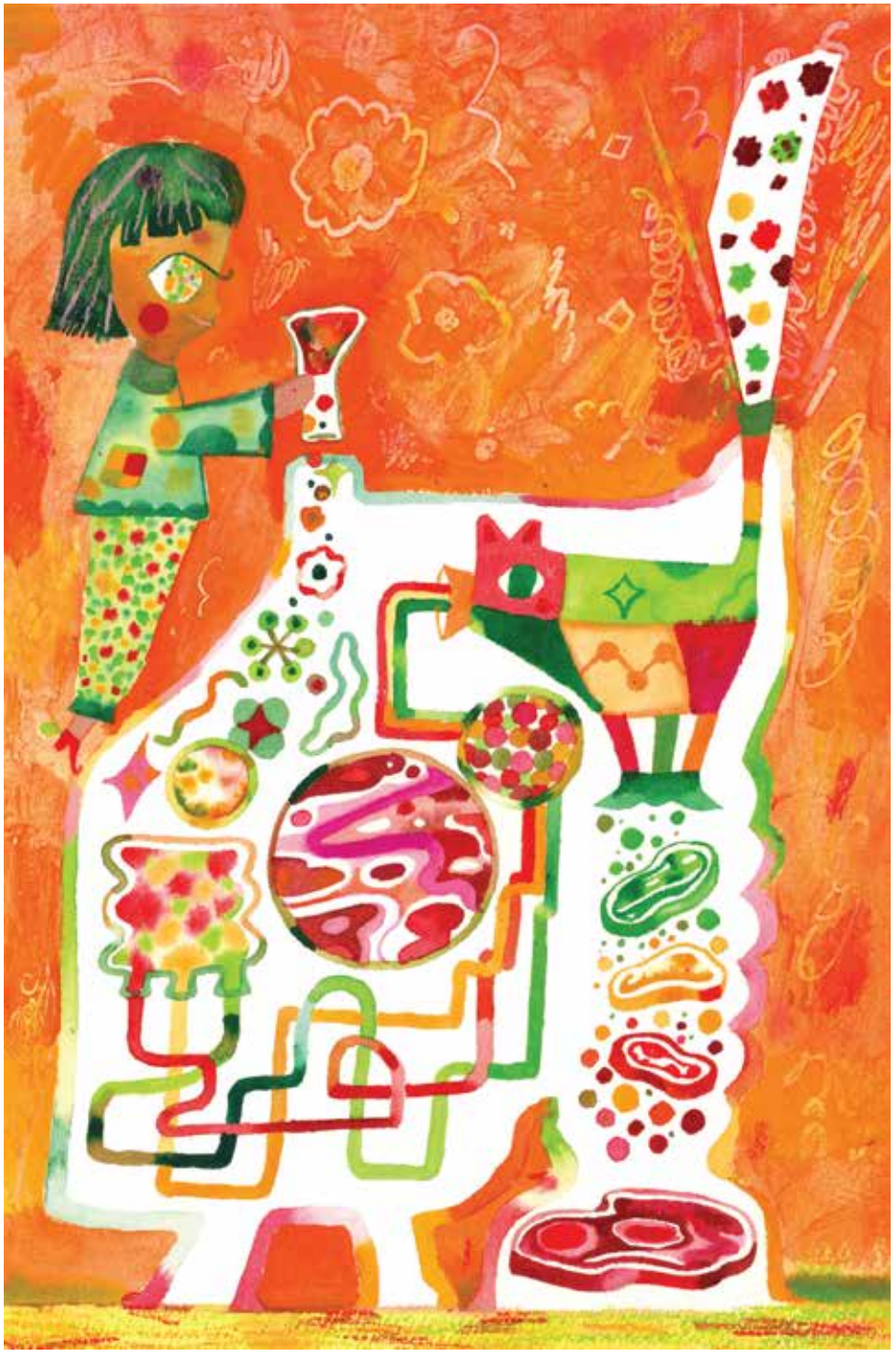

Illustrations by Haejin Park

BIOREACTOR TO TABLE

Can barbecue culture come to terms with cultured meat?

BY STEVE HARUCH

If you've ever sat in a barbecue restaurant and wondered how many flesh-and-blood animals it takes to supply the meat for all those shoulder sandwiches, smoked chicken quarters, and half-racks of ribs, you're not alone. A new wave of companies is betting that in the not-too-distant future, the answer might approach zero. So-called "clean meat," or meat that is grown in a laboratory from stem cells under controlled conditions, forgoes the live animal altogether.

