2025 Redwood Road, Suite 9 • Napa, CA 94558 • Phone 707-259-0740 • Fax 707-259-0760

Sauvignon blanc wines (all bottled with screw-caps):
A = 2006 Carneros Napa Valley
B = 2006 Russian River Valley
C = 2006 New Zealand Marlborough
D = 2005 Napa Valley

Consumer evaluation:
Participants at Vinquiry's Aromatic Whites seminar on May 22, 2007 rated how much they liked four Sauvignon blanc wines using a 9-point hedonic scale. There were 135 responses. Since the number of consumers is significant, it was determined to group them into homogeneous groups in order to make the PREFMAP results easier to interpret. The agglomerative hierarchical clustering method was chosen and 10 clusters were specified.

Expert sensory evaluation:
Five expert judges evaluated the intensity of twenty-two attributes for each of the four wines using 10-point scales. The sensory attributes were pre-selected and included: yellow color intensity, overall aroma intensity, sulfide aroma, VA, floral aroma, fruity aroma, herbaceous/vege aroma, spicy aroma, honey aroma, butter aroma, vanilla aroma, oak aroma, overall flavor intensity, sweetness, acidity, bitterness, fruity flavor, vegetative flavor, mouthfeel/body, duration of flavors, trueness to type and overall quality.

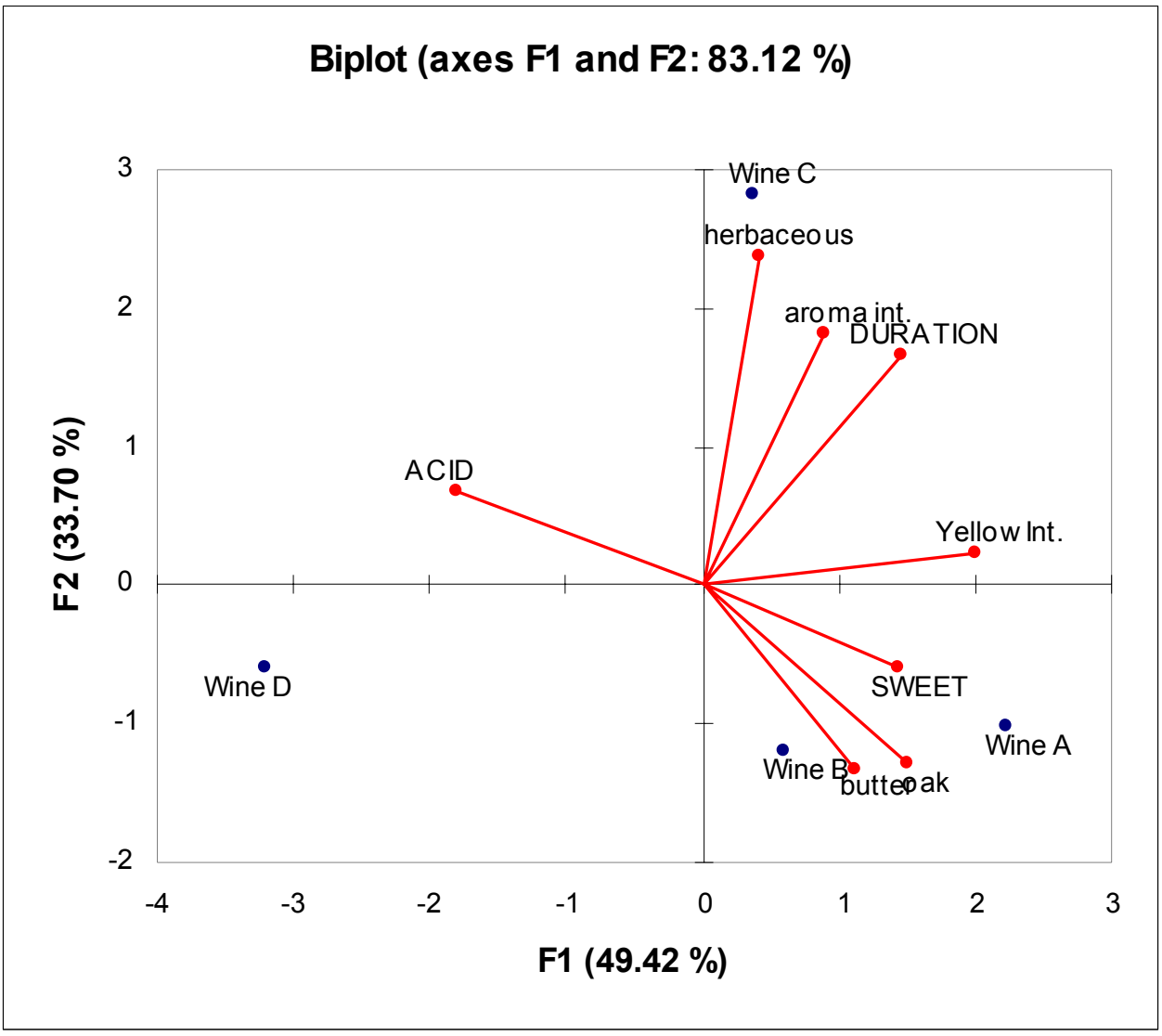
Sixty mLs of each wine were served at room temperature to the judges in tulip-shaped wine glasses. These were covered and coded with the respective three digit random numbers. Distilled water was provided for rinsing. Judges evaluated the four wines in one session and were not allowed to communicate during the evaluation. A non-randomized complete block design was used to evaluate the wines. No replications were performed. Data entry and analysis were conducted using FIZZ and XLSTAT.

