

Sensomics: understanding flavor properties in food.

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1. Introduction

DSM Food Specialties develops and sells process flavors that help our customers to get authentic meaty flavor into food.

Understanding flavor at molecular level and the impact on sensory flavor perception, enables steering of the desired product properties during processing.

This poster presentation outlines the workflow we have developed to identify mutual relations between metabolites and sensory attributes.

2. Approach

Thirty different commercially available DSM process flavors were characterized both in sensory as well as chemically. For sensory evaluation, QDA (Quantitative Descriptive Analyse) was done with a trained Savoury panel (n=12) on 46 attributes in odour, flavor and mouthfeel.

To cover the broadest possible range of chemical compound classes, an untargeted sensomics approach was developed that combines four different complementary analytical methods to analyze the volatile and non-volatile metabolites that are possibly related to the flavor of our process flavors. The non-volatiles were analyzed by NMR and a GC-FID/MS method in combination with oximation and silylation. All volatiles were analyzed by an SPME-GC-FID/MS method. LC-MS was done for general profiling of peptides up to about 15 amino acids.

3. Results

Sample preparation and method development was done for all four analytical methods. Using these methods, all process flavors were characterized successful. Multivariate data-analysis was applied to identify possible correlations between the chemical analytical data and sensory data.

Visualization tools are optimized and together with DSM colleagues in Savory Ingredients, more detailed data mining is being done to be able to translate to answer business questions.

4. Discussion

A holistic metabolic profiling was applied to develop model to describe flavor in our process flavors. For this we have a workflow set-up and now an integrated team is in place.

The emphasis of this poster presentation will be on overall approach.