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what makes us
EAT
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labels



what makes us EAT too much

BY BONNIE LIEBMAN

A Manhattan Project

“What we want to know when we talk about why we get fat is: do [people] get fat because they take in more energy than they expend—because they overeat, because they’re sedentary?” asks Gary Taubes, author of *Why We Get Fat* and *The Case Against Sugar*.

“Or is there something happening hormonally in their bodies that’s driving them to accumulate excess fat?”

That was Taubes, in a video on the Nutrition Science Initiative (NuSI) website.

In 2012, *Forbes* called NuSI “a Manhattan Project to end the obesity epidemic.” Co-founded by Taubes, NuSI was largely financed by billionaire former hedge fund manager John Arnold and his wife, Laura.

“Our goal: Conclusive evidence in the next decade,” says NuSI’s website. Now, some of NuSI’s evidence is starting to roll in.

Is a Calorie a Calorie?

Are all calories equal? Or is the body more likely to store—rather than burn—a calorie of carbs than a calorie of fat?

That was the first question tackled by NuSI’s Energy Balance Consortium of 10 obesity experts.

The accepted explanation for weight gain “is that you become fat because you’re eating more calories than you are burning, and therefore you store the excess as body fat,” explains Kevin Hall, senior investigator at the National Institute of Diabetes and Digestive and Kidney Diseases.

Hall led two studies designed to answer Taubes’ question: Do carbs drive

Two out of three American adults—and one out of three children and teens—are overweight or obese. And it’s not just here.

“Since 1980, WHO estimates that the worldwide prevalence of obesity has more than doubled,” [noted](#) Margaret Chan, Director-General of the World Health Organization, in October. “This shift to population-wide obesity is occurring with terrifying speed.”

What’s driving the obesity epidemic? Here’s the latest evidence.

you to gain more body fat because they boost levels of the hormone insulin?

“The argument is that people are consuming too many carbohydrates, which drive up insulin levels in the blood,” explains Hall.

“Insulin causes the body’s fat cells to suck in too many calories, and because calories are trapped in the fat cells, the rest of the body is starving. That makes

science progresses,” notes Hall.

Opposite Results

Hall’s first study housed 19 people in a lab where they ate only the food the researchers provided. Those diets cut 800 calories either from carbs (about half of the cuts came from sugar) or from fat for one week each.¹

“When we cut carbs, daily insulin secretion went down,” says Hall. If the carbohydrate-insulin theory were correct, “that should have released fat from their fat cells, boosting fat loss while relieving the internal starvation and therefore causing calorie burning to go up.”

It didn’t. “The number of calories they were burning went down,” says Hall. “So we found the opposite result.” Instead of speeding

up fat loss, the low-carb diet actually slowed it down.

But that study didn’t cut carbs enough or last long enough, argued some critics. So Hall did a longer study (funded in part by NuSI) using a very-low-carb diet.²

“After one month of eating a high-sugar, high-carbohydrate diet, we cut the carbs down to 5 percent, cranked the



Carbs are not *the* enemy, say the latest studies from the Nutrition Science Initiative.

you hungrier, so you eat more calories.”

And because the body is starving, adds Hall, “it slows down its metabolic rate, so it burns fewer calories.” So cutting carbs should boost calorie burning and shrink body fat.

At least that’s the theory.

“The nice thing is that you can design experiments to test it, which is the way



fat up to 80 percent, and kept protein and calories constant,” Hall explains.

The result: “The rate of fat loss actually slowed down for the first two weeks, and then picked back up to the normal rate again for the last two weeks,” says Hall. So the low-carb diet

In studies that last a year or more, the difference in weight loss is negligible.⁴

“Sometimes you can’t see any significant difference, and sometimes you can see a few pounds difference that is clinically meaningless,” notes Hall.

The Diet-Fits Study

“This study should be able to document, for the first time ever, what happens when free-living participants maintain compliance with a very-low-fat diet and a very-low-carbohydrate diet for an entire year,” says the NuSI website.

“I couldn’t be more proud of the study,” says lead investigator Christopher Gardner, professor of medicine at Stanford University.

