

**Title** Determinants of flavor acceptability during the maturation of navel oranges  
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### **Abstract**

Navel oranges of differing maturities were harvested at regular intervals for three successive seasons and evaluated for external color, percent juice, soluble solids concentration (SSC) and titratable acidity (TA). Fruit from harvest dates throughout the season were rated by a sensory panel (12–20 panelists) for flavor likeability (hedonic score), sweetness, tartness and richness (strength of citrus flavor). Gas chromatography/olfactometry was used to identify odor-active volatiles present at each harvest date in the final season. Peel color and BrimA, a parameter calculated by subtracting TA times a constant from SSC, were the most closely related quality parameters to the hedonic score and ratings of sweetness, richness and tartness. A predictive equation for hedonic score was developed using stepwise regression that combined peel color, percent juice and BrimA and accounted for 63% of the variation in the data. Year, location and navel strain had only minor effects on the relationship between the quality parameters and the sensory ratings. Nineteen odor-active compounds were identified, of which six were significantly correlated with changes that occurred in the sensory attributes during navel orange maturation. The SSC/TA ratio, the basis for the current minimum maturity standard in California, was not as closely related to likeability as BrimA. At the minimum maturity standard (SSC/TA) of 8:1, the hedonic score calculated from the overall regression equation was 4.4, a value well into the “dislike” range, indicating that the current standard is likely set at too low of a value to satisfy most consumers.