An advanced statistical method, principal component analysis (PCA), is often used to illustrate relationships between a reduced set of variables. Patterns in descriptive sensory data may be determined by analyzing the data by this multivariate statistical method. The number of variables is reduced using factor analysis such that the first principal component (PC) statistically identified explains most of the variability in the data. The second PC, which is not correlated with the first, explains the majority of the remaining variance. Additional PCs may be identified. The principal component plots show the position of each wine as a single point. This single point represents the scores for each of the different sensory attributes. Points that are close together are wines that are sensorily similar and points that are far apart are wines which are different. Emanating from the central origin are vectors representing each attribute. The length of the vector may be interpreted as an indication of influence on that PC. Short vectors indicate attributes of relatively low importance. Close alignment of a vector with the PC axis indicates a high correlation between the attribute represented by the axis and the variability explained by the PC.

Principal component analysis of the four Sauvignon wines revealed that two of the principal components were significant in describing the variance (eigenvalues >1). In Figure 1, the four wines and eight sensory attributes are plotted on the first two PCs. These first two PCs explain 83.1% of the variance. Wines separated along the first PC according to yellow intensity and acidity. Oak aroma, butter aroma and sweetness also contributed to the separation of the wines along the first PC. The position of the wines on the second PC is determined by the intensity of herbaceous aroma, overall aroma intensity and duration of flavor. Sweetness and acidity are inversely correlated.