In his book *Clean Meat: How Growing Meat Without Animals Will Revolutionize Dinner and the World*, Paul Shapiro explains, "Using technology first developed by academics and the medical field and now being commercialized by several start-ups, innovators are taking tiny biopsies of animals' muscles and then culturing those cells to grow more muscle outside the animals' bodies." The reasons for pursuing this method anticipate a near-certain imbalance of supply and demand: growing demand for meat by an increasing human population is unsustainable.

Certainly, the labs currently working on this technology will need to scale up to industrial bioreactors at some point, in order to brew anything approaching current production. In his book *The One True Barbecue: Fire, Smoke, and the Pitmasters Who Cook the Whole Hog*, Rien Fertel describes a hog slaughtering and processing plant in Tar Heel, North Carolina, where "2,500 Smithfield employees arrive in two rotating shifts to kill, prep, pack, and ship more than 30,000 hogs each day." That's a lot of pigs.

It's also a lot of water, a lot of land, and a lot of pollution. For the United States market, roughly 9 billion animals are raised and slaughtered for their meat each year. On a warming, crowded planet, livestock production accounts for more greenhouse gases than all modes of transportation combined. What if it didn't have to be this way?

In 2016, a company called Memphis Meats produced its first meatball, using beef cultured from cow cells, including those for muscle and connective tissue. CEO and co-founder Uma Valeti, who hadn't eaten meat in years due to his discomfort with how it's produced, declared the meatball a success. He later told *Inc.* magazine that it "just immediately brought back all the memories you get when you eat meat."

The cost of that lab-grown meat at the time was a daunting $18,000 per pound. More recently, Memphis Meats offered up two poultry creations: a "Southern Fried Chicken"—with a candy-orange swirl of sauce and a cilantro sprig that belied its non-Southern origins; and duck à l'orange. With the chicken coming in at $9,000 per pound, price is clearly still

a barrier. But the company reportedly hopes to have their products on store shelves by 2021.

Despite the moniker, Memphis Meats is based not in Shelby County, Tennessee, but in Silicon Valley. "We love the meat-loving culture of Memphis; it's an iconic place," Valeti told the *Commercial Appeal* in 2016. "There's an association with good meat."

Their actual association with Bluff City appears to continue in name only: Co-founder Will Clem—a tissue scientist and owner of Baby Jacks BBQ, which for a time dedicated blank menu space to possible future clean meat dishes—no longer appears on the company's website. Similarly, a reference to having "one foot in San Francisco and the other in Memphis, Tennessee" has been removed from the "Our Story" page—though it does still mention "combining the innovative spirit of Silicon Valley and the rich food traditions of the American south [sic]." (Memphis Meats declined multiple interview requests for this article, and a company representative did not respond to a list of questions sent via email.)

With significant progress already under their belts and a recent $17 million fundraising round, they are widely considered to be the company best positioned to bring lab-grown meat to the consumer market. They count Bill Gates and Richard Branson among their financial backers. In January, the venture capital arm of Arkansas-based Tyson Foods invested, joining fellow agribusiness giant Cargill.

Valeti likens the promise of lab-grown meat to "the second domestication." Whereas humans first took control of animals to harvest their flesh, now we can directly harvest the cells themselves. The Memphis Meats team tends to use the term "cultured meat" a lot, and those in the business also speak of "brewing" meat—in a 2016 story in the *Memphis Flyer*, Clem compared the process to craft beer.

JAMES PEISKER AND Chris Carter started Porter Road Butcher as a pop-up farmers market stall, and have since expanded to their own East Nashville shop and an online mail-order business. As you might imagine, they are skeptical of Memphis Meats and their ilk.

"I don't necessarily think it's the right move," Peisker says of lab-grown meat. Though he calls the intent "noble," he says that for him, lab meat fundamentally addresses the wrong problem. "The way that we as humans need to think about meat," he says, "is consuming it in a much more responsible manner—the way it's raised, the way we harvest it—and eat a higher quality, and less of it."

But as Paul Shapiro notes in *Clean Meat*, we've known for decades that "the Earth isn't big enough to sustain a global population of American-style meat-eaters." Even so, vegetarianism has held steady around 2-5 percent of the population, and ethical arguments for reducing meat consumption have historically failed. For his part, Peisker—a butcher advocating for reduced meat consumption—offers a socio-economic argument.

"Meat is incorrectly priced, and it is getting paid for by the low wages of the people, by the misery of the animals," Peisker says. In effect, he argues that the ugliness of the system alone should be enough for consumers to demand a change. "And if lab-creating meat is the only way we can feed our need for inexpensive unhappy meat," he adds, "we need to look at ourselves as a society."

