TASTE TECHNOLOGIES

THE KETCHUP CONUNDRUM

Mustard now comes in dozens of varieties. Why is ketchup still the same?

BY MALCOLM GLADWELL

Ketchup triggers, in equal measure, all five of the fundamental tastes; one food theorist calls it "the esperanto of cuisine."
Many years ago, one mustard dominated the supermarket shelves. French's. It came in a plastic bottle. People used it on hot dogs and bologna. It was a yellow mustard, made from ground white mustard seed with tur- meric and vinegar, which gave it a mild, slightly metallic taste. If you looked hard in the grocery store, you might find something in the specialty-foods section called Grey Poupon, which was Dijon mustard, made from the more pest- gent brown mustard seed. In the early seventies, Grey Poupon was no more than a hundred-thousand-dollar-a-year business. Few people knew what it was or how it tasted, or had any particular desire for an alternative to French's or the runner-up, Gulden's. Then one day the Heublin Company, which owned Grey Poupon, discovered something remarkable: if you gave people a muss- tard taste test, a significant number had only to try Grey Poupon once to switch from yellow mustard. In the food world that almost never happens, even among the most successful food brands, only about one in a hundred have that kind of conversion rate. Grey Poupon was magic.

So Heublin put Grey Poupon in a bigger glass jar, with an enamelled label and a Deauville flair of a whiff of Frenchness, and began to market it as if it were still being made in Europe. (It was made in Hartford, Connecticut, from Canadian mustard seed and white wine.) The company ran tasteful print ads in up- scale food magazines. They put the mustard in little foil packets and dis- tributed them with airplane meals— which was a brand-new idea at the time. Then they hired the Manhattan ad agency Lowe Marschall to do something, on a modest budget, for tele- vision. The agency came back with an idea: A Rolls-Royce is driving down a country road. There's a man in the back seat in a suit with a plate of beef on a silver tray. He nods to the chauffeur, who opens the glove compartment. Then comes what is known in the business as the "reveal." The chauffeur hands back a jar of Grey Poupon. An- other Rolls-Royce pulls up alongside. A man leans his head out the window. "Pardon me. Would you have any Grey Poupon?"

In the cities where the ads ran, sales of Grey Poupon leaped forty to fifty per cent, and whenever Heublin bought airtime in new cities sales jumped by forty to fifty per cent again. Grocery stores put Grey Poupon next to French's and Gulden's. By the end of the nineteen- seventies Grey Poupon was the most powerful brand in mustard. "The tagline in the commercial was that this was one of life's finer pleasures," Larry Elegant, who wrote the original Grey Poupon spot, says, "and that, along with the Rolls-Royce, seemed to impart to peo- ple's minds that this was something truly different and superior."

The rise of Grey Poupon proved that the American supermarket shop- per was willing to pay more—in this case, $3.99 instead of $1.49 for eight ounces—as long as what they were buying carried with it an air of sophistication and complex aromatics. Its success showed, furthermore, that the bound- aries of taste and custom were not fixed: that just because mustard had always been yellow didn't mean that consum- ers would use only yellow mustard. It is because of Grey Poupon that the stan- dard American supermarket today has an entire mustard section. And it is because of Grey Poupon that a man named Jim Wigon decided, four years ago, to enter the ketchup business. Just as the mustard brand was established, so he wanted to create the Grey Poupon of ketchup.

