

Thanksgiving table chemistry

November 23 2010, By Chris Gorski



A Thanksgiving dinner table. Credit: AF.mil

What's going on at Thanksgiving dinner? Sure, Uncle Al is asleep in front of the football game and the kids are running around the table rather than sitting at it, but just how in the name of inane parade play-by-play did that pop-up timer manage to tell you when to take the bird out of the oven?

Answering those questions and many others like it requires some knowledge of simple chemistry.

Diane Bunce is a chemical education researcher at Catholic University in Washington, D.C. who thinks it's important that everyone learns at least a little chemistry.

"I love the chemistry-phobic students because it's great to be able to

show them that they really can succeed at chemistry," Bunce said.

In her course for non-science majors, Bunce covers [Thanksgiving](#) dinner, with a big helping of demonstrations and yes, taste tests.

The students probably don't anticipate that they'll be asked to chew on raw potato and paper and compare the two. The big difference between these items -- and one reason why we don't sup on mashed notebooks -- is that the long chains of sugars that make up both of them are linked together in different ways. Our bodies need enzymes to break down those links and digest the sugars, but we don't have one for the link in paper's bonds.

Could you please pass the turkey?

Sure, if you can answer this question: How did the chef know the big bird was ready to be removed from the oven?

Bunce knows the answer to that. Did you know the pop-up device that releases when the turkey is done is not technically a timer or a thermometer? When Bunce cut one open, it revealed a spring stuck to the end pushed into the turkey, secured by a blob of solder. When the turkey reaches about 185 degrees Fahrenheit, the solder melts, triggering the spring and the popper. Done!

I'd like some more gravy, please.

Making gravy, unless it comes pre-thickened from a jar, requires a thickening agent. Corn starch and flour are common choices. Though they both thicken the gravy by attracting water molecules to them, they work differently. For its volume, corn starch has much more thickening power than flour and, because of the size of the molecules that it brings together, gives the gravy a reflective sheen. Flour is a bit easier to work

with at low temperatures but because it contains molecules that appear more opaque, it will not have the same shine. And, since it takes more flour to do the same job, it has more effect on the flavor.

After it's all over, what do you do if heartburn is preventing that much-deserved post-gorge nap and somebody already took the last antacid? Your fridge most likely contains a simple remedy.

Baking soda is the active ingredient in popular antacids and acts to settle the churning in your stomach. That, ahem, effervescent effect that seems to emerge in the form of a belch or two -- that's just carbon dioxide, the product of the neutralizing reaction, escaping.

Bunce's course covers all sorts of phenomena that are impacted by [chemistry](#), aiming to help people gain the skills that help them think for themselves. "We want people to understand the science behind issues and to know how to find out more information," she said. "It's a filter through which you look at life."

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