

# White House chef whips up desserts with chemistry

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White House pastry chef Bill Yosses spoons nectarine foam into a dessert bowl in Washington Saturday, Feb. 19, 2011, during an American Association for the Advancement of Science presentation on the science of taste. Yosses told scientists chefs are changing perceptions of tastes. Some sweetened tangerine juice, a little soy protein, a blender and there's a trendy, frothy dessert or a lesson in kitchen chemistry? His point: Texture plays a huge role in taste. (AP Photo/Jacquelyn Martin)

(AP) -- Some sweetened tangerine juice. A little soy protein. A blender. Voila: A trendy, frothy dessert becomes a lesson in kitchen chemistry.

It turns out the chef who whips up pies for the president is also a bit of a scientist - calling on knowledge of how to help bubbles hold their shape and how crystals affect chocolate and salt, in the quest for healthier goodies.

You wouldn't think taste tests would be on the menu, er, agenda when the American Association for the Advancement of Science assembles some of the world's leading molecular biologists and [geneticists](#) and astronomers for a once-a-year look at exciting discoveries.

But White House pastry chef Bill Yosses exchanged his white apron for a bow tie Saturday to talk with scientists about how chefs are changing perceptions of taste. He brought samples - chocolates that gleamed, and that tangerine foam that held up spoonfuls of juicy berries for about an hour.

His point: Texture plays a huge role in taste.

Consider chocolate mousse with its sumptuous mouth feel, caused largely by added cream that, Yosses notes, also clogs arteries. He substitutes water and gelatin for cream to deliver that feel with less fat.

Or take that tangerine foam. The [soy protein](#) helps form structures around the [air bubbles](#) from Yosses' blender. Look, he said as he spooned a plateful: "It's just tangerine juice, but we can fill the whole plate."

Maximize texture to maximize a taste, Yosses said, and suddenly people are happy with fewer bites - a message that goes hand in hand with the healthy-eating mantra of his bosses, President [Barack Obama](#) and first lady Michelle Obama. Dessert in moderation, he said, can be part of a healthy balanced diet.

"What chefs want to achieve with modern cooking is a kind of fascination with food" that also is "able to move people toward a healthier approach to eating," Yosses told the researchers.

In fact, the science of taste is a booming field. It tells us that taste is incredibly complicated, an interaction of the tongue, the nose, psychological cues and exposure to different flavors.

Kraft Foods research scientist Jane Leland brought samples, too - yellow jelly beans. Pinch your nose closed, she told the crowd. Now take a few chews of a jelly bean. It tastes sweet, from taste receptors on the tongue.

OK, release the nose and chew some more. Whoa, now lemon flavor bursts forth. Aroma molecules move through the back of the mouth to the nasal cavity and reach the olfactory bulb, she explained.

For all its cellular commonalities, taste is incredibly individual - and our earliest exposures to different foods helps determine the flavors we like and dislike, said Gary Beauchamp of the nonprofit Monell Chemical Senses Center in Philadelphia.

Components of flavor can transmit in amniotic fluid, Beauchamp said, citing a study that gave carrot juice to women in the last trimester of pregnancy. At age 6 months, babies drank carrot juice for the first time, and those who'd been exposed in the womb liked it more than babies who hadn't been exposed.

A different study examined how babies react to a special hydrolyzed-protein formula that may help them digest but that Beauchamp said tastes "just awful." Babies given it before they're 3 months old don't mind; they suck down bottles with gusto. But if they don't taste it until they're older? A video showed a tot's whole face screw up in a grimace as he pushed the bottle away.

Infants similarly develop a preference for saltier foods the earlier they taste them, he said, and that's important because Americans eat more than double the amount of salt necessary for good health.

That brings us back to the texture lesson from the White House's Yosses. Sodium is sodium whether it's in the fine grains of the typical salt shaker or large chunks of trendy sea salt, he said.

But larger crystals melt more slowly on the tongue, so sea salt can be "very satisfying," he said. That's why he uses that type for salted caramel.

"It really is texture as [taste](#). But if you're going to do that, you have to reduce it (sodium) somewhere else," he said.

In the same way, the quality of chocolate depends on how its sugar crystals line up, Yosses said. The best literally shines and causes "a nice crack when you bite." That crunch lets Yosses get away with thin layers of chocolate in a dessert "that's more satisfying even though it's small."

**More information:** Monell Chemical Senses Center:  
<http://www.monell.org>

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