Wigon is from Boston. He's a thick- set man in his early fifties, with a full salt-and-paper beard. He runs his ketchup business—under the brand World's Best Ketchup—out of the ca- tering business of his partner, Nick Scharitzin, in Norwood, Massachusetts, just off Route 1, in a low-shingled building behind an industrial-equipment-rental shop. He starts with red peppers, Spanish onions, garlic, and a high-end tomato paste. Basil is chopped by hand, because the buffalo chopper bruises the leaves. He uses maple syrup, not corn syrup, which gives him a quarter of the sugar of Heinz. He pours his ketchup into a clear glass ten-ounce jar, and sells it for three times the price of Heinz, and for the past few years he has criss- crossed the country, peddling World's Best in six flavors—regular, sweet, dill, garlic, caramelized onion, and basil—to specialty grocery stores and supermar- kets. If you were in Zabar's on Man- hattan's Upper West Side a few months ago, you would have seen him at the Point of Sale, mop-top gray, eyes shining in the subi and the gefilte fish. He was wearing a World's Best baseball cap, a white shirt, and a red-stained apron. In front of him, on a small table, was a silver tureen filled with miniatures chicken and beef meatballs, a box of toothpicks, and a dozen or so open jars of his ketchup. "Try my ketchup!" Wigon said, over and over, to anyone who passed. "If you don't try it, you're damned to eat Heinz the rest of your life."

In the same aisle at Zabar's that day two other demonstrations were going on, so that people were starting at one end with free chicken sausage, sampling a slice of prosciutto, and then pausing at the World's Best stand before head- ing for the cash register. They would look down at the array of open jars, and Wigon would impale a meatball on a toothpick, dip it in one of his ketch- ups, and hand it to them with a flourish. The ratio of tomato solids to liquid in World's Best is much higher than in Heinz, and one could almost say it is an unmistakable sweet kick. Inevitably, people would close their eyes, just for a moment, and do a subtle double take. Some of them would look slightly perplexed and walk away, and others would nod and pick up a jar. "You know why you like it so much?" he would say, in his broad Boston accent, to the customers who seemed most im- pressed. "Because you've been eating bad ketchup all your life!" Jim Wigon had a simple vision: build a better ketchup—the way Grey Poupon built a better mustard—and the world would bear a passing resemblance. Maybe it was that easy.

The story of World's Best Ketchup cannot properly be told without a man from White Plains, New York, named Howard Moskowitz. Mos- kowitz is sixty, short and round, with graying hair and huge gold-rimmed glasses. When he talks, he favors the Socratic monologue—a series of ques- tions that he poses to himself, then
answers, punctuated by "ahhh" and much vigorous nodding. He is a fixed descendant of the legendary eighteenth-century Haustic rabbi known as the Seer of Lublin. He keeps a parrot. At Harvard, he wrote his doctoral disserta-
tion on psychophysics, and all the rooms on the ground floor of his food-
testing and market-research business are named after famous psychophysi-
cists. (Here you stand in front of the name Rose Marie Pang-
born! Ahhh. She was a pro-
fessor at Davis. Very famous. This is the "Perkman kitchen.""

Moskowitz is a man of un-
common existence and per-
aversiveness: if he had been your
freshman statistics professor,
you would today be a statisti-
cian. "My favorite writer? Gibbon," he 
burbled, as we met not long ago.
He had just been holding forth on the
subject of solid solutions. "Right now
I'm working my way through the Hales
history of the Byzantine Empire. Holy
shit! Everything is easy until you get
to the Byzantine Empire. It's impossible.
One emperor is always killing the
other, and everyone has five wives or three
husbands. It's very Byzantine."

Moskowitz set up shop in the se-
eries, and one of his first clients was
Pepsi. The artificial sweetener asa-
tane had just become available, and
Pepsi wanted Moskowitz to figure out
the perfect amount of sweetener for a
can of Diet Pepsi. Pepsi knew that any-
things below eight percent sweetness
was not sweet enough and anything
twelve percent was too sweet. So
Moskowitz did the logical thing.
He made up experimental batches of Diet
Pepsi with every conceivable degree of
sweetness—8 per cent, 8.25 per
cent, 8.5, and on and up to 12—gave
them to hundreds of people, and looked
for the concentration that people liked
the most. But the data were a mess—
there wasn't a pattern—and one day,
sitting in a diner, Moskowitz realized
why. They had been asking the wrong
question. There was no such thing as
the perfect Diet Pepsi. They should
have been looking for the perfect Diet
Pepsi.

