Recreating Colonial Mexican Fudge: Panochita in the Culinaria Kitchen Laboratory

THE KITCHEN LABORATORY HAS not yet replaced field work and the written archive as sites for Food Studies research, but recreating historical recipes has gained growing recognition for its value in understanding the materiality and taste of foods from the past. Already in the early twentieth century, the Vassar College historian Lucy Maynard Salmon brought cookbooks and kitchen utensils into her seminars—to sneers from her male colleagues. Barbara Ketcham Wheaton (1983) inspired a new generation of researchers with her work on early modern French cookbooks (see also Oliver 2006; Albala 2010). The approach has since found even more ancient applications, for which historical sources are sparse and ambiguous, in reconstructing stews from Babylonian tablets (Barjamovic et al. 2019). Likewise, in our attempt to discover the origins of a colonial Mexican fudge called panochita de leche (this issue), working in the kitchen to learn the physical properties of sugar and milk helped to confirm our initial hypothesis that this recipe was a product of Mexican vernacular traditions of sugar refining and candy making.

Patrick, a physical chemist at Duke University, first got interested in an analogous treat from Québec, sucre à la crème, which he regularly uses in public demonstrations to illustrate how microstructure can dramatically change material properties. In this case, a single step separates the grained confection from soft caramel, resulting in vastly different mouthfeels. Beating the fat-sugar-water mixture as it cools seeds sugar crystals in the former, thus preventing it from turning sticky like the latter. While preparing a chapter for a pedagogical handbook (Altan, Charbonneau, and de Valicourt 2021), Patrick realized that the delicacy had no obvious European antecedents but might have some New World parallels. Were these culinary developments independent?

Having collected a few primary sources, Patrick reached out to Jeffrey, a historian and Food Studies scholar at the University of Toronto, to help situate the project in the context of colonial Mexico. The hypothesis fit nicely with Jeffrey's previous research (Pilcher 1998, 2006, 2012) on the popular origins of Mexican cuisine. Nevertheless, it seemed too pat. There had to be other versions elsewhere during this early modern era of globalization. Consultations with two of the leading scholars on sugar confectionery, Marta Manzanares Mileo at the Universidad Autónoma de Madrid and Ishita Dey at the South Asian University in Delhi,

FIGURE 1: *Kelsey Kilgore, Culinaria Kitchen Manager, stirring panochita de leche.*
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GASTRONOMICA: THE JOURNAL FOR FOOD STUDIES, VOL.23, NO.1, PP.112–115, ISSN 1529-3262. DOI: 10.1525/GFC.2023.23.1.112.

revealed the lack of comparable techniques. Early modern European confectioners candied fruits and nuts and produced egg-based custards and flour-based pastries, but nothing like fudge. In India, by contrast, fudge-like sweets called pedha and burfi were served as temple offerings, but they were prepared with khoa, a slow-cooked, condensed milk, unlike the Mexican panochita, which was boiled to the soft-ball stage and then whisked vigorously as it cooled to induce the distinctive granularity of fudge.

Armed with as many recipes as possible, they went to the Kitchen Laboratory of the Culinaria Research Centre at the University of Toronto Scarborough. Kelsey, the program administrator and kitchen manager, conducted background research to identify and source the materials (Figure 1). Even with just two ingredients, milk and sugar, there were a number of questions about how the material nature of the product would act under laboratory conditions. The fat content of milk determines the way it reacts with sugar and heat, and 3.25% milk is liable to break. Although cream offers more flexibility than milk in cooking time and temperature, Mexican street vendors were unlikely to have produced such an extravagant dish. In the case of sugar, the high acid level of molasses could likewise affect the chemical reactions, and the team experimented with a variety of Latin American brown sugars (Figure 2). Lacking an earthenware cazuela and wood-burning cooktop, the experiments were conducted in stainless-steel pots on an induction burner.

At the lab bench on the day of the trials, Kelsey and Jeffrey began by grinding the sugars into a usable form, measuring out the milk, and setting it to cook. The initial fears about the milk were quickly realized, as it broke apart and took on an unappealing oatmeal-like appearance (Figure 3). Wondering if the milk fat content wasn't high enough, Kelsey added cream in a vain attempt to recover the emulsion. Meanwhile, Jeffrey frantically emailed Patrick: "We've hit a snag. The high proportion of milk to sugar, even with added cream, is making it impossible to reach the ball stage. It's not thickening up at all. Any suggestions?" He later responded: "It just needs to be boiled longer. There's just a lot of water to evaporate before reaching the ball stage. But you will eventually reach it. That's a promise! (If not, there are a lot of physical chemistry textbooks to rewrite . . .)" Patrick was confident for two reasons. First, crystallization of sugar (mostly sucrose) depends on its concentration. Evaporating water may be slow, but it's a sure way to supersaturate sugar, and therefore make the water-sugar solution unstable to nucleation. Second, although milk fat does play a key microstructural role in the grained confection, whether it comes pre-concentrated (cream) or not (milk) is of limited importance. As long as roughly the same quantity is present, the result should have a similarly pleasant mouthfeel.

