

What did the scientist say to the sommelier? 'Show me the proof!'

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What does lemon pan sauce chicken have to do with biochemistry and molecular biology? If you ask the students in Joseph Provost's class at Minnesota State University Moorhead, they'll tell you that successful execution of the dish requires the Maillard reaction, a chemical process that's responsible for the flavors and colors in a variety of food, including toast and maple syrup.

In Provost's class, [students](#) are asked to do what would be unthinkable in a traditional science course: eat the results of their experiments.

"There are a few universities that teach this class, but I wanted to use the theme to bring science to a wider audience," Provost explains. "There is a ton of interesting biochemistry, chemistry, biology and physics involved with cooking, and all of it can be brought to this topic." Each section of his course is about food -- and explained with all of the interesting science involved. Provost says, "That is different than many courses, where the application is at the end of the chapter."

On Sunday, April 22, Provost will share with other educator-scientists his recipe for making science accessible to liberal arts students with the hope that they, too, will cook up innovative teaching techniques. His presentation will be part of the American Society for Biochemistry and Molecular Biology annual meeting, held in conjunction with the Experimental Biology conference in San Diego.

Begun in the fall of 2010, Provost's Science of Cooking class draws

about 150 students each semester and requires 12 hours of lab experience, which can be acquired in either the lecture hall or in students' homes. Together with a team of faculty, he hopes to create a textbook that can be used for non-science majors throughout the United States.

One (in-class) experiment covers freezing point depression through ice-cream making. "Students work in groups using various salt solutions to measure freezing point depressions, create secondary plots to determine trends and analyze the impact of salt and sucrose on making ice cream," Provost says. Later the students use a scientific approach to how biological molecules impact the taste of ice cream. He also uses convection, microwave and induction cooking teach the physics behind heat transfer.

Dishes such as cheese soufflé are used to examine protein denaturation and gas laws. Meanwhile, marinating shrimp is used as a launching point for discussions of acid denaturation of meats and how free amino acids affect taste.

"There are a lot of ways to get people interested in [science](#). I think this a great way to show how biochemistry can daily impact their life," Provost says. "It also makes them a much better cook!"

Provided by American Society for Biochemistry and Molecular Biology

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