It took a long time for the food
world to catch up with Howard Mos-
kowitz. He knocked on doors and tried
to explain his idea about the plural
nature of perfection, and no one an-
swered. He spoke at food-industry con-
ferences, and audiences shrugged. But
he could think of nothing else. It's
like that Yiddish expression," he says,
"Do you know it? To a worm in horse-
radish, the world is horseradish." Thus,
in 1986, he got a call from the Camp-
bell's Soup Company. They were in the
spaghetti-sauce business, and they were
up against Ragú with their Prego brand.
Prego was a little thicker than Ragú, with
diced tomatoes as opposed to Ragú's
paste, and Campbell's thought, had better pasta adherence.
But, for all that, Prego was in a
slump, and Campbell's was des-
perately for new ideas.

Standard practice in the food indus-
try would have been to convene a focus
group and ask spaghetti eaters what
they wanted. But Moskowitz does not
believe that consumers—even spaghetti
lovers—know what they desire if what
they desire does not yet exist. "The
mind," as Moskowitz is fond of saying,
"knows not what the tongue wants."
Instead, working with the Campbell's
kitchens, he came up with forty-five
varieties of spaghetti sauce. These
were designed to differ in every conceivable way:
spiciness, sweetness, tartness,
saltiness, thickness, aroma, mouth feel,
price of ingredients, and so forth. He
had a trained panel of food testers anal-
lyze each of those varieties in depth.
Then he took the prototypes on the
toad—to New York, Chicago, Las An-
gles, and Jacksonville—and asked peo-
ple in groups of twenty-five to eat be-
tween eight and ten small bowls of
different spaghetti sauces over two
hours and rate them on a scale of one
to a hundred. When Moskowitz shut-
ted the results, he saw that everyone had
a slightly different definition of what
a perfect spaghetti sauce tasted like.
If you sifted carefully through the
data, though, you could find patterns,
and Moskowitz learned that most peo-
ple's preferences fell into one of three
groups: plain, spicy, and extra-
chunky; and of those three the last was
the most important. Why? Because at
the time there was no extra-chunky
spaghetti sauce in the supermarket.
Over the next decade, that new cate-
gory proved to be worth hundreds of
millions of dollars to Prego. "We
all said, 'Wow!'" Monica Wood, who was
then the head of market research for
Campbell's, recalls. "Here there was this
third segment—people who liked their
spaghetti sauce with lots of stuff in it—
and it was completely untested. So in
about 1989-90 we launched Prego extra-chunky. It was extraordinarily
successful.

It may be hard today, fifteen years
later—when every brand seems to come
in multiple varieties—to appreciate how
much of a breakthrough this was. To
those years, people in the food industry
carried around in their heads the notion
of a platonic dish—the version of a dish
that looked and tasted absolutely right.
At Ragú and Prego, they had been striv-
ing for the platonic spaghetti sauce, and
the platonic spaghetti sauce was thin
and bland because that's the way they
thought it was done in Italy. Cooking,
on the industrial level, was consumed
with the search for human universals.
Once you start looking for the sources
of human variability, though, the old or-
thodoxy goes out the window. Howard
Moskowitz stood up to the Platonicists
and said there are no universals.

Moskowitz still has a version of the
computer model he used for Prego fif-
teen years ago. It has all the coded results
from the consumer taste tests and the
expert tastings, split into the four cate-
gories (plain, spicy, extra-chunky), and
linked up with the actual ingredients
list on a spreadsheet. 'You know how
they have a computer model for build-
ing an aircraft,' Moskowitz said as
he pulled up the program on his com-
puter. "This is a model for building
spaghetti sauce. Look, every variable is
here." He pointed at columns after col-
umn of ratings. 'So here are the ingredi-
ants. I'm a brand manager for Prego. I
want to optimize one of the seg-
ments. Let's start with Segment 1.' In
Moskowitz's program, the three
spaghetti-sauce groups were labelled
Segment 1, Segment 2, and Segment 3.
He typed in a few commands, in-
structing the computer to give him
the formulation that would score the
highest with those people in Segment 1.
The answer appeared almost im-
mediately—a secret recipe that, accord-
ing to Moskowitz's data, produced a
score of 78 from the people in Segment 1. But that same formulation didn’t do nearly as well with those in Segment 2 and Segment 3. They scored it 67 and 57, respectively. Moskowitz started again, this time asking the computer to optimize for Segment 2. This time the ratings came in at 82, but now Segment 1 had fallen ten points, to 68. “See what happens?” he said. “If I make one group happier, I piss off another group. We did this for coffee with General Foods, and we found that if you create only one product the best you can get across all the segments is a 60—if you’re lucky. That’s if you were to treat everybody as one big happy family. But if I do the sensory segmentation, I can get 70, 71, 72. Is that big? Ahh. It’s a very big difference. In coffee, a 71 is something you’d die for.”

