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Consumer Perceptions and Expectations in Chain Management of Fruit & Vegetable Quality?

Release of the results of research of the COSIVEG programme

13 - 14 JANUARY 2014 IN ANGERS
Innovative methods measuring Sensory interactions

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Keywords
Cross modal interactions, aroma, taste, texture, volatile compounds, sensory analysis, artificial mouth, fruits

How consumer’s food acceptance can be explained by the interactions between aroma, taste and texture during the consumption of real foods like apples

Abstract

In-mouth perception of food is complex and due to a tricky combination of aroma, taste and texture perceptions. Together, these three modalities are key factors that determine consumer’s food acceptance. Whereas lots of studies had been done to study cross-modal interactions between aroma, taste and texture perception in food, few of them had been able to determine the relative contribution of each modality to the global perception of complex food products without using model food matrices [1]. Our study deals with the development of two original concepts. The former aims to decrypt aroma, taste and texture interactions and the latter to understand their relationships with the physicochemical properties of food product.
Therefore, the relative contributions of aroma, taste and texture modalities to overall perception, as well as the interactions which can occur between them, were studied during the consumption of real foods as apples.

We developed an innovative sensory approach [2] where aroma, taste and texture perceptions were masked by using different masking agents, allowing then to omit one or several of these sensory modalities during various matching tasks. A multiblock data treatment methodology called Common Components and Specific Weights Analysis (CCSWA) [3] was used to analyse data set issued from rating and matching sensory experiments. Taste was the modality which contributed the most to the discrimination between apples. It was followed respectively by texture and aroma modalities. While taste and texture did not seem to show cross-modal interactions, a binary taste-taste interaction was shown between sweetness and acid taste. In a similar way, cross-modal interactions between olfactory and gustative perceptions were demonstrated.

To go further, the Food Aroma Research Group of ONIRIS (UMR GEPEA 6144 GEPEA) has developed an original system, named the MMS “Mouth to Nose Merging System” dedicated to establish the relationship between cognitive perception and the physicochemical properties of a food product [4]. This innovative device combines artificial mastication, aroma release with human sensory evaluation. Judges were asked to eat an apple piece, inducing texture and taste perception, while another odorant extract obtained by artificial mastication was sent to the nose of judges. This method allowed us to understand how orthonasal aroma influenced aroma, taste and texture perception. An integrative device of “in mouth simulator” named AMADEUS is also now available to analyse aroma and taste components during mastication [5].

To conclude, these whole strategies applied on apples have permitted to describe cross-modal interactions and posed hypothesis concerning their physico-chemical, physiological or cognitive origins.

References


