



Taste disorders are often associated with smell disorders because up to 80 per cent of one's sense of taste relies on the sense of smell, says ear, nose and throat surgeon Annabelle Leong. PHOTO: ISTOCKPHOTO

It can mean illness or nutrient deficiency, say doctors



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Would you try electric lemonade? Researchers from the National University of Singapore (NUS) have devised a drinking glass, programmed by a cellphone app, which stimulates the tongue to perceive different flavours, including citrus.

Taste is a complex sense and a taste disorder usually signals another health condition, such as infections or nutrient deficiencies.

Some patients infected with Covid-19 reported a loss of taste along with smell and, in a few, the smell and taste disorders persisted a year after infection.

Taste disorders are often associated with smell disorders because up to 80 per cent of one's sense of taste relies on the sense of smell, says Dr Annabelle Leong, an ear, nose and throat surgeon with clinics at Mount Elizabeth Novena Hospital and Gleneagles Hospital.

In the case of a Covid-19 infection, the virus attacks cells which support the function of olfactory nerves responsible for smell, she adds.

"Such patients find themselves unable to distinguish between sweet and bitter substances. They may also notice that they no longer have the ability to detect chemically triggered sensations such as spiciness, a condition called chemesthesis."

The support cells can regenerate within two weeks, so patients may find their sense of smell and taste returning, says Dr Leong.

"Some patients also notice unpleasant odours from substances that used to smell fine, a condition called parosmia. For example, some patients have complained that meat now tastes like petrol."

A small number of patients may not regain their sense of taste or smell, even months after recovering from Covid-19 – part of a syndrome called "long Covid". It is still unknown why.

Experts say that experiencing flavour is more than the ability to distinguish among tastes. Humans can perceive five tastes – salty, sweet, sour, bitter and umami – as sensory cells in the tongue, commonly known as taste buds, detect different chemicals.

However, flavour is a sensory perception that results from a combination of taste, smell and other stimuli. Presentation, temperature and texture contribute to flavour and how an individual judges whether food is tasty.

At the Cute Centre run by NUS and Japan's Keio University, researchers are working on creating

digital flavour. Cute stands for Creating Unique Technology for Everyone.

The centre's Virtual Cocktail project, or Vocktail, is a glass with electrodes and a scent chamber. A cellphone app programmes a combination of lights, smell and electri-

cal stimulus to the tongue. With the right combination, water can taste like a flavoured drink. This reporter tried the virtual lemonade – it has a fizz and a decidedly citrus kick.

Mr Pravara Jain, a research associate at Keio-NUS Cute Centre who

is an expert in digital gastronomy, says it is now easier to augment flavour than create it from scratch.

"We've managed to create digital salt and deliver aromas, such as lemon, with a soft drink in the Vocktail."

Salty, bitter and sour tastes are the easiest to replicate digitally at present. Creating sweet and umami tastes requires larger, more complicated mechanisms, so do not expect to be drinking virtual hot chocolate soon.

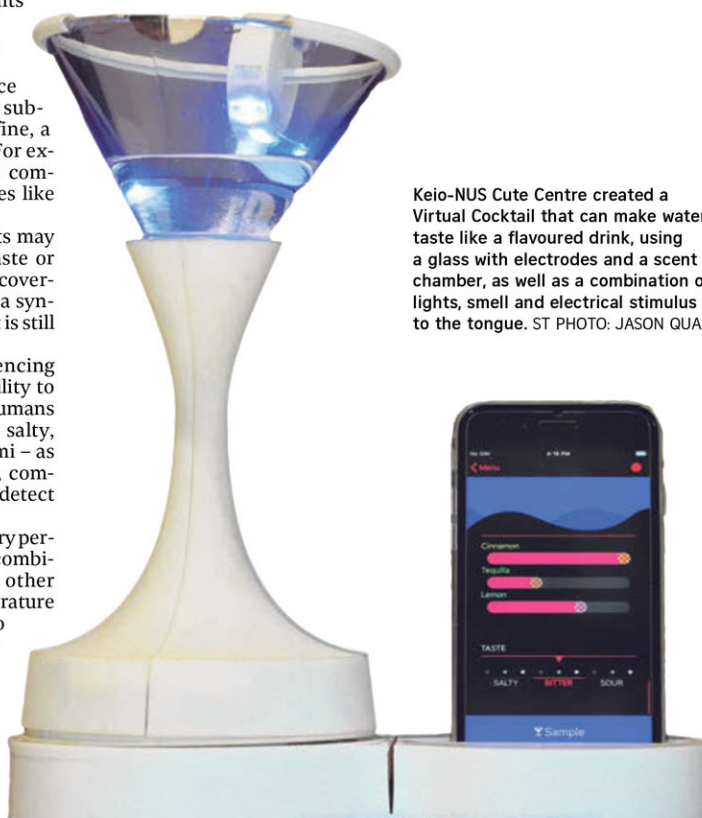
"Flavour is based on your overall experience and comes from colour, what you see, and what you smell," says Associate Professor Yen Ching-Chiuan, co-director of Keio-NUS Cute Centre. He is also dean's chair associate professor, division of industrial design. "The flavour of chocolate is associated with a sweet taste. If you don't detect that sweet taste you expect, that's the end of the story."