When Jim Wiggon set up shop that day at Zabar’s, then, his operating assumption was that there ought to be some segment of the population that preferred a ketchup made with Stanis-laus tomato paste and hand-chopped basil and maple syrup. That’s the Moskowitz theory. But there is theory and there is practice. By the end of that long day, Wiggon had sold ninety jars. But he’d also got two parking tickets and had to pay for a hotel room, so he wasn’t going home with money in his pocket. For the year, Wiggon estimates, he’ll sell fifty thousand jars—which, in the universe of condiments, is no more than a blip. “I haven’t drawn a paycheck in five years,” Wiggon said as he imitated another meatball on a toothpick. “My wife is killing me.” And it isn’t just World’s Best that is struggling. In the gourmet-ketchup world, there is River Run and Uncle Dave’s, from Vermont, and Muir Glen Organic and Mrs. Tomato Head Roasted Garlic Peppers in California, and dozens of others—and every year Heinz’s overwhelming share of the ketchup market just grows.

It is possible, of course, that ketchup is waiting for its own version of that Rolls-Royce commercial, or the discovery of the ketchup equivalent of extra-chunky—the magic formula that will satisfy an unmet need. It is also possible, however, that the rules of Howard Moskowitz, which apply to Grey Poupon and Prego spaghetti sauce and to olive oil and salad dressing and virtually everything else in the supermarket, don’t apply to ketchup.

Tomato ketchup is a nineteenth-century creation—the union of the English tradition of fruit and vegetable sauces and the growing American infatuation with the tomato. But what we know today as ketchup emerged out of a debate that raged in the first years of the last century over benzoate, a preservative widely used in late-nineteenth-century condiments. Harvey Washington Wiley, the chief of the Bureau of Chemistry in the Department of Agriculture from 1883 to 1912, campaigned to believe that benzoates were not safe, and the result was an argument that split the
ketchup world in half. On one side was the ketchup establishment, which believed that it was impossible to make ketchup without benzene and that benzene was not harmful in the amounts used. On the other side was a renegade band of ketchup manufacturers, who believed that the preservative was harmful. The battle raged on with the application of culinary science. The dominant nineteenth-century ketchups were thin and watery, in part because they were made from unripe tomatoes, which were low in the complex carbohydrates known as pectin, which add body to a sauce. But what if you made ketchup from ripe tomatoes, giving it the density it needed to resist degradation? Nineteenth-century ketchups had a strong tomato taste, with just a light vinegary touch. The renegades argued that by greatly increasing the amount of vinegar, in effect protecting the tomatoes by pickling them, they were making a superior ketchup: safer, purer, and better tasting. They offered a money-back guarantee in the event of spoilage. They charged more for their product, convinced that the public would pay more for a better ketchup, and they were right. The benzene ketchups disappeared. The leader of the renegade band was an entrepreneur out of Pittsburgh named Henry J. Heinz.

