

**Title** Identification of volatile quality markers of ready-to-use lettuce and cabbage  
**Author** Julien Lonchamp, Catherine Barry-Ryan and Michael Devereux  
**Citation** Food Research International, Volume 42, Issue 8, October 2009, Pages 1077-1086  
**Keywords** Volatile compounds; Detection; Marker; Sensory quality; Monitoring; Ready-to-use vegetables

### **Abstract**

Volatile emission changes of ready-to-use vegetables directly result from minimal processing and can reflect the sensory changes occurring in the product. Based on the detection of key volatile compounds, novel on-line and consumer quality-monitoring methods can be developed. The aim of this study was to identify volatile biomarkers for a range of leafy green ready-to-use vegetables (Butterhead and Iceberg lettuce and Irish York cabbage). Headspace volatile compounds were monitored using gas chromatography/mass spectrometry (GC/MS). The sensory quality of the products was evaluated at days 1, 7 and 14 using sensory and analytical measurements. Changes of volatile concentrations and sensory attributes were statistically correlated. The main quality markers identified for active modified atmosphere packaged (MAP) Butterhead lettuce were: 2-ethyl-1-hexanol, cis-3-dodecene, 4-ethylbenzaldehyde, acetocinnamone,  $\beta$ -elemene, 1-chlorododecane, dimethylethylphenol, ester pentanoic acid and thio-amino-butanamide. The main indicators of freshness were dimethylethylphenol and ester pentanoic acid, while the main quality loss markers were cis-3-dodecene and  $\beta$ -elemene.