

**CCCHWC Science Society Newsletter (Sound of Science) April 2024**  
**Q&A in Food Science**

Question in the Month: How does scientist define the degree of spiciness?  
Send your answer to s201901056@ccchwc.edu.hk.

Is MSG Bad for Our Health?

As you may know, monosodium glutamate (MSG) is a popular flavoring for food. However, it is commonly deemed unhealthy or even harmful, and that food containing no MSG is the best. However, is MSG really that horrible?



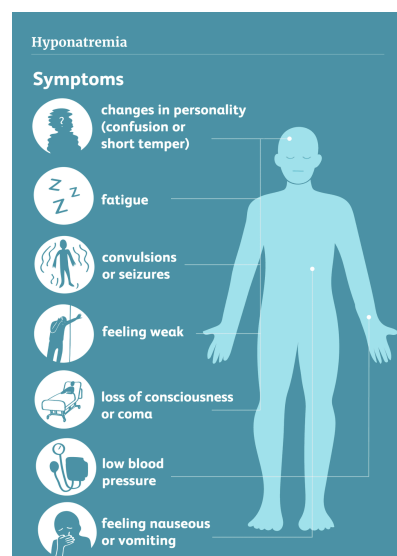
In fact, MSG is not a human invention. It occurs naturally in food, contributing to savoriness (aka umami, one of the five basic tastes). Scientists in the past extracted MSG from seaweed, but now it is mainly produced by fermentation. So, food claiming to be “MSG Free” might also be misleading, as MSG is naturally present in some foods.

Though it is widely believed that MSG can cause headaches, there has been little scientific evidence to support this. Research has been done about the relationship between headache and MSG ingestion, with and without food, as the body deals with glutamate differently under the two conditions. No significant difference is observed when people intake MSG with food, while relations can be seen when people intake high concentration MSG without food. However, since MSG can be distinctively identified at high concentrations, further studies with more proper blinding are needed to reach a solid conclusion.

Moreover, it is possible that table salt (sodium chloride) causes headaches instead of MSG because table salt causes hyponatremia when overly absorbed. The



median lethal dose (LD50) of MSG is 15 g/kg in rats, five times that of sodium chloride. That means MSG is even less lethal than table salt for rats.



Food scientist Steve Witherly suggests cooking with a mixture of salt and MSG. He stated that MSG might even promote healthy eating by reducing salt usage. For example, Italian cooks often use Parmesan cheese, which contains 1200 mg of MSG per 100 g of cheese.

In conclusion, you can use MSG like any other seasoning. Just remember not to use too much or eat it alone!

## Why is Chill Pepper So Spicy?

Chill peppers are known for being spicy. It is used in many dishes as seasonings and enjoyed by lots of people. But have you ever thought about how chili peppers get their hot and spicy taste?



To begin with, we should be aware that spiciness is not a flavour. It is instead just a pain signal sent by the nerves that transmit temperature sensations. This burning sensation from chillies is mainly caused by a chemical called capsaicin, which



is found in tiny glands in the chilli's placenta (the white spongy layer you can find inside chillies).

When you eat chili, the capsaicin is released into your saliva and binds to a special type of receptor (TRPV1 receptors) in your mouth and tongue, which are there to detect the sensation of heat. Capsaicin makes your mouth feel as if it is on fire because the capsaicin molecule happens to fit into the receptors perfectly. When this happens, it triggers these receptors, which send signals to your brain, fooling it into thinking that your mouth is burning.

But why do chili peppers produce capsaicin in the first place? This was to protect themselves from being eaten by mammals like us. However, we humans seem to like this suffering. Why is that? This is because eating

spicy food can cause us to release endorphins, which give you an instant feeling of pleasure from head to toe. People crave the spiciness to experience the thrill and pleasure of this pain.

So, is there a way to effectively ease the heat? Yes! You may have heard that drinking milk can do the job, but why is that? Well, capsaicin is soluble in milk and



alcohol, which can easily wash the capsaicin away from the receptors, so milk is indeed capable of cooling the heat. However, capsaicin repels water, so it remains on your tongue. When you can't bear the heat next time, try drinking milk instead of water.

### Relaxing Zone

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**We are also recruiting the committee members for 2024./25!  
For F1 - F4 students who are interested, please contact 5D Lee Yiu Sing  
or Mr. Lau Chi Kin. Let's promote Science together!**

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