Relation between different aroma extraction techniques and sensory perceived quality

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Aim

To elucidate which aroma extraction technique is the most suitable in expressing the sensory perceived aroma and flavour composition of carrots.

Conclusion

SPME, dynamic headspace extraction and solvent extraction resulted in three distinct aroma profiles of carrot (Fig. 1).

Results

Dynamic headspace and SPME extracted more of the very volatile compounds than solvent extraction, which on the other hand extracted several non-volatile compounds.

Background

Different aroma extraction techniques can result in different aroma profiles of the same food product, but a sensory analysis can be used to characterize the true aroma profile. Consequently it can be useful to deduce which aroma extraction technique is the most representative of the aroma profile determined by sensory analysis. The aroma volatiles of carrot (Daucus carota) consist mainly of terpenes, and the sensory attribute green carrot top flavour have been found to be well predicted by the content of terpinolene, \( \gamma \)-terpinene, limonene, \( \beta \)-myrcene, \( \beta \)-pinene and sabinene.

Materials and method

3 varieties: Bolero, Nipomo, Mello Yello.

3 extraction methods: Dynamic Headspace, Solvent extraction, SPME.

Quantitative descriptive analysis: 8 assessors, 10 replicates.

Sensory analysis showed significant differences between the varieties for the attribute green carrot top flavour. All extraction methods showed significant difference between the carrot varieties, when looking at the total aroma compounds contributing to green carrot top flavour.

References