The world's leading expert on ketchup's early years is Andrew P. Smith, a substantial man, well over six feet, with a graying mustache and short wavy black hair. Smith is a scholar, trained as a political scientist, intent on bringing rigor to the world of food. When we meet for lunch not long ago at the restaurant Savoy in Soho (chosen because of the excellence of its hamburgers and French fries, and because Savoy makes its own ketchup—a dark, peppery, and viscous variety served in a white porcelain sauceboat), Smith was in the throes of examining the origins of the croissant for the upcoming "Oxford Encyclopedia of Food and Drink in America," of which he is the editor-in-chief. Was the croissant invented in 1863, by the Viennese, in celebration of their defeat of the invading Turks? Or in 1681, by the residents of Budapest, to celebrate their defeat of the Turks? Both explanations would explain its distinctive crescent shape—since it would make a certain cultural sense (particularly for the Viennese) to commemorate their battlefield triumphs in the form of pastry. But the only reference Smith could find to either story was in the Larousse Gastronomique of 1918. "It just doesn't check out," he said, shaking his head wearily.

Smith's specialty is the tomato, howe- ever, and over the course of many scholarly articles and books—"The History of Home-Made Anglo-American Tomato Ketchup," for Better Propag Cal- culator, for example, and "The Great Tomato Pill War of the 1830s," for The Connecticut Historical Society Bulletin—Smith has argued that some critical portion of the history of culinary civilization could be told through this fruit. Cervantes brought tomatoes to Europe from the New World, and they inexorably immor- talized themselves into the world's cuisines. The Italians substituted the tomato for eggplant. In northern India, it went into curries and chutneys. "The biggest tomato pool ever in the world today," Smith pressed, for dramatic effect. "Choose. You don't think of tomato being a part of Chinese cuisine, and it wasn't ten years ago. But it is now." Smith dipped one of my French fries into the homemade sauce. "It has the right taste," he said, with a look of intense concentration. "It's fresh ketchup. You can taste the tomato." Ketchup was, to his mind, the most nearly perfect of all the tomato's manifestations. It was inexp- lansible, which meant that it had a firm back on the mass market, and it was a condiment, not an ingredient, which meant that it could be applied at the discretion of the food eater, not the food preparer. "There's a quote from Elizabeth Bowen: I've always loved," he said. "Rotin is the food theorist who wrote the essay "Ketchup and the Col- lective Unconscious," and Smith used her conclusion as the epigraph of his ketchup book; ketchup may well be "the only true culinary expression of the melting pot, and... its special and un- pretentious ability to provide some- thing for everyone makes it the Ex- periment of cuisine." Here is where Heinz and the benzene battle were so important: in defeating the condiment Old Guard, he was the one who changed the flavor of ketchup in a way that made it universal.

There are five known fundamental tastes in the human palate: salty, sweet, sour, bitter, and umami. Umami is the proteinaceous, full-bodied taste of chicken soup, or cured meat, or fish stock, or aged cheese, or mother's milk, or soy sauce, or mushrooms, or sea- weed, or cooked tomato. "Umami adds body," Erwin Breidenthal, who heads the Monell Chemical Senses Center, in Philadelphia, says. "If you add it to a soup, it makes the soup seem like it's thicker—it gives it sensory heft. It turns a soup from salt water into a food." When Heinz moved to ripe tomatoes and increased the percentage of tomato solids, he made ketchup, first and foremost, a potent source of umami. Then he dramatically increased the concentra- tion of sugar, so now ketchup was sweet—and all along ketchup had been salty and bitter. These are not trivial issues. Give a baby soup, and then soup with MSG (an amino-acid salt that is pure umami), and the baby will go back for the MSG every time, the same way a baby will always prefer water with sugar to water alone. Salt and sugar and umami are primal signals about the food we are eating—about how dense it is in calories, for example, or, in the case of umami, about the presence of proteins and amino acids. What Heinz had done was come up with a condiment that pushed all five of these primal buttons. The taste of Heinz' ketchup began at the tip of the tongue, where our recep- tors for sweet and salty first appear, moving along the sides, where sour notes seem to strengthen, then hit the back of the tongue, for umami and bitter, in one long crescendo. How many things in the supermarket run the sensory spectrum like this?

A number of years ago, the H. J. Heinz Company did an extensive market- research project in which researchers went into people's homes and watched the way they used ketchup. "I remem-
The machine's done something really weird to Mr. Hendrickson.
ments of an iconic, high-amplitude flavor like Coca-Cola or Pepsi. But you can with one of those private-label colas that you get in the supermarket.

