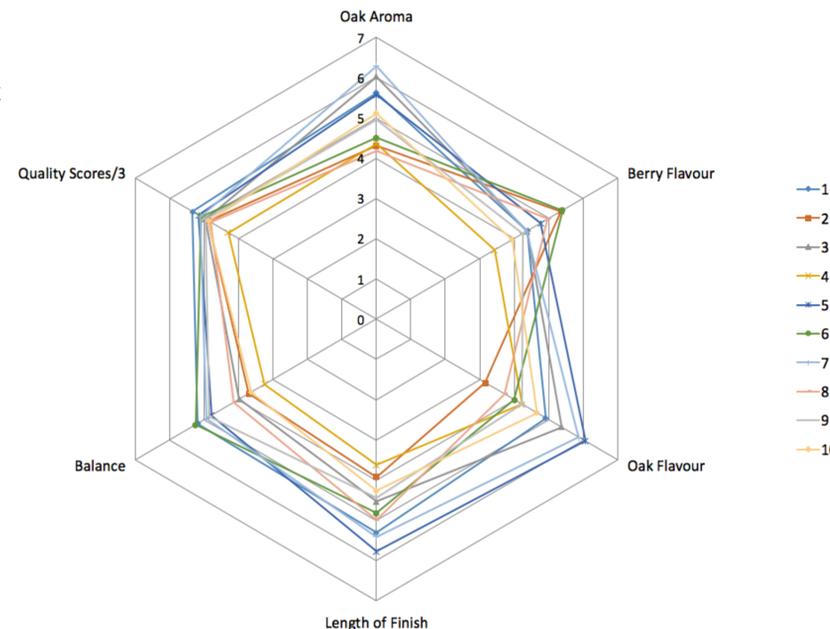


Results

The Analysis of Variance revealed that the 10 wines were significantly different for the 5 following attributes ($p < 0.029$): "oak aroma", "oak flavor", "berry flavor", "balance", "length of finish". Since the "quality score" descriptor showed a significant Wine X Judge interaction, the F-value was re-calculated using a technique used by Cliff et al. (2012). Calculations resulted in a significant attribute ($p = 0.081$).

The judges were discriminant and able to notice differences amongst the wines in terms of woody sensory character ("oak aroma" and "oak flavor"; Noble et al. 1984, 1987) as opposed to vegetal ones (e.g. "vegetative", "vegetal", "green bell pepper") attributes which were not significantly different. Similarly, the wine descriptors "mouthfeel", "astringency" and "acidity" were not significantly different ($P < 0.05$).

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For the 6 significant attributes, a Cobweb diagram shows sensory differences amongst the 10 Merlots (see figure above). Sensory scores represent the intensity of the sensory perception which is measured using an attribute scale ranging from 0 to 10 with 0 representing "no intensity" and 10 representing "high intensity."

The post-hoc LSD test (see table below) was then used to identify differences between sample means. Score means that share the same subscript letters are not significantly different ($p < 0.05$, $p = 0.081$ for "quality scores"). Samples are colour-coded for each significant attribute.

Wines 6, 7, 1, 5 were perceived as most intense for most significant attributes. By contrast, wines 4 and 2 were weakest in intensity for all attributes.

Ranking Assessment	1	2	3	4	5	6	7	8	9	10	LSD (P<0.05)
Oak aroma	8	2	4	6	9	10	5	1	3	7	1.25
Berry flavour	4	10	9	7	3	1	5	8	2	6	1.14
Oak Flavour	2	8	6	4	9	10	1	3	7	5	1.26
balance	4	10	2	3	8	5	9	7	1	6	1.19
Length of finish	4	2	10	9	3	6	8	1	7	5	1.14
Quality	4	8	2	10	9	3	6	7	5	1	1.57 - p = 0.081

Conclusions

Our findings indicate that, according to our panel of BC wine professionals, the varietal merlots were differentiated based on the intensity and integration of their fruit and oak character which determined their perceived quality.

While some panelists reported slight wine defects (brettanomyces and volatile acidity taint), it would have been useful to add a defect/off-flavor scale to the list of attributes and capture this information on the PCA plot to further characterise the wines.

The evaluations were conducted blind using precise sensory descriptors and the sensory data analysed statistically. Wine professionals rated the wines in such a way that brand-varietal preferences did not impact the sensory judgment. This opens the possibility of a more objective and robust sensorial evaluation of the attributes of each wine tasted by minimizing non-sensorial inputs. This is critical since wine flavor is an important proxy for wine quality with wine aroma a determinant factor of lesser quality (UC Davis research team on wine quality Hopper, Nelson, Ebeler & Heymann 2012).

In the context of a global and/or competitive local wine industry, in-house or outsourced sensory profiling services may help with characterizing wine from designated origins and identifying consumer preferences.

References available upon request