Scientists identify natural compounds that enhance humans' perception of sweetness

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(Medical Xpress)—University of Florida taste scientist Linda Bartoshuk and her colleagues want to play a trick on you—but it's for your own good.

The UF team has identified a group of naturally occurring compounds that enhance the way people perceive sweetness, and believe that those compounds can be used to make foods taste sweeter using far less sugar and no artificial sweetener.

The group, which includes eminent scholar Harry Klee and professors David Clark and Charles Sims, all of UF's Institute of Food and Agricultural Sciences, has collaborated for several years on flavor- and aroma-related research studies. Bartoshuk is a professor with UF's Center for Smell and Taste, part of the UF College of Dentistry.

UF technology licensing officials are seeking companies interested in finding ways to turn the researchers' findings about flavor into a commercially viable product that can be used to sweeten foods and beverages in a natural, more healthful way. Klee and Bartoshuk will make a presentation in February about the work at the American Association for the Advancement of Science meeting in Boston.

The natural sweetener discovery was made during the group's work, led by Klee, to break down the chemistry behind the complex flavors in tomato.

During that research, genes and biochemical pathways responsible for producing the volatile chemicals that give fresh tomatoes their characteristic flavor and aroma were chronicled, and nearly 100 tomato varieties were tested by scientists and also used in taste tests by 13 panels of 100 people who rated each tomato's taste.

They knew that there are two ways humans evaluate smell: Orthonasal, or through the nostrils, and retronasal, behind the palate while eating. In retronasal olfaction, smell and taste interact.

Capitalizing on interactions between retronasal olfaction and taste, the food industry has sometimes used sugar to intensify people's perception of specific flavors.

Following the tomato taste panels, Bartoshuk had reams of information about the chemical makeup of tomato fruit and everything that had been gleaned from the taste panels about what tasters liked and didn't like.

To discern which factors were playing the biggest roles in people's tomato-taste preferences, she used statistics to examine how the fruit's sweetness was explained both by flavor ratings and sugar content.

"If the sweetness is all due to sugar, then that's the only variable that would've been significant," she said. "But flavor was highly significant. So suddenly we knew that the volatiles were making independent contributions to the perceived sweetness."

The UF team's findings were solidified by similar analysis following a study of taste in strawberries.

"It turns out that fruit has been using this mechanism forever and we didn't know it," Bartoshuk said. "So when you bite into a strawberry, you think when it tastes sweet, you're tasting sugar. But 10 percent of that

'sweet' is in the volatiles. And we didn't know that. So lo and behold, we get all of these data and we do the math, and we're stunned—we have a new source of sweetness, we create it in the brain, with volatiles."

Klee said the potential applications for a natural sweetener are vast and reducing the amount of sugar used in processed foods can only be good for people.

"The fact is that people really like sweet," he said. "And if we can make foods taste as sweet as they currently do without adding sugar? That's really exciting."

Provided by University of Florida

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