

1 Introduction

It is estimated that 75% of new products fail within their first year on the supermarket shelf (Buisson 1995) and that, as a consequence, considerable resource invested in product development is squandered (Deschamps and Nayak 1996). Sensory attributes, whether the flavour of coffee, the smell of an air freshener, the texture of fabric or even the sound of a car door closing, are key determinants of product delivery including quality, functional and emotional benefits. Thus, a considerable proportion of product failure can be attributed to a mismatch between sensory properties and consumer needs or expectations. When integrated within the product development process, sensory and consumer testing allows cost-effective delivery of acceptable products to consumers and thus reduces the risk of failure (Lawless and Heymann 1998).

1.1 What is sensory evaluation?

Sensory evaluation is often described using the definition of Institute of Food Technology – a scientific method used to evoke, measure, analyse and interpret those responses to products as perceived through the senses of sight, smell, touch, taste and hearing (Anonymous 1975).

Since its emergence in the 1940s, however, sensory evaluation has developed as an exciting, dynamic, constantly evolving discipline that is now recognised as a scientific field in its own right.

The sensory professional is routinely confronted with problems which call upon an extensive skill set drawn from a range of disciplines, e.g. biological sciences, psychology, experimental design and statistics and will often be required to work with other specialists from these areas. Additional challenges are presented by working with a human ‘measuring instrument’ that is highly variable.

Sensory evaluation can be divided into two categories of testing: objective and subjective. In objective testing, the sensory attributes of

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a product are evaluated by a selected or trained panel. In subjective testing, the reactions of consumers to the sensory properties of products are measured. The power of sensory evaluation is realised when these two elements are combined to reveal insights into the way in which sensory properties drive consumer acceptance and emotional benefits. Linking sensory properties to physical, chemical, formulation and/or process variables then enables the product to be designed to deliver optimum or appropriate consumer benefits.

1.2 What is the role of sensory evaluation?

The role of sensory evaluation has changed considerably over the years. Initially, it was a service provider supplying data, but now its role is, in partnership with R&D and marketing, to provide insights to help guide development and commercial strategy.

From product conception to post-launch monitoring, sensory professionals can be called upon to inform decision-making during the stages of a product's life cycle. Sensory and consumer testing can also provide insights into human behaviour and perception at a more fundamental level.

In the early stages of product development, consumer and sensory testing can help identify the important sensory attributes driving acceptability across a product category. It can identify sensory-based target consumer segments, analyse competitor products and evaluate new concepts.

Combining data from sensory and instrumental testing may provide insights into the chemical and physical properties, driving sensory attributes. Where significant correlations exist with sensory data, it may be possible to dispense with the use of a sensory panel, in favour of a more cost-effective instrumental test, e.g. in quality testing.

Sensory testing can determine the impact of scaling up kitchen and/or pilot samples to large-scale production and is invaluable in determining whether raw ingredient changes or modifications to the production process, e.g. for cost reduction or change of supplier, will impact on sensory quality and/or product acceptability.

In terms of quality assurance, it can be used as part of a QA programme on raw materials. In addition, sensory testing can set consumer acceptability limits for sensory specifications used during quality testing. For those products susceptible to taints, sensory testing can ensure sub-standard products are not released onto the market. For many products, the sensory properties deteriorate ahead of microbial quality and so, in tandem with microbial tests, sensory testing can be used to determine shelf life and product variability through the supply chain.

From a marketing perspective, sensory and consumer testing can inform understanding concerning product preferences and acceptability. It can provide the data to support marketing claims such as ‘best ever’, ‘new creamier’, and ‘most preferred’. It can also ensure that sensory properties work in synergy with brand communication and advertising.

Sensory and consumer testing is widely employed in the research arena. It is used at a more fundamental level to investigate new technologies to aid product development and to understand consumer behaviour. Furthermore, multidisciplinary investigations linking sensory testing with, for example instrumental analyses, brain-imaging techniques, psychophysical tests and genomics provide a wider understanding of the mechanisms involved in sensory perception and the variations that exist within the population.

1.3 What drives successful sensory testing?

Successful sensory testing is driven by setting clear objectives, developing robust experimental strategy and design, applying appropriate statistical techniques, adhering to good ethical practice and successfully delivering actionable insights that are used to inform decision-making. Appropriate training is crucial to ensure that the sensory professional has the necessary technical capability and interpersonal skills.

The aim of this book is to provide new and current sensory professionals with a firm foundation in the above principles in a practical, easy to follow format.