Despite these theoretical reassurances, the first batch seemed hopeless. Kelsey suggested helpfully: "Let's make ice cream." Kelsey says that often in the kitchen, which is equipped with a Musso ice cream maker. It tasted delicious

FIGURE 2: *Different varieties of brown sugar available from Latinx markets in Toronto.*

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FIGURE 3: *Milk breaking in the pot, taking on an oatmeal-like stage not described in early cookbooks.*

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FIGURE 4: *Panochita de leche (clockwise from top left) made with panela, ground pumpkin seeds, granulated sugar with coconut, and molasses.*

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FIGURE 5: *Using a Kitchen Aid mixer to beat the panochita as it cools into the fudge-like texture, much easier than doing it by hand, especially after stirring for three hours.*

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but didn't help with the experiment at hand. So they started another batch, several more batches actually, using a variety of recipes, and with different types of sugar and mix-ins like pumpkin seed and coconut (Figure 4). In consulting North American recipes from the late nineteenth century, they noticed that the ratio of sugar to milk was much higher, dramatically reducing the long cooking time but at the expense of flavor. Because the Culinaria Kitchen Laboratory is tightly scheduled and time was running out before Kelsey had to prep for the next group, they opted for the convenience of the North American proportions. The results were gratifying, but more research was clearly necessary.

Jeffrey had the opportunity to prepare a second version, this time as part of a Zoom cooking demonstration through the World Historical Association's "Under the Baobab" series in a program called "Dishing About World History: Food and Feasts" (www.thewha.org/conferences/under-the-baobab). He started cooking two hours ahead of the scheduled program, to allow plenty of time to cook the mixture down, adjusting the temperature to show the final mixing, which seemed the most cinematic part of the preparation. Jeffrey succeeded in the timing, bringing the mixture to 235°F just as the talk started, but he didn't anticipate the hard work needed to beat the stiff mixture, especially while trying to maintain his composure for a scholarly presentation. Despite his frantic beating, the mixture had an irregular texture, with a fudgy granularity inside but a thick caramel around the edges. This finding itself nicely showed the importance of skilled and often strenuous labor in the kitchens of the past.

A graduate seminar in the Culinaria Kitchen Laboratory provided the opportunity for one more attempt at the recipe, and the third time was a charm. Jeffrey and Kelsey scheduled plenty of time, and it took the full three hours to cook down the panochita to the proper stage. The Kitchen Aid mixer offered an ideal substitute for the sturdy muscles of colonial-era Mexican cooks (Figure 5). After turning out the panochita to cool, graduate students conducted the essential labor of tasting the final product (Figure 6). They concluded that the lengthy cooking indeed provided a depth of flavor that quick versions lacked.

One final point of reflection regards terminology and what exactly these experiments involved. The act of reproducing historical foods has been variously called reenactment, reverse engineering, recreation, and likely other terms as well. Reenacting, defined by the *Oxford English Dictionary* as "to give a dramatic reproduction of (a past event)," certainly has a pedagogical role in the field of food studies, but it seems less appropriate to this particular research project, even if one iteration was staged on Zoom. Reverse engineering, which examines a product "to determine its construction, composition, or operation, typically with a view to manufacturing a similar product," conveyed an element of the research but was not possible for the lack of a prototype to disassemble. Re-create, meaning "to create again

FIGURE 6: *Lydia Treidlinger, Yianni Pantis, and Lenora Huynh (from left), students in the University of Toronto Graduate Collaborative Specialization in Food Studies, performing the sensory labor of tasting the panochita.*

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or in a new way," best conveys the undertaking because although the outcome did not match colonial Mexican versions, the act of creation provided important insight on the original.

The panochita de leche project drew on three separate scholarly methodologies, Patrick's knowledge of physical chemistry, Jeffrey's textual analysis and Mexican historical context, and Kelsey's practical experience in the culinary arts and food history. Experimental work in the kitchen laboratory helped confirm the hypothesis that panochita's origins lay in the vernacular knowledge of colonial sugar makers in slowly boiling down the cane juice to clarify the impurities of the organic material. Recreating the dish also helped to identify the distinctions between eighteenth-century Mexican recipes and nineteenth-century North American versions, as well as their labor requirements. One final benefit of the experimental research was the ability to taste the dish, not only as a hedonistic exercise but also as an analytical process in Food Studies research.

REFERENCES

Altan, Irem, Patrick Charbonneau, and Justine de Valicourt. 2021. "Sugars: Soft Caramel and Sucre à la crème—an Undergraduate Experiment about Sugar Crystallization." In *Handbook of Molecular Gastronomy*, edited by Róisín M. Burke, Alan L. Kelly, Christophe Lavelle, Hervé This vo Kientza, 545–47. New York: CRC Press.

Albala, Ken. 2010. "Cooking as Research Methodology: Experiments in Renaissance Cuisine." In *Renaissance Food from Rabelais to Shakespeare*, edited by Joan Fitzpatrick, 73–88. Farnham, UK: Ashgate.

Barjamovic, Gojko, Patricia Jurado Gonzalez, Chelsea A. Graham, Agnete W. Lassen, Nawal Nasrallah, and Pia M. Sörensen. 2019. "Food in Ancient Mesopotamia: Cooking the Yale Babylonian Culinary Recipes." In *Ancient Mesopotamia Speaks: Highlights from the Yale Babylonian Collection*, edited by Agnete Lassen, Eckart Frahm and Klaus Wagensonner, 108–25. New Haven, CT: Yale Peabody Museum of Natural History.

Oliver, Sandra. 2006. "Ruminations on the State of American Food History." *Gastronomica* 6.4: 91–98.

Pilcher, Jeffrey M. 2012. *Planet Taco: A Global History of Mexican Food*. New York & Oxford: Oxford University Press.

_____. 2006. *The Sausage Rebellion: Public Health, Private Enterprise, and Meat in Mexico City, 1890–1917*. Albuquerque: University of New Mexico Press.

_____. 1998. *¡Que vivan los tamales! Food and the Making of Mexican Identity*. Albuquerque: University of New Mexico Press.

Wheaton, Barbara Ketcham. 1983. *Savoring the Past: The French Kitchen and Table from 1300 to 1789*. Philadelphia: University of Pennsylvania Press.