



How visual cues can influence taste

Visual cues embedded in products can trigger past experiences you had with similar foods. These reactivated past experiences serve as a backdrop and filter for the way you perceive food. This is one of the reasons why visual cues can influence your perception of food and the associated flavour. With this in mind, we showed 151 consumers rice samples, with and without a visual cue. These cues visually mimicked the presence of added herbs. In 'normal life' added herbs are associated with an increase in flavour. In our experiment however, the added visual 'herb' had no flavour, as verified with blind taste testing. Participants rated the flavour intensity of the rice samples with two separate sensory methodologies (i.e. gLMS, ranking). In addition, they tasted rice with various concentrations of monosodium glutamate to test if the magnitude of effect of flavour enhancing visual cues was similar to the effect of MSG on flavour enhancement. The results show that visual cues can indeed increase perceived flavour intensity of rice. The magnitude of the effect was similar to that of a low concentration

of MSG (i.e. 0.05M). This is the first study which shows that the perceived flavour intensity of a rather bland staple food, such as rice, can be increased by changing the look of a product without adding any flavour enhancers such as salt or MSG. And any strategy that may potentially decrease the level of sodium in a food has benefits for the health of the population. The next phase of research should look at if the increase in perceived intensity also increases the liking of the rice. Next time you eat rice...take it with a pinch of visual cue.

Hartley L, Russell CG, Liem DG. (2021). "Addition of a visual cue to rice increases perceived flavour intensity but not liking." *Food Research International* 139, 109922. <https://doi.org/10.1016/j.foodres.2020.109922>

How does food product reformulation affect consumers?

Many food businesses have targets and commitments around reformulating their products to improve their nutrition composition. The introduction of the Health Star Rating System to Australia in 2014 also prompted further reformulation efforts, while consumer demand for

access to a wider range of healthier products is also driving change. Common targets for reformulation are reducing energy, sodium and sugar. Reformulation of existing products can be risky if the sensory attributes of the product are affected and consumers no longer purchase the reformulated product. Reformulation will also provide limited benefit to health if consumers compensate for consuming the reformulated products by consuming greater amounts of the reformulated product, or by adding alternative unhealthy products to their diets. Understanding the impact of reformulation on consumer behaviours is therefore imperative for understanding the success of reformulation to achieve diet and health targets and to provide confidence for food manufacturers embarking upon reformulation that it is a worthy exercise. A recent meta-analysis by Gressier *et al*, showed that reformulated products were, on the whole, accepted by consumers and reformulation did not negatively impact purchasing behaviours. This meant that the nutrient profile of a consumer's diet generally improved when the reformulated products were

