Media Contact: Nick Kordsmeier [nkordsme@uark.edu](mailto:nkordsme@uark.edu) 479-575-6368

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**‘Sustainable sensory science’ method offers panelists safe, realistic conditions**

By Brittaney Mann

U of A System Division of Agriculture

## Fast facts

* Sensory Science Center director presented new testing method at IFT conference
* Drive-in booth testing is a promising alternative to indoor sensory testing
* The method is now being tested to compare with in-home sensory testing

(1,030 words)

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FAYETTEVILLE, Ark. — The director of the Arkansas Agricultural Experiment Station’s Sensory Science Center presented a new sensory testing method at the annual Institute of Food Technologist’s FIRST (Food Improved by Research, Science and Technology) event in Chicago on July 12.

When the COVID-19 pandemic halted necessary sensory testing activities, Han-Seok Seo, associate professor of sensory and consumer science for the experiment station, the research arm of the University of Arkansas System Division of Agriculture, and director of the Sensory Science Center, developed an alternative to indoor sensory testing with a drive-in booth method.

At the Institute of Food Technologists (IFT) meeting, Seo spoke in a panel discussion titled “What are recent advancements in sensory science that will lead to new products or methodologies?” His discussion has [on-demand access](https://ift22.mapyourshow.com/8_0/sessions/session-details.cfm?scheduleid=127).

“Sensory evaluation is a very critical component of food and non-food industries,” Seo said. It is involved in many sections of the industry like quality assurance, marketing and product development.

The results from the tests show the drive-in booth method is an effective, reliable and valid alternative to indoor booths, Seo said.

Even though the method was made with pandemic and epidemic concerns in mind, it is also applicable outside of those concerns, Seo said. For example, a university or business that does not have access to a sensory lab could conduct sensory testing using this method.

“A method should also be sustainable,” Seo said. The method’s ability to exist in pandemic, epidemic and normal conditions make it part of “sustainable sensory science.”

**Drive-in Sensory Testing**

“The most important thing during COVID is we need to bring both researchers and panelists into the testing place,” Seo said. “No one wants to take a risk during COVID because of this testing.

“I did my best to set up a safer condition both physically and emotionally,” Seo said.

While driving in Fayetteville, Seo passed a drive-in theater. It occurred to him that the drive-in setting can have uses beyond entertainment. He could create an alternative to the indoor laboratory setting for sensory testing.

Seo has tested the drive-in method under three different conditions: test samples with big differences, test samples with subtle differences and a validation test. He has [published a peer-reviewed article about one](https://doi.org/10.1016/j.foodqual.2021.104332), and plans to publish his research on the other two soon.

To control outdoor factors in the drive-in booth, panelists had to remove any scents from the cars, set their air conditioning to a specific temperature, drive their own cars and come alone.

For the first condition, panelists tasted four drinks with significant sensory differences — lemonade, black tea, vegetable juice and coconut water. They were split into two groups. One group tested drinks with the drive-in booth method, and the other group tested drinks with the indoor booth method. The groups switched after their initial tests.

The panelists also rated their reactions to drinks using positive or negative emotion-related terms.

“We could not see any differences between the two groups in terms of sensory perception, liking and emotional responses to the food,” Seo said.

For the second test, panelists evaluated products with more subtle differences — four types of yogurts. It followed the same steps as the first experiment.

The third condition had a different structure than the previous tests. Seo brought in new people and the two groups stuck with one test area rather than switching as in the first two conditions. They also retested one week after the initial test.

Seo found no significant differences between drive-in and indoor booths after those tests. He examined the engagement, safety and realism responses of the panelists after each test.

“Our research shows people can feel more realistic when they participate in the drive-in booth condition rather than in the indoor facilities,” Seo said.

“Companies want to listen to more realistic insight or opinions from natural settings,” which is why they use home-use testing, Seo said.

Many food companies test products in different environmental conditions by changing macro- and microenvironmental factors, Seo said.

In studies conducted on consumer perception of coffee, microenvironmental conditions like the [shape](https://www.sciencedirect.com/science/article/pii/S0950329318300855?via%3Dihub), [color](https://www.sciencedirect.com/science/article/pii/S0950329318310012?via%3Dihub) and [texture](https://www.sciencedirect.com/science/article/abs/pii/S0950329319308572) of the cup caused differing results. Experiences in coffee consumption also varied at a macrolevel, as seen in previous research testing coffee consumption in a [laboratory, a café and an immersive simulated café](https://doi.org/10.1016/j.foodqual.2020.103934).

**Competing Methods**

Some sensory professionals used at-home methods to continue sensory evaluation during the pandemic, Seo said. Those are based on non-face-to-face contact in the home or with outside booths.

The at-home methods consist of two types, home-use testing and in-home testing.

The home-use testing condition enables panelists to prepare and evaluate test samples and react to them in a real and naturalistic setting such as at home, and this method was used before the pandemic. In-home testing, an alternative to laboratory testing, requires panelists to evaluate test samples under a controlled setting at home.

“It is difficult to control the test samples or test conditions at home,” Seo said.

There could be unexpected distractions like a baby laughing or crying, an external visitor's doorbell sound in the background or outdoor sounds in the case of the outdoor booth, Seo said.

The in-home testing works for items like cookies, but when temperature-sensitive foods need to be delivered, there can be changes in texture, flavor, and other factors because of variations in post-cooking time and sample temperature during delivery, Seo said.

COVID-19 was an obstacle for Seo, but it helped inspire the creativity to create a new method, he said.

“I hope this method can be beneficial to not only myself, but also other peers, food industries and non-food industries, so they can continue sensory evaluations,” Seo said.

At the IFT meeting, Seo said he had many chances to discuss the drive-in booth method with other sensory professionals that have interest in using it. He was able to share his team’s stories and how they navigated the COVID-19 pandemic to continue sensory evaluation. His next experiment focuses on using drive-in sensory booths to compare with in-home testing conditions.

“I would like to give special thanks to my team members and test participants,” Seo said. “Without their help, it would have been impossible to conduct this research itself in a time of pandemic.”

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