

When the Sous-Chef Is an Inkjet

A glimpse at the future of food

Homaro Cantu's maki look a lot like the sushi rolls served at other upscale restaurants: pristine, coin-size disks stuffed with lumps of fresh crab and rice and wrapped in shiny nori. They also taste like sushi, deliciously fishy and seaweedy.

But the sushi made by Mr. Cantu, the 28-year-old executive chef at Moto in Chicago, often contains no fish. It is prepared on a Canon i560 inkjet printer rather than a cutting board. He prints images of maki on pieces of edible paper made of soybeans and cornstarch, using organic, food-based inks of his own concoction. He then flavors the back of the paper, which is ordinarily used to put images onto birthday cakes, with powdered soy and seaweed seasonings.

At least two or three food items made of paper are likely to be included in a meal at Moto, which might include 10 or more tasting courses. Even the menu is edible; diners crunch it up into a bowl of gazpacho, creating Mr. Cantu's version of alphabet soup.

Sometimes he seasons the menus to taste like the main courses. Recently, he used dehydrated squash and sour cream powders to match a soup entrée. He also prepares

edible photographs flavored to fit a theme: an image of a cow, for example, might taste like filet mignon.

“We can create any sort of flavor on a printed image that we set our minds to,” Mr. Cantu said. The connections need not stop with things ordinarily thought of as food. “What does M. C. Escher’s *Relativity* painting taste like? That’s where we go next.”

Food critics have cheered, comparing Mr. Cantu to Salvador Dali and Willy Wonka for his peculiarly playful style of cooking. More precisely, he is a chef in the Buck Rogers tradition, blazing a trail to a space-age culinary frontier.

Mr. Cantu wants to use technology to change the way people perceive (and eat) food, and he uses Moto as his laboratory. “Gastronomy has to catch up to the evolution in technology,” he said. “And we’re helping that process happen.”

Tucked among warehouses and lofts in the Chicago meatpacking district, Moto attracts a trend-conscious crowd. Some guests leave scratching their heads; others walk away spellbound by a glimpse of Mr. Cantu’s vision of the future of food.

William Mericle, 41, described a recent meal at Moto as “dinner theater on your plate.” He did not care for all 20 small dishes he sampled, but he said he liked most of them. He found Mr. Cantu’s imagination appealing. “He’s mad-scientist-meets-gourmet-chef,” he said. “Like Christopher Lloyd from *Back to the Future*, if he were more interested in food than time travel.”

Mr. Cantu believes that restaurant-goers, particularly diners who are willing to spend \$240 per person for a meal (the cost of a 20-course tasting menu with wine at Moto), are often disappointed by conventional dining experiences. “They’re sick and tired of steak and eggs,” he said. “They’re tired of just going to a restaurant, having food placed on the table, having it cleared, and there’s no more mental input

into it other than the basic needs of a caveman, just eat and nourish.”

At Moto, he said, “there’s so much more we can do.”

Mr. Cantu is experimenting with liquid nitrogen, helium, and superconductors to make foods levitate. And while many chefs speak of buying new ovens or refrigerators, he wants to invest in a three-dimensional printer to make physical prototypes of his inventions, which he now painstakingly builds by hand. The 3-D printer could function as a cooking device, creating silicone molds for pill-sized dishes flavored, say, like watermelon, bacon and eggs, or even beef Bourguignonne, he said, and he could also make edible molds out of cornstarch.

He also plans to buy a class IV laser to create dishes that are “impossible through conventional means.” (A class IV laser, the highest grade under the Occupational Safety and Health Administration’s classification system, projects high-powered beams and is typically used for surgery or welding.)

Mr. Cantu said he might use the laser to burn a hole through a piece of sashimi tuna, cooking the fish thoroughly inside but leaving its exterior raw. He said he would also use the laser to create “inside out” bread, where the crust is baked inside the loaf and the doughy part is the outer surface. “We’ll be the first restaurant on planet Earth to use a class IV laser to cook food,” he said with a grin.

He is testing a handheld ion-particle gun, which he said is for levitating food. So far he has zapped only salt and sugar but envisions one day making whole meals float before awestruck diners.

The son of a fabricating engineer, Mr. Cantu got his start as a science geek. “From a very young age, I liked to take apart things,” said Mr. Cantu, who grew up in the Pacific Northwest. “All of my Christmas gifts would wind

up in a million pieces. I actually recall taking apart my dad's lawn mower three times to understand how combustible engines work.”

When he was 12, he took a job as a cook and busboy, mainly to earn money for remote-controlled airplanes and helicopters that he then took apart. But the restaurant business rubbed off on Mr. Cantu, and after high school he attended culinary school at Le Cordon Bleu in Portland, Oregon. A series of jobs followed, nearly 50 in all, Mr. Cantu said. He worked as a stagiaire, or intern, in some of the top kitchens around the country, eventually talking his way into a job at Charlie Trotter's, a well-known restaurant in Chicago. He became a sous-chef there before opening Moto last year.

Mr. Cantu has filed applications for patents on more than 30 inventions, including a cooking box that steams fish. The tiny opaque box, about three inches square, is made of a superinsulating polymer. Mr. Cantu heats the box to 350 degrees in an oven and places a raw piece of Pacific sea bass inside it. A server then delivers it to diners, who can watch the fish cook.

Assisting Mr. Cantu with what he calls his “‘Star Wars’ stuff” is DeepLabs, a small Chicago product-development and design consultancy. Mr. Cantu meets weekly with the crew of aerospace and mechanical engineers, programmers, and product designers at DeepLabs for brainstorming sessions.

“I tell them I want to make food float; I want to make it disappear; I want to make it reappear; I want to make the utensils edible; I want to make the plates, the table, the chairs edible,” Mr. Cantu said. “I ask them, what do I need to do that?”

Ryan Alexander, an industrial graphic designer at DeepLabs, said he and his colleagues at the company, which

has designed more conventional products for Motorola and Home Depot, are enthusiastic about Mr. Cantu: “We don’t say no,” he said.

Using engineering, graphics, and animation software, DeepLabs designers have begun to turn Mr. Cantu’s dreams into realities.

They have created mock-ups of his all-in-one utensil, a combination fork, knife, and spoon, as well as utensils with pressurized handles that release aromatic vapors. The latest prototype is a utensil with a disposable, self-heating silicone handle that can be filled with liquefied or pureed foods. A carbon-dioxide-based charge heats the food (soup, for example), and the diner squeezes the handle to release it onto a spoon. Mr. Cantu envisions many applications for such a utensil, from military meals to cookouts.

Mr. Cantu said his experiments and kitchen inventions could one day revolutionize how, where, and what we eat. “This will tap into something,” he said. “Maybe a mission to Mars; I don’t know. Maybe we’re going to find a way to grow something in a temperature that liquid nitrogen operates at. Then we could grow food on Pluto. There are possibilities to this that we can’t fathom yet. And to not do it is far more consequential than just to say, hey, we’re going to stick with our steak and eggs today.”