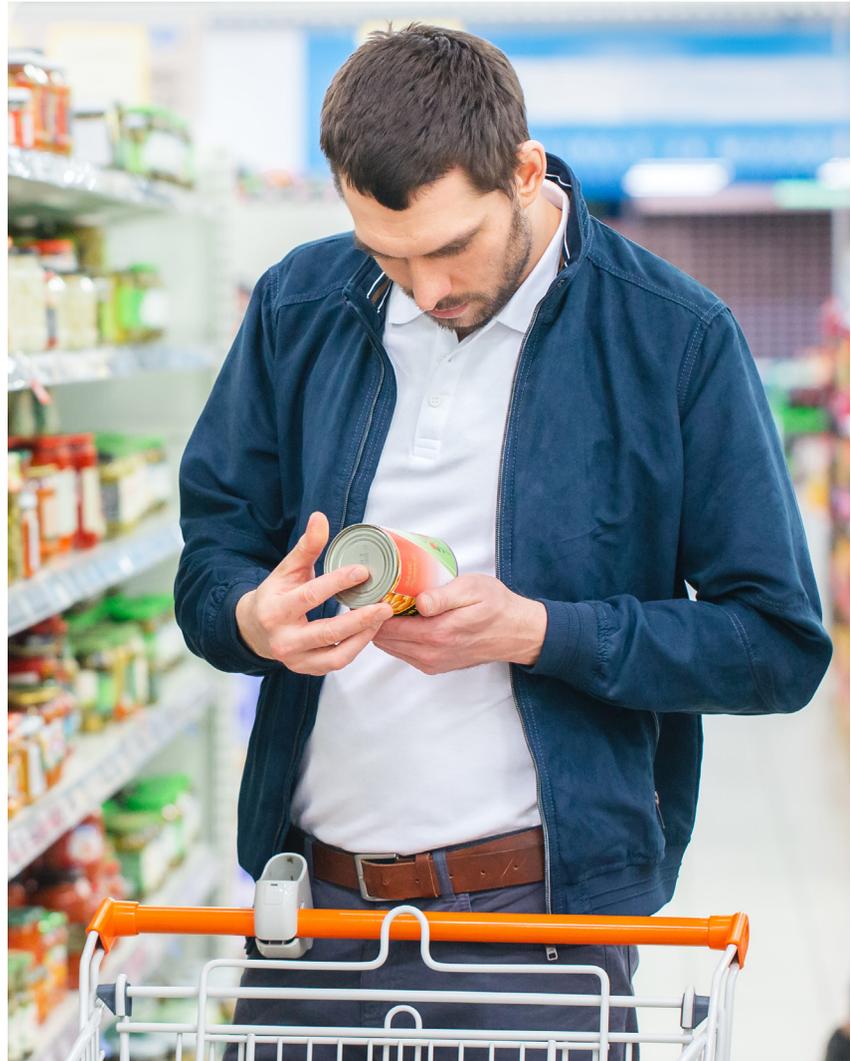
included. The analysis also showed that products with reduced sodium were more readily accepted than those with reduced sugar and that silent reformulation was more successful than a rapid change. It should also be noted that, in general, the proportion of sugar or sodium that was reduced in the included studies was low, but this was also dependent upon the food category. Although there is still much to be done to understand the most effective approaches for food product reformulation, this latest research suggests that it is an important and effective measure for improving the health of the population.

Gressier M, Swinburn B, Frost G, Segal AB, Sassi F. (2020). "What is the impact of food reformulation on individuals' behaviour, nutrient intakes and health status? A systematic review of empirical evidence." *Obesity Reviews* <https://doi.org/10.1111/obr.13139>

Food labels may influence health more than once realised

Food labels are an important part of food products. They provide the essential information for a consumer to understand the 'healthiness' of a product. Health and content claims are often cited on food labels to highlight the particular healthy aspects of a food (i.e. low in sugar, sugar free) which can help provide consumers with an overall perception of healthiness. Interestingly, the perception of healthiness may be just as important as the actual nutrient content of a food product. A recent study from Harvard University has investigated how food labels can influence the health outcomes of the consumer, in this case how the amount of sugar on a label affects blood glucose levels. Large raises in blood glucose are a marker of poor nutrient metabolism and are associated with negative health outcomes.

The study tasked 30 participants with type 2 diabetes to consume two beverages on separate occasions: one labelled as having 0g of sugar (0 calories) and the other labelled as having 30g of sugar (124 calories). In reality, both beverages were identical with 15g of sugar (62 calories). Despite



being identical, the physiological response to these beverages differed. Blood glucose levels were higher after consuming the 'high sugar' beverage compared to the 'sugar-free' beverage for at least 1-hour post-consumption. This may be because the perception of sugar content changes the way the body prepares itself for nutrient metabolism and is a clear demonstration of the gut-brain axis in action.

So, what does this mean for food labelling? Obviously, modifying food labels to appear 'healthier' so consumers have a better metabolic response isn't a viable option. But this does highlight the importance of food labels. There is merit to the concept of wellness, where if a consumer perceives they are living a healthier lifestyle and eating healthier foods, then their body systems will react in

kind. Nutrition claims on a food label may be a boon to manufacturers as consumers become more aware of wellness. Of course, the cynical argument would be that some discretionary foods could be labelled to mislead consumers about their actual nutritive and health effects. All in all, nutrition claims are an important part of food labels, and emphasising these claims (i.e. low in sugar) may have more benefit to health than initially realised.

Park C, Pagnini F. & Langer E. (2020). "Glucose metabolism responds to perceived sugar intake more than actual sugar intake." *Sci Rep* 10: 15633. <https://doi.org/10.1038/s41598-020-72501-w>

Dr Russell Keast is Professor, Dr Gie Liem is Associate Professor, Dr Georgie Russell is Senior Lecturer and Dr Andrew Costanzo is Lecturer. They are all members of the CASS Food Research Centre at Deakin University.