



Taking the Time to Taste

Developments in Temporal Sensory Methods

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Taking the Time to Taste: Developments in Temporal Sensory Methods

In this paper, Silvia Peleteiro guides you through a set of methodologies called temporal methods which measure the sensory profile of a product as it changes during consumption. These methods can help manufacturers and product developers understand the complex sensory profile of sweeteners and create sweetener blends which match consumer sensory requirements.

Adding the time dimension to taste

Traditional consumer and sensory methodologies have generally focussed on how a product is perceived overall and usually give a fixed output describing the characteristics of a product.

The sensory perception of food and drinks, however, is a dynamic process that changes throughout the period of consumption. Some flavour notes or sensations are perceived more at first bite or sip while others are perceived during chewing or after swallowing as an after-taste or after-feel.

Sensory methods are now being developed to capture the different dimensions of sensory perception in a much more nuanced way. Temporal methods describe a set of methodologies which seek to measure the sensory profile of a product as it changes over time during the consumption of that product.

The right time for temporal methods

Temporal methods have some key areas of application in the food and beverage industry.

They have particularly relevance for products or ingredients with an aftertaste, such as coffee, chocolate and wine, where manufacturers want to understand how consumers perceive the diminishing flavour of these different products. To substantiate a 'longer-lasting flavour' claim for a chewing gum, for example, temporal methods would be used.

Temporal methods have also proved an effective way to explore sensory response to product texture. This is particularly relevant in the development of products for people whose health may impact their oral processing of foods, such as older people.

Measuring the complex sensory profile of sweeteners

One important use for temporal methods is in understanding the sensory profile of sweeteners or sugar and sweetener blends. In light of the continued pressure on the industry following the UK's Scientific Advisory Committee on Nutrition (SACN) report and the proposed UK sugar tax, due to come into force in 2018, sugar reduction or replacement

remains a key focus for the food and beverage industry.

Replacing sugar in products poses technical and food safety challenges for product developers and manufacturers. Sugar or sucrose, for example, does not only contribute flavour and taste to a product but also bulk and textural properties. Sugar-free and sugar-replaced products can behave differently over shelf-life compared with conventional products containing sugar.

There are also the sensory challenges to consider. Sweeteners generally have a more complex sensory profile than sugar and some sweeteners have negative aftertastes, such as bitterness or a metallic taste, which need to be masked or minimised by the formulation. Thus, measuring the sensory profile of the sweetener ingredients used and the profile of the end product containing sweeteners is important.

Limitations of traditional sensory methods

Most research exploring sensory response in the field of sugar reduction/replacement to date have used traditional sensory profiling. This gives an overall intensity score for each of the sensory attributes which are perceived. The disadvantage of this methodology is that the developer does not know at what point during consumption the characteristics are perceived. Where temporal methods are used, it is generally a method called Time Intensity (TI) which has proved popular. This method adds the time or temporal dimension, but the disadvantage is that it only measures the intensity or strength of one sensory characteristic.

TDS method gives more nuanced sensory profile of product

Temporal Dominance of Sensations (TDS) and variants of this technique are now gaining more traction in the industry. The advantage of this method and the reason why it is an ideal method for evaluating sweeteners is that it makes it possible to identify the most dominant sensation perceived at the exact time-point during evaluation (first bite/sip, chewing or after-taste) when the change is perceived. This is particularly useful as the evolution of sweetness perception can have an influence on the perception of other sensory attributes.

Understanding these nuances will give vital insights to product developers who are aiming to formulate a sugar reduced or sugar free product that closely matches the sensory perception of the original sugar containing product. It will help them understand where they need to focus their reformulation efforts, for example whether they need to mask a bitter taste perceived only at the 'finish' of the product or to increase the firmness of the product at 'first bite'.

Ultimately, these new methods enable manufacturers to get a much more nuanced picture of the sensory profile of their products and ensure they are creating products which match consumer taste.

How Leatherhead can help

Leatherhead Food Research regularly uses temporal methods as part of client projects and closely follows developments in these methods to ensure we deploy the most relevant methods for the ingredient or products we are evaluating. If you are interested in learning more, please contact the Insight team: insight@LeatherheadFood.com

About the author

Silvia Peleteiro manages the Applied Research team within the Consumer, Sensory and Market Insight department at Leatherhead. Her role includes investigating new methodologies and supporting clients with panel screening, training and validation, coordinating the delivery of standard and tailored training courses and answering client enquiries. Silvia graduated from the University of Madrid, Spain, with a BSc in Nutrition and a BSc in Food Science from the University of California, Davis with a Sensory & Consumer Science Certificate. She joined Leatherhead in 2011.

About Leatherhead Food Research

Leatherhead Food Research provides expertise and support to the global food and drink sector with practical solutions that cover all stages of a product's life cycle from consumer insight, ingredient innovation and sensory testing to food safety consultancy and global regulatory advice. Leatherhead operates a membership programme which represents a who's who of the global food and drinks industry. Supporting all members and clients, large or small, Leatherhead provides consultancy and advice, as well as training, market news, published reports and bespoke projects. Alongside the Member support and project work, our world-renowned experts deliver cutting-edge research in areas that drive long term commercial benefit for the food and drink industry.

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