

**Title** Headspace fingerprint mass spectrometry to characterize strawberry aroma at super-atmospheric oxygen conditions

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### **Abstract**

This paper reports on the relation between super-atmospheric oxygen packaging and aroma production in strawberries. Volatile compounds were extracted from the headspace of strawberries stored at 7 °C for 0, 4 and 7 days under different gas conditions. Super-atmospheric oxygen concentrations were applied in combination with or without elevated CO<sub>2</sub> concentrations and the volatile production was measured with GC-MS. The potential of headspace fingerprint mass spectrometry (HFMS), a rapid technique for aroma profiling, was evaluated. Canonical discriminant analysis (CDA) based on the 16 most abundant volatile compounds and 26 HFMS signals (*m/z*) was applied to discriminate the samples according to gas storage treatment. The results showed that after 4 and 7 days of storage under super-atmospheric oxygen concentrations (without carbon dioxide) the production of ethyl acetate was suppressed. Ethyl acetate is one of the most important off-flavors in strawberries. Samples treated with only oxygen were mainly characterized by the ester methyl hexanoate with pineapple notes. Similar results were obtained with HFMS. CDA also showed that it is possible to classify samples according to days of shelf-life and that the effect of gas conditions was smaller than the effect of days of shelf-life.