

# Scientists promote soy by currying favor with Indian taste buds

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University of Illinois scientists think they have solved an interesting problem: how to get protein-deficient Indian schoolchildren to consume soy, an inexpensive and complete vegetable protein. What's more, they've joined forces with an Indian foundation that can get the high-protein soy snack they've developed into the hands of 1.2 million hungry kids who need it.

"Although the country has decidedly vegetarian tastes, the Indian people just don't care for soy," said Soo-Yeun Lee, a U of I associate professor of [food science](#) and [human nutrition](#).

India is one of the world's top five soy producers, but the country exports most of its crop, keeping only the oil for domestic consumption. That's unfortunate because 24 percent of India's population is undernourished, and [protein](#) deficiency is an even greater concern. Eating more soy could help to alleviate that problem, the researcher said.

Because Indians are avid snackers, Lee and her U of I colleagues experimented with nine soy snack recipes, running into minor bumps along the way due to the ability of [soy protein](#) to bind flavors, which causes flavor fade and makes the soy taste more pronounced.

The extrusion process the food scientists were using also increased the snack's hardness when more protein was added.

Those problems solved, Lee and her colleagues moved onto the next

phase of the project—consumer taste tests. Seventy-two members of a surrogate Indian population in the Champaign-Urbana area were asked to participate in a sensory panel.

Snacks that were crunchy, salty and/or spicy, and contained umami, cumin, and curry flavors received high marks from participants. Panelists turned thumbs down on snacks with rougher, porous textures and wheat flavor and aroma.

The soy snacks were then given to a 62-member sensory panel recruited at the International Society for Krishna Consciousness Temple in Bangalore, India.

The final formulation included chickpea flour, a staple in Indian cuisine that provides a preferred texture and flavor, and such spices as cumin and red chili pepper.

The U of I scientists began working with Bangalore's Akshaya Patra Foundation, a non-governmental organization that runs one of the largest school meal programs in the world. The foundation now feeds over 1.2 million underprivileged Indian children a day.

"A free school lunch is a powerful incentive for Indian children to attend school. When families are living in poverty, parents often keep their kids at home because they're more valuable there doing chores or selling goods on the streets," Lee said.

Not only that, research shows a correlation between school lunches that are high in protein and increased student performance. Having a protein deficiency at an early age can also cause future medical problems, so providing enough protein for these children who are hungry and getting just one meal per day at school is important, she added.

The foundation has acquired an extruder so they can make the snacks for their school lunch program and, as further testimony of the recipe's likability, sell them in the temple gift shop, she said.

"I'd have to say that our attempts to make a [soy](#) snack that appealed to Indian tastes were pretty successful. Sensory scientists are important for their ability to make nutritious foods bridge cultural divides," she said.

**More information:** The research is described in articles in the August 2010 issue of Journal of Food Science and the July 2010 issue of the Journal of Sensory Science.

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