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A Sensory Journey to Healthier Eating; How Sensory Cues are the Hidden Ingredient in Future Healthy Diets

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Food has no nutritional value until it has been chosen, accepted and consumed. The sensory experience of eating is an important determinant of food intake control, often attributed to the positive hedonic response associated with certain sensory cues. Sensory Science has been traditionally focused on quantifying perception and relating this to food preferences. Yet beyond their role in palatability, a foods sensory cues play an important *functional* role in guiding energy intake and dietary patterns and can be used to better understand and promote improved dietary patterns and energy intake. The overarching goal of my research is to apply an understanding of how sensory perception influences food choice and intake behaviour and to use this to develop strategies aimed at preventing or reducing the risk of chronic disease through improved nutrition.

The foods we choose, and the quantity and frequency with which we consume them are the difference between good health and diet-based chronic conditions such as diabetes and obesity. Today we know more about food and what it does to our body, than we do about why consumers choose certain foods or the factors that influence meal size and habitual intakes. The lecture will provide examples of how understanding the role of sensory properties (i.e. taste, texture/structure) can help to address some of today's biggest public health challenges. We know taste properties influence our food choice behaviour, but can dietary taste-exposure influence our preferences? Recently, the i-Sense randomised controlled trial has explored this, and highlights how challenging it is to shift consumer preferences for sweet foods by taste-exposure.

A food's structure directly influences how we eat, and the kinetics of post-meal metabolism, such as glucose responses, satiety per calorie, and even our microbiome metabolite production. These insights offer new opportunities to tailor food structures that target the delivery and release of nutrients for better metabolic health. Recent debates in nutrition have often been dominated by the need for a better understanding of factors that can influence energy intake from (ultra)processed foods. Our research has shown that consumers adapt their eating behaviours in response to meal textures, which in turn can influence the rate and extent of energy intake. Within the recent RESTRUCTURE randomised controlled trial we demonstrated how meal texture and eating speed have a sustained effect in moderating energy intake from diets dominated by ultra-processed foods. These findings contribute to a better mechanistic understanding of how food properties can influence energy, and offer new opportunities to apply sensory cues to support healthier diets in the future.

Addressing the serious public health challenges posed by the modern food environment require changes in dietary patterns and eating behaviours that are easy for consumers to adopt. Applying Sensory cues to improve nutritional behaviours and moderate intake and metabolism makes it possible to inform the development of successful dietary strategies while keeping 'eating enjoyment' and satisfaction at the heart of future efforts to improve diets and human health.