The virtual cocktail may be on the market soon. Planned pilot tests and public launches have been delayed by the pandemic.

Another Keio-NUS Cute Centre project is immersive virtual-reality game *The Lost Foxfire*, in which the approach of the target leads to players feeling heat and smelling the scent of apples.

Meanwhile, the Cute Centre project named Taste+ created items – a spoon, chopsticks and a bowl – that deliver electrical impulses to the tip of the tongue and cause users to perceive salty, sour or bitter tastes.

AGEING ALSO AFFECTS SENSE OF TASTE continued on C2



Keio-NUS Cute Centre created a Virtual Cocktail that can make water taste like a flavoured drink, using a glass with electrodes and a scent chamber, as well as a combination of lights, smell and electrical stimulus to the tongue. ST PHOTO: JASON QUAH

Ageing also affects sense of taste

FROM C1

Health-conscious users can potentially programme these items to enhance flavour so they can reduce the amount of salt in their food. Such items could also help enhance flavour for older people – as humans tend to find the sense of taste changing or weakening with age.

Dr Chan Kin Ming, a geriatrician at Mount Alvernia Hospital, says the ability to distinguish the tastes of sweet, salty, sour and bitter foods is affected from age 60.

“Between the ages of 40 and 50, the number of taste buds decreases, and the rest begin to shrink, losing mass vital to their operation. This may not be a sign of illness, but can be the physiological effects of ageing,” he adds.

“Different individuals age at different rates, so they may have variable degrees of loss of taste. Some are so mild that they are not noticeable, some are severe enough to cause loss of appetite.”

About 20 per cent of his patients complain of alterations to the sense of taste, but a minority of these are age-related complaints.

The majority are because of dis-

ease, including chronic kidney disease, chronic liver disease, zinc deficiency or vitamin B12 deficiency.

Certain medications can alter the sense of taste, as can dental and gum diseases, or the habit of smoking.

Dr Chan recalls a patient who lost weight over a year because of altered taste.

“She was unable to eat because not only did her food taste ‘funny’, but it also all tasted spicy – hot – even when she ate bland food.”

Subsequent tests showed that she was deficient in vitamin B12.

“When her low vitamin B12 was replaced, her sense of normal taste returned, so did her appetite, and her weight returned to normal,” he adds.

In many cases, the cause of taste impairment remains unknown, says nutritionist Sarah Sinaram, manager, nutrition and dietetics, at Mount Alvernia Hospital.

Taste changes can negatively affect quality of life and result in inadequate intake of nutrition, which leads to health issues.

Malnutrition in older people is a concern for Singapore’s ageing society. In January, a study reported that four in five Singaporeans over 65, who did not eat enough pro-

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tein, were at risk of malnutrition and had low muscle mass. The study by researchers from Changi General Hospital, SingHealth Polyclinics and healthcare company Abbott suggested that malnutrition in the elderly could be addressed through nutritional supplements and dietary counselling.

Ms Sinaram has several tips to enhance the eating experience for older people whose sense of taste is affected.

She suggests including a variety of colours and textures – brightly coloured vegetables such as carrot, sweet potato, broccoli and capsicum – and flavouring the food with fresh herbs, such as lemongrass, kaffir lime, scallion, coriander and pandan leaves.

Season with caution if the person eating has hypertension or diabetes.

“It’s good practice to serve condiments sparingly in a small serving dish, rather than liberally use them,” she says.

A recent study of older adults living in a nursing home showed an increase in meal enjoyment and energy intake when a variety of main dishes and several condiments were offered throughout the meal, she notes.

Similarly, another study aimed at

encouraging food consumption in older people with Alzheimer’s disease found that shape, contrast – separating foods rather than mixing them – and adding sauce made a difference. The diners were more likely to consume finger foods with sauce and contrast, rather than foods where all the ingredients were mixed together.

“These findings are at odds with some of our typical Asian foods, such as porridge with all the ingredients mixed in. It would be better to serve the sides separately instead,” she says.

Dr Chan also says that taste, presentation and temperature of food are important in coaxing people with diminished taste or taste alterations to eat. But the social aspect of eating should not be neglected.

“To improve the ability of the elderly to eat, we need to make meals a social and fun event. People tend to eat more and enjoy their food better when they eat, talk and laugh together.”

He adds: “Try new food or new ways of cooking. Lastly, give sufficient time for them to eat and savour the food rather than rush through a meal.”

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