Lab-grown meat would solve the unhappiness of livestock by removing animals from the picture altogether. (Once their cells are gathered, that is.) To Peisker's other point—that the low prices of commodity meat are borne on the backs of people earning very little—*Texas Monthly* barbecue editor Daniel Vaughn adds that working conditions will be an important point of distinction between new lab-meat companies and the industry they seek to replace. "They really need to look at the way they treat their workers," Vaughn says. "They need to focus big-time on that."

The view from Porter Road is that lab-grown meat also has serious gustatory shortcomings. "You can recreate actual tissue of animals in a lab," Peisker says. "But...what develops flavor in muscle protein is the action of that muscle working."

There appears to be a similar principle at work in cultured meats. "Valeti and Genovese noticed that if they harvested the meat earlier in the growing process, the flesh was more tender, similar to when taken from a younger animal like a calf or lamb," Shapiro notes in *Clean Meat*. "If they waited a little longer, it was more texturized, like that of an older animal." Longer, in this case, is a matter of days or weeks. That's unlikely to satisfy the Porter Road butchers.

Oddly enough, the lab-grown muscles *do* work—or at least they twitch. When they reach a certain stage of maturity, the disembodied fibers begin to spontaneously contract.

ONE ADVANTAGE lab-grown meat has over plant-based alternatives, according to Valeti, is that they don't require a change in mindset. "People can buy it off the shelf, take it home, and cook it in the ways they've known for centuries," he has said.

But will people really eat it? A poll conducted by Pew Charitable Trusts in 2014 found that only 20 percent of Americans were willing to eat "meat that was grown in a lab." (A separate study of Belgian consumers found somewhat

better results if the question was framed with environmental benefits.)

Rodney Scott, proprietor and pitmaster at his eponymous restaurant in Charleston, South Carolina, is known for his slow-cooked, whole-hog barbecue, and for sourcing and splitting his own wood. His motto, "cut, chop, cook," speaks to a work ethic that accepts no shortcuts.

When I call him and pose the question of cooking with lab-grown meat, he's at a loss for words at first.

"Wow," he replies. Then a long silence.

"In my honest opinion, I wouldn't," he says. "I don't think my customers would understand it, either."

Scott admits part of this reaction comes from being set in his ways. "For us old-school country boys," he says, "that whole hog sums it all up." Hearing him describe the way the juices from the back bone, along with the different flavors from the ribs, hams, and belly, all come together over the course of twelve hours above smoldering wood coals, it's hard to imagine anyone choosing a cultured meat product over *that*.

Vaughn is less skeptical. Once a few high-profile chefs put it on their menus and their Instagram feeds, he reasons, the public will follow suit. "I think all these people who say they wouldn't eat it, they just haven't seen anyone else eat it," he says. But, he adds: "Any of the barbecue hardcore folks out there, you're never going to win them over." Anyone who would decry prime grade brisket, he reasons, will reject lab-grown anything.

There's also the question of whether lab-grown meat can ever really serve more than a niche market. As Vaughn puts it: "If we were having this discussion about kobe beef—all this meat is going to be expensive for a good long while, I imagine—if we're talking about it in those terms, nobody's saying, 'Yeah, but what about that guy in the shack who's cooking barbecue?'"

The whole idea of Southern barbecue, he says, is "taking these cheaper cuts, and through long, low cooking times, you can transform them into something entirely different. If you're designing a cut of meat, why would you ever design it to be that difficult to cook?"

But this is about more than marbling. With global population heading toward 9 billion and beyond, and demand for meat expected to double in coming decades, the math says that eventually even the pitmaster will feel the effects, one way or another. So it's easy to agree, at least in principle, with Memphis Meats' basic position that "we need a better way to feed a hungry world."

There are as many questions as answers. Could this new generation of companies one day supply racks of lab-grown ribs? Or does it defeat the conservationist purpose to create waste material like bone? What about growing the never-alive body of an entire pig? It's at least theoretically possible—but is the idea of brewing entire carcasses from stem cells just too freaky?

"Very freaky," Scott offers. Another long silence.

But the longer we talk, the more he comes around to the idea. "If that ever came about, I would love to try it," he finally says. And if Scott's manning the pits that day, he'll draw a crowd.

Steve Haruch is a writer and independent filmmaker based in Nashville. He is the editor of People Only Die of Love in Movies: Film Writing by Jim Ridley, *out in June from Vanderbilt University Press.*

NATIVE STRANGERS OF THE SOUTH

Illustrations by Ginnie Hsu

CONSTRUCTING IDENTITY ON THE PAGE AND THE PLATE

BY NABEN RUTHNUM