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e Salute



## **Food volatilome fingerprinting by biomimetic system and headspace solid-phase microextraction and gas chromatography-quadrupole time-of-flight/mass spectrometry (HS-SPMEGC-QTOF/MS)**

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Food aroma profile is characterized by a complex mixture of many components at very low concentration which are responsible of food distinctive identity and has a great importance in consumers' preferences. .

Well known is, in fact, that a priming role in eating behavior plays odors and food choice and intake strongly depends on its intensity. Food choices are mainly conditioned by sensory aspects and above all by the aroma of foods, while, only later, other factors, including nutrient content or health aspects, are involved.

The most important aromatic compounds include compounds derived from the pools of carbohydrates, amino acids, fatty acids and include a very large and heterogeneous group of molecules that have both saturated and unsaturated structures, straight chain, branched chain or cyclic characterized by functional groups and/or by the presence of nitrogen and sulfur which can be grouped in relatively few chemical classes, mainly: aliphatic esters, alcohols, aldehydes, ketones, lactones, terpenoids.

As widely known food volatile substances (VOCs) following interaction with human receptors, encode their aroma and taste.

So, the aim of our work was the development of study, with the aim of characterizing the volatiloma fingerprinting of foods by development of a non-targeted volatile metabolomic approach based on GC-QTOF/MS coupled with solid phase microextraction and organoleptic fingerprinting by Ultra-Fast GC, and *biomimetic system*.

Focusing on the aroma profile and volatile constituents, even if gas chromatography/mass spectrometry (GC/MS) is the technique widely used for both qualitative and quantitative analysis, among the combined techniques, attention has recently been focused on the application of high-resolution quadrupole time-of-flight mass spectrometry (QTOF/MS) which allows a more accurate identification. QTOF/MS provides both a high spectral sensitivity with a high mass resolution, and structural elucidation with high resolution spectrum of product ions. GC-QTOF/MS has an application potential in qualitative analysis of great interest. Thanks to these features, which improve selectivity, sensitivity and accuracy, the application of the GC-QTOF/MS in qualitative analysis, seems to be of great interest.

*Odour/taste Map fingerprinting* has been determined by Ultra-Fast Gas Chromatography (UFGC), an analytical technique used for rapid acquisition and analysis of the sample's headspace which has been shown to be applicable to trace and ultra-trace analysis of volatile and semi-volatile compounds and e-tongue.

