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TASTING THE RAINBOW

Colour is the most influential sensory cue when it comes to consuming food & drink, setting our expectations on what the likely taste and flavour will be. Even science and business are studying the phenomenon.

WORDS BY JANET STONE

We learn throughout our lives to associate flavours and colours together as we encounter them, explains Professor Joanne Hort. "Colour is a really good indicator of flavour, and it's partly because vision is our primary sense and also because our brain tends to believe what it sees," says Professor Hort, who is Fonterra-Riddet Chair in Consumer and Sensory Science, FEAST (Food Experience and Sensory Testing) Lab, at Massey University.

One of the earliest studies in this field of research by Cynthia DuBose and others in 1980 showed that colour masking (green, red, orange) dramatically decreased flavour identification of fruit-flavoured beverages. Nearly 20% of participants reported the drink tasted of orange when the cherry-flavoured solution was coloured orange, whereas no participants thought the same drink was orange flavoured when it was coloured red, green or remained colourless. Also, colouring the same orange-flavoured drink green led to 26% of participants identifying it as lime flavoured, whereas no-one thought it was lime flavoured when the drink was coloured red or orange.

COLOUR SATURATION

It's not just the colour but the strength of the colour, also known as colour saturation, that influences our flavour perception. With more vibrant colours people expect more vibrant flavour, says chef George Clegg, Cuisine Lecturer at Le Cordon Bleu Brisbane. "Food designing starts with seasonality," he says. "Nature has a funny way of producing amazing colours at different seasons and that's my starting point to create dishes that look fresh and look good to the eye."

The natural ripening process and its associated colours influence our perception of taste and flavour, explains Professor Hort. "With the ripening process from green to red, for example in a tomato or pepper, people associate green with bitterness and red with sweetness. So even if something isn't sweeter, but it's red in colour, we'll perceive it to be sweeter because that's what we encounter in natural food products."

Research by Charles Spence at the University of Oxford on the psychological impact of food colour reported that pink and red were most strongly associated with sweetness; yellow and green with sour; white and blue with salty; and browny/black and purple (or possibly green) with bitter. The piquant or spicy sensation associated with eating chillies was found to be associated with the colour red. Stronger colours also increase the perceived flavour of foods, says Professor Hort. "When increasing the colour or decreasing the colour intensity, people will perceive things to be higher or lower in intensity of that flavour, even though it's got the same amount of flavour stimuli in the product."

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Chef Jane Collins says colour and texture are equally important when visually anticipating taste. "If you've got a beautiful Vietnamese salad with charred chicken and you put some red chillies in there, some white bean sprouts and some fresh green leaves, you instantly know even if that chicken is hot because of the chilli it's going to be cooled down by the bean sprouts and by the fresh flavours of the Vietnamese mint and Thai basil, because they all complement each other. And then you sprinkle some roasted rice on there or crispy shallot and what you get in your mouth is the hot, the crunch and also the cooling down from the bean sprouts and herbs." A 2022 study from the University of Portsmouth found that even plate colour impacted flavour, particularly for fussy eaters. The study served the same snacks on red, blue and white plates. Specifically, the snack was rated as higher in saltiness in the red and blue versus white bowl, and least desirable when served in the red bowl.

EVOLUTION OF COLOUR AND TASTE

Mixing up traditional food colours is being seen more in the cultivation of crops, with purple cauliflowers and broccoli appearing on the supermarket shelves in recent years. Both chefs and food companies play around with flavour and colours to discombobulate their flavour and taste associations, such as Heston Blumenthal's experimental approach and Heinz's release of a green ketchup.

Colouring foods to be more appealing has a long history. Butter has been artificially coloured in winter for centuries to give it the consistent rich golden colour that consumers expect throughout the year. Nowadays marketing companies carefully research what will make their products more visually appealing to their customers and use colourants accordingly if needed.

"Over the last 60 years, dishes have become a lot brighter, with different food being introduced from different palates around the world, such as Asian food here in Australia," says Clegg. "People expect there to be something a little bit different in their food these days, and bright colours are definitely a way of showing that expectation."

As the nights grow colder, golden yellows and amber tones infuse autumn meals with a sense of warmth and comfort. Pumpkin, carrots and parsnips offer a sweet, nutty flavour that pairs perfectly with autumn's cooler temperatures, while beetroot and turnips add earthy sweetness to soups and stews. The colour green remains a constant presence in autumn dishes, providing a vibrant counterpoint to the rich hues of the harvest.


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