"The thing about Coke and Pepsi is that they are absolutely gorgeous," Judy Heylman, a vice-president of Sensory Spectrum, Inc., in Chatham, New Jersey, says. "They have beautiful notes—t all flavors are in balance. It's very hard to do that well. Usually when you taste a store cola it's—and here she made a series of péépéépéé sounds—all the notes are kind of spiky, and usually the citrus is the first thing to strike out. And then the cinnamon. Citrus and brown spice notes are top notes and very volatile, as opposed to vanilla, which is very dark and deep. A really cheap store brand will have a big, fat cinnamon note sitting on top of everything."

Some of the cheaper ketchups are the same way. Ketchup aficionados say that there's a disguising sweetness to the tomato notes in Del Monte ketchup. Tomatoes vary in acidity and sweetness and the ratio of solids to liquid, according to the seed variety used, the time of year they are harvested, the soil in which they are grown, and the weather during the growing season. Unless all those variables are tightly controlled, one batch of ketchup can end up too watery and another can be too strong. Or try one of the numerous private-label brands that make up the bottom of the ketchup market and put attention to the spice mix; you may well find yourself conscious of the clove note or overwhelmed by a hit of garlic. Generic coke and ketchups have what Moskowitz calls a hook—a sensory attribute that you can single out and ultimately tire of.

The tasting began with a plastic spoon. Upon consideration, it was decided that the analysis would be helped if the ketchups were tasted on French fries, so a batch of fries were cooked up, and distributed around the table. Each taster, according to protocol, took the fries one by one, dipped them into the cup—all the way up to the bottom—but off the portion covered in ketchup, and then contemplated the evidence of their senses. For Heinz, the critical flavor component is vinegar, salt, tomato I.D. (over-all tomato-ness), sweet, and bitter—were judged to be present in roughly equal concentrations; and those elements, in turn, were judged to be well-blended. The World's Best, though, "had a completely different view, a different profile, from the Heinz," Chambers said. It had a much stronger hit of sweet aromatics—4,0 to 2.5—and outstripped Heinz on tomato I.D. by a resounding 9 to 5.7. But there was less salt, and no discernible vinegar. "The other component from the panel was that these elements were really not blended at all," Chambers went on. "The World's Best product had really low amplitude." According to Joyce Buchholz, one of the panelists, when the group judged afterward, "it seemed like a certain flavor would hang over longer in the case of World's Best—that cooked-tomatoey flavor."

But what was Jim Wigon to do? To compete against Heinz, he had to try something dramatic, like substituting maple syrup for corn syrup, ramping up the tomato solids. That made for an unusual and daring flavor. World's Best Dill ketchup on fried catfish, for instance, is a marvelous thing. But it also meant that his ketchup wasn't as sensorily complete as Heinz, and he was paying a heavy price in amplitude. "Our conclusion was mainly this," Buchholz said. "We felt that World's Best seemed to be more like a sauce." She was trying to be helpful.

There is an exception, then, to the Moskowitz rule. Today there are thirty-six varieties of Ragú spaghetti sauce, under six rubrics—Old World Style, Chunky Garden Style, Robusto, Light, Cheese Creations, and Rich & Minny—which means that there is very nearly an optimal spaghetti sauce for every man, woman, and child in America. Measured against the monosomy that confronted Howard Moskowitz twenty years ago, this is progress. Happiness, in one sense, is a function of how closely our world conforms to the infinite variety of human preference. But that makes it easy to forget that sometimes happiness can be found in having what we've always had and everyone else is having. "Back in the seventies, someone else—I think it was Ragú—tried to do an Italian-style ketchup." Moskowitz said. "They failed miserably. It was a conundrum: what was true about a yellow condiment that went on hot dogs was not true about a tomato condiment that went on hamburgers, and what was true about tomato sauce when you added visible solids and put it in a jar was somehow not true about tomato sauce when you added vinegar and sugar and put it in a bottle. Moskowitz shrugged. "I guess ketchup is ketchup."