Sensory Assessment meets Odorant Analytics

Character Impact Compounds in Strawberry flavored Dairy Products and their potential Correlation to Consumer Preference

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Background and Objectives

Sensory impression of food is often caused by a mixture of several volatile compounds, whereof only a small group has an impact on the overall flavor.

Strawberry flavor, for example, is caused by more than 350 volatile compounds, whereby furaneol and mesufurane, various esters, linalool, and 2,3-butandione have been identified as the dominating compounds. Studies, made on the correlation between the impact compounds and the sensory properties have shown that furaneol strongly correlated with the sensory descriptors caramel/sweet-like and Z-3-hexenal contrary strongly correlated with the green odor impressions. To date, a clear link between aroma composition and consumers preference could not be found. Thus, the aim of this approach is to classify the character impact compounds of flavored dietary supplements that potentially correlate with consumer preferences.

Approach

- Detection of the relevant odors of 12 strawberry flavored dairy products by means of high resolution gas chromatography olfactometry (HRGC-O) and aroma extract dilution analysis (AEDA)
- Identification of the trace components with the highest dilution factors using two-dimensional HRGC-O mass spectrometry (2D-HRGC-O/MS)
- Determination of further analytical parameters such as fat and protein content and the typeof thickening agents and sweeteners.
- Sensory analyses – performed by both a trained panel (descriptive analyses – objective data) and a consumer panel (acceptance measurement – hedonic data).
- Evaluation of the analytical data and the sensory (hedonic and objective data) by means of multivariate statistical methods in order to determine whether the different variables correlate which one another.

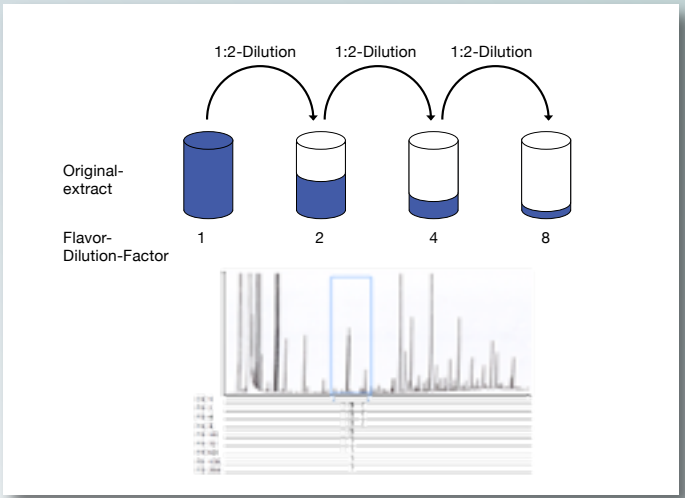

Fig. 1: Principle of the aroma extract dilution analysis (AEDA)
By using further procedures such aroma extract dilution analysis (AEDA), the odorants with the highest odor impact will be ascertained.

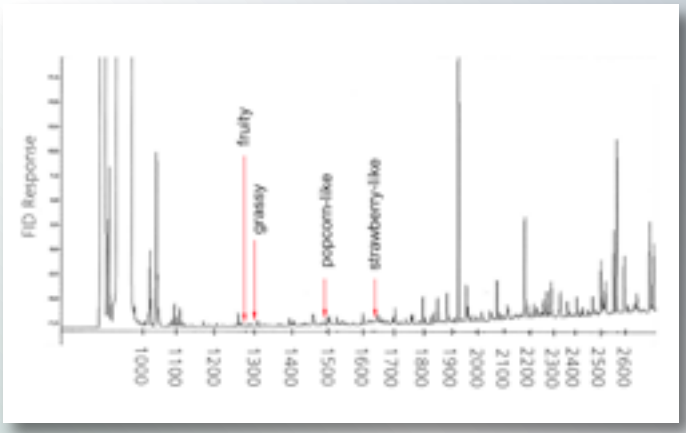

Fig. 2: GC-olfactometry - a representative chromatogram labelled with odor impressions.
The use of GC-O enables differentiation between odor-active and odorless substances. Accordingly, a large portion of the detected volatile compounds can be filtered out when evaluating the results.

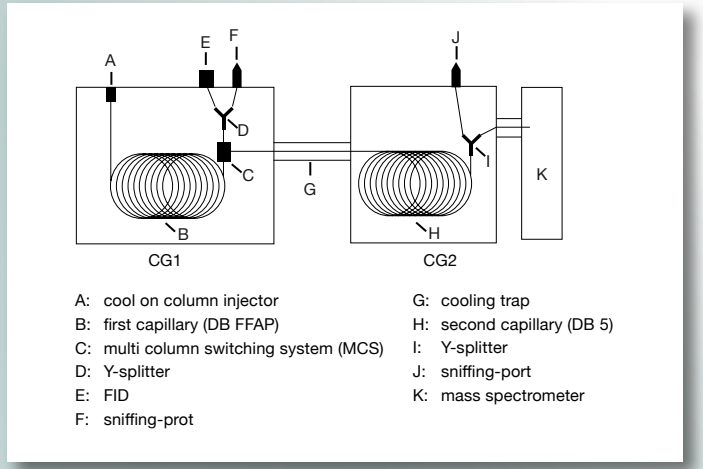

Fig. 3: A schematic of the 2D-GC-MS/O
The criteria of identification are based on:
- retention indices (RI) on at least two chromatographic columns of different polarity
- mass spectra via both electron impact (EI) and chemical ioni-

Benefits

The findings of this approach may provide an important contribution to future product development, for example in terms of the use of those ingredients (e.g. strawberry cultivar, strawberry pulp, type of proteins) and technologies having a positive influence on the aroma and flavor profile of flavored protein drinks linked to a high level of consumer acceptability.

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