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Trained Panel Evaluation of Pinot Noir Fermented With Different Strains of Malolactic Bacteria

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In 1981, a trial was established to evaluate the performance of several strains of malolactic bacteria. Pinot noir wines were inoculated with several strains of malolactic bacteria, and their performance was reported by Watson (above). One strain, ML-34, can be thought of as the industry standard, while ER-1A and EY-2D were two new Oregon strains. MLT, a strain which is not at this time commercially available and PSU-1, a strain from Pennsylvania State University, were also tested. A final sample of wine was not inoculated but underwent malolactic fermentation on its own.

In the fall of 1985, a panel of twelve volunteers underwent training in the Sensory Science Laboratory at Oregon State University in order to learn how to describe in sensory terms, Pinot noir aroma. Their first challenge as a panel was to study the wines fermented by the several strains of malolactic bacteria mentioned above. Oregon winemakers had previously evaluated the same wines and had noted few if any differences.

The panel used reference standards to aid in terminology development. For example, for fruitiness, many examples of fruit types (citrus, berry, tree fruit) would be available as well as fruit forms (Cams, purees, juices). After working with the wines and reference standards for several sessions, the panel selected the descriptors listed in Table 1. They also were allowed to note more specific descriptors if they felt they were appropriate. For example, if a panelist felt the fruitiness of a sample was definitely raspberry-like, that attribute was also rated. Preliminary analysis of the primary descriptors has been completed and mean scores and statistical significance levels are presented in Table 1. Of the eight major attribute categories, five showed significant differences among the treatments. Only "earthy," "spicy" and "microbiological" did not show differences.

TABLE 1. Mean Scores^a for intensity of Pinot noir sensory attributes for different malolactic bacteria, as judged by a trained sensory panel.

Malolactic Bacteria	DESCRIPTORS							
	Overall Intensity	Caramel	Fruity	Earthy	Spicy	Chemical	Micro-biological	Vegetative
Natural (no culture added)	4.85	1.60	4.37	1.40	2.73	5.05	2.55	1.92
MLT	4.89	2.45	4.77	1.43	2.28	4.55	2.37	2.23
ER-1A	5.62	2.79	4.90	1.27	2.62	4.43	2.45	1.13
ML-34	5.06	2.05	4.29	1.43	2.48	4.30	2.50	1.79
EY-2D	5.00	2.07	3.97	1.86	3.01	4.63	2.93	2.04
PSU	4.58	2.48	4.36	1.29	2.47	4.90	2.87	2.02
Statistical Significances Level	p<.05	p<.05	p<.05	NS	NS	p<.05	NS	p<.05

^aScale ranged from 1 = not present to 9 = extreme.

The attribute intensity scores for ML-34, the industry standard, fell pretty much in the middle of the range for all attributes. However, ER-1A, one of the new Oregon strains, scored highest in overall intensity, caramel (honey, buttery, butterscotch) and fruitiness. It was rated very low in earthy and vegetative character. The other Oregon sample, EY-2D, was more similar to the ML-34. It did receive the highest mean score for intensity of spicy (black pepper and clove) and microbiological (lactic) character, however there were no statistically significant differences shown for either characteristic.

The wine which underwent malolactic fermentation on its own (no specific culture added) was scored highest in "chemical" character. More specific terms used to describe this wine were pungent, sulfur, and ethanol.

The next step in this research is to obtain opinions from the winemakers on the "quality" of the wine produced, as the panel only provides descriptive information. When these data have been gathered and analyzed, a more detailed report on the results of this study will be reported in a technical journal and to the industry. The panel will also evaluate Chardonnay and Pinot blanc which were fermented by the same organisms.

The work reported here is just an example of the approach the trained wine panel is using to determine what differences experimental conditions can create. It will be applied to many different types of studies undertaken cooperatively with OSU's Departments of Horticulture, Food Science and Technology, and the Oregon wine industry.