

## KN01- Modern strategies and techniques of analysis of the volatile fraction as a tool for food control and characterization

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The volatile fraction of a food and in particular its aroma is an important "signature" that not only plays a fundamental role in food choice but also in its characterization, quality assessment and genuineness. Sensory analysis is still the reference *criterion* to define the food quality; nevertheless, it still is a critical and sometimes subjective evaluation because a) of the rather limited number of expert tasters, b) it is time-consuming and requires repeated experiments, and c) the number of samples that can be processed every day is not unlimited.

The introduction of Metabolomics by Oliver et al. in 1998 [1] and Molecular Sensory Science or Sensomics, by Schieberle and Hofmann in 2011 [2] and, above all, the related strategies and methods have substantially influenced also the analytical approach to flavor (i.e. aroma, taste and texture) analysis. In analytical terms, these disciplines imply a comprehensive and quantitative analysis of the largest possible array of low molecular weight components (<1,000 Da) in the investigated samples [3]. The application of the metabolomics strategies to the everyday analyses in the food field have involved the development of dedicated approaches affecting the chemical analysis, the best known of them being Fingerprinting and Profiling, and their practical application has resulted in different methods commonly known as untargeted and targeted methods. The general thrust has therefore been to develop inclusive instrumentation where the "sample preparation-analysis-data elaboration" sequence are on-line merged into a single step, that is toward the so-called "Total Analysis Systems" (TAS) introduced by Manz et al. in 1990 [4]. Analysis of the food volatile fraction is perfectly compatible with TAS, as they require a single-step and highly representative sample preparation techniques, at the same time easy to automate and to be online combined with GC or GC-MS providing highly reliable and diagnostic data suitable for on-line processing.

This contribution will be an overview with examples taken by the authors' everyday experience on food volatile fraction analysis to show how modern analysis technology can be applied to monitor food quality and characteristics in routine.

### References:

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- [3] J.L. Wolfender et al. Current Medicinal Chemistry, 2013, 1056-1090
- [4] A. Manz, N. Graber, H. M. Widmer, Sensors and Actuators: B. Chemical, 1990, 1(1-6), 244-248

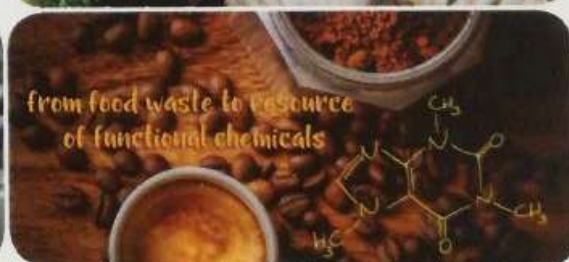


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