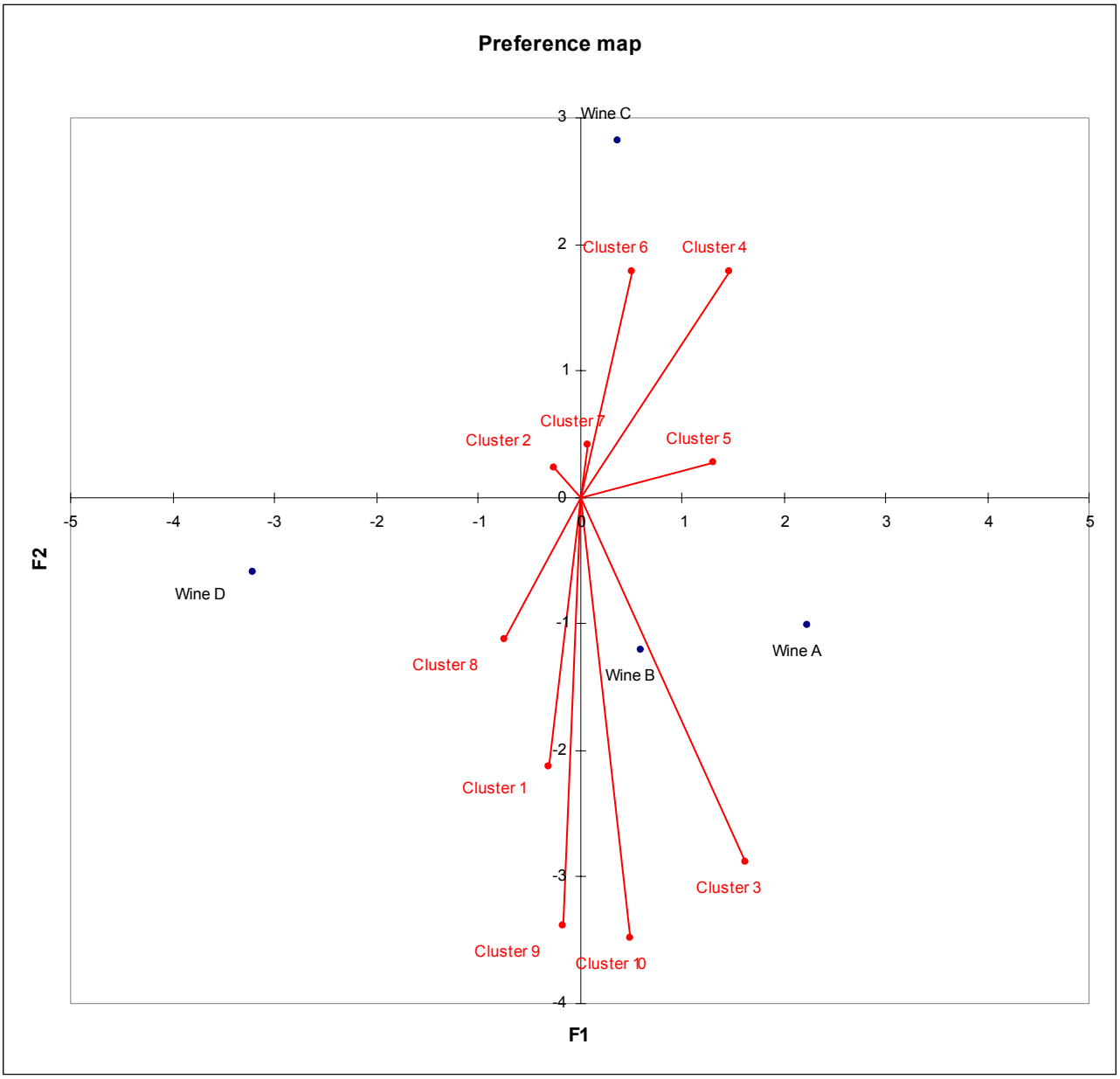
Wine A was characterized by yellow intensity and sweetness; it also had butter and oak aromas and was low in acidity. Wine B had butter and oak aromas and was low in herbaceous aroma and acidity. Wine C was very herbaceous and high in overall aroma intensity and displayed a long finish. Wine D was characterized by the intensity of acidity. It also had the lowest intensity of yellow color.

Figure 1. Principal component analysis of the mean ratings of the 4 Sauvignon blanc wines for 8 sensory attributes. Aroma attributes are in lower case and flavor attributes are in upper case.



External Preference Map:
The PREFMAP method in XLSTAT was applied, using the coordinates of the wines in the 2-D factor space for the DA data and the ratings given by the consumers summarized by the standardized ratings for the 10 clusters.

Figure 2: External preference map for the 4 Sauvignon blanc wines and 10 clusters of consumers.



Wine B, characterized by low herbaceous aroma, was most preferred by clusters 1 and 9. Consequently, these two consumer clusters least preferred Wine C which was characterized by high herbaceous aroma. Wine A, characterized by sweetness, yellow color and butter and oak aromas, was most preferred by Cluster 3, 5 and 10. Two of these clusters, 3 and 10, least preferred Wine C while cluster 5 liked it second best. Consumer clusters 2 and 8 most preferred Wine D, which was characterized by high acidity and low yellow color. Cluster 1 liked Wine D second best. Consumer clusters 4, 6 and 7 most preferred Wine C and least preferred Wine D.