

I PEOPLE

# General Chemistry Experiments on the Kitchen Counter

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During the tasting session, speaker Stalu (right) invites members of the audience to experience the differences created by various cooking conditions.

"This chicken breast was cooked sous vide at 58°C. This one at 59°C. And this batch was marinated in an isotonic sports drink..."

The aroma of freshly prepared food drifted through the foyer outside the lecture hall. During the intermission, speaker Stalu invited members of the audience to sample chicken breasts prepared under different sous vide conditions, letting them experience how subtle changes in temperature and osmotic pressure transform flavor and texture.

Observing the audience's surprised reactions, he smiled and said, "Just one degree makes a huge difference, doesn't it?"

The tasting was part of "A Guide Before the First Bite," a public science lecture series organized by National Taiwan University's Center for the Advancement of Science Education (CASE). The fifth lecture, "General Chemistry Experiments on the Kitchen Counter," was presented by Stalu—a former private chef and



Stalu recalls spending nearly 30 hours making liver pâté in his laboratory during his student years. (Photo courtesy of the NTU Center for the Advancement of Science Education.)

culinary consultant who now runs the popular science-focused YouTube channel *TasteThisGOOD*—who shared many of the experiments he has conducted in the kitchen.

"I believe great food comes from science," Stalu declared. His pursuit of deliciousness, he confided, began with a jar of pink liver pâté. After combing through academic papers, he discovered that maintaining the ambient temperature at around 60°C precisely controls the denaturation of hemoglobin and myoglobin, giving the pâté its distinctive pink color. For Stalu, understanding the science behind flavor makes it possible to adapt recipes under different cooking conditions with confidence. "Cooking has never been about blindly following a recipe," he stressed.

Building on this idea, Stalu introduced the key scientific principles, such as temperature and osmotic pressure, then illustrated how they can be applied in the kitchen. He noted, for example, that the flavor compounds in spices can be either fat-soluble or water-soluble, reflecting that cooking with oil or water releases different flavors. Likewise, because capsaicin, the compound responsible for the heat in chili peppers, is fat-soluble, milk is far more effective than water at relieving spiciness.

How, then, can we discover the best flavor a food has to offer? Stalu encouraged the audience to stay curious and keep experimenting. Recalling one of his own investigations, he described comparing Iberian pork with Dongbao Black Pork from Pingtung. Using a carefully controlled experimental design and double-blind testing to eliminate preconceived expectations, he arrived at an unexpected conclusion: most participants could not reliably distinguish between the two pork varieties. The experience reinforced his belief that scientific thinking not only helps us understand food more deeply but also challenges our assumptions about ingredients.

Exploring everyday food culture as a gateway, the lecture series introduces audiences to the science embedded in daily life. According to CASE Executive Director Yi-Te Lai, enticing audiences to attend in-person events has become a new challenge in science communication in the post-pandemic era. To make science more engaging, the Center has incorporated hands-on experiences throughout the series, encouraging the participants to explore scientific concepts through all five senses.

Future lectures in the series will further examine the science behind what we eat, covering a range of topics from food safety, environmental sustainability, and kitchen science to Taiwanese rice evaluation systems, fermentation cultures, and developments in animal husbandry. By starting at the dining table, the series continues to unveil the rich scientific knowledge behind everyday food.



Chicken breasts prepared sous vide under different temperatures and osmotic pressure conditions, each producing its own distinctive texture and flavor.



CASE Executive Director Yi-Te Lai (left) and curatorial advisor Stalu (right) designed the lecture series around the core idea of "preparing a table full of delicious dishes," to create a program that is both informative and enjoyable.