Gardner’s trial—called DietFits—randomly assigned 609 overweight or obese people to either a healthy low-fat diet or a healthy low-carb diet.

“We told everyone in both groups to eat as little white flour and sugar and as many higher-fiber vegetables as possible,” Gardner explains.

But the participants weren’t told to cut calories.

“If you prescribe calorie restriction, people feel deprived,” says Gardner. “So we just said, ‘Eat as low as you can on fat or carbs and don’t be hungry.’” And,

whether they cut fat or carbs, “each group reported a 500-calorie reduction.”

After a year, each group had lost an average of about 13 pounds.⁵ And, as in earlier studies, the results varied dramatically.

“Someone lost 60 pounds, someone gained 20 pounds, and we saw everything in between,” notes Gardner. “The range, which was similar in both diet groups, was stunning.”

DietFits looked to see if variations in one set of genes could explain the wide range. They didn’t.

“I’m worried that someone will say that genetics doesn’t predict weight loss,” says Gardner. “But humans have about 100 relevant gene variations, and we only looked at a combination of three.”

Other studies have also failed to find genes that explain why some people lose more weight on certain diets.

“We’ve found some statistically significant differences, but none that have a big impact,” says Frank Sacks, professor of cardiovascular disease prevention at the Harvard T.H. Chan School of Public Health.⁶

Nor did it matter if people were resistant to their body’s insulin when they entered the DietFits study.

“We assumed that insulin-resistant people would do better on a low-carb diet—as they did in some earlier studies—but they didn’t,” says Gardner.



Domino’s sells a slew of calories—much of it white flour—for \$5.99.

didn’t speed fat loss.

“We did see a very slight increase in the number of calories that were being burned—57 more a day—on the very-low-carb diet,” adds Hall. But NuSI’s Energy Balance Consortium had agreed beforehand that only an increase of at least 150 calories a day would be meaningful.

“Our results add to the evidence from many other controlled feeding studies on more than 500 people,” says Hall.

Those studies failed to show that cutting carbs boosts calorie burning or fat loss more than cutting fat.³

“If anything,” says Hall, “there is a statistically significant greater fat loss and calorie burning on a low-fat diet. But the effects are so small that they’re physiologically meaningless.”

It’s still possible that a very-low-carb diet curbs dieters’ appetites. “We didn’t test that,” says Hall.

If so, that might explain why some studies report that people tend to lose more weight over the first few months when they are prescribed a low-carb diet.

“But over the long term that doesn’t seem to persist either,” says Hall.



7-Eleven started selling its Big Gulp in 1976. Soda leads to weight gain because its calories don’t register in the brain’s satiety centers.

Maybe that’s because both groups were told to eat healthy foods, he suggests. “In some older studies, when researchers told people to eat less fat,

they weren't particular about which lowfat foods. Coke and white flour and sugar are lowfat."

The full study hasn't been published yet, Gardner's team hasn't yet analyzed data looking at the participants' gut microbes, and two more NuSI studies are still in progress.

But the Arnolds are not funding new NuSI studies. If the Manhattan Project was looking for clear-cut answers, it didn't find them.

Calorie Overload

If it's not carb-fueled insulin surges that are making us—and the rest of the world—pile on the pounds, what is?

"We call it the push hypothesis," says Kevin Hall, "because we have essentially pushed this flood of calories into the food system."²

The goal, he says, was to make sure that nobody went hungry.

"Since the 1970s, we've put in place policies and improvements in agriculture to produce certain crops like corn and soy."

"And companies have come up with lots of very clever ways to engineer those cheap inputs—like high-fructose corn syrup, soybean oil, and white flour—into processed foods."

We're talking about everything from Coca-Cola and Powerade to Big Macs (from corn-fed cattle) and fries, Domino's, Cinnabon, Chipotle, and McCafé Shakes.

"We generated this wealth of cheap, convenient, palatable, highly marketed, and omnipresent foods, and we ate more as a result," says Hall.

And it's not just here. "We see the same effects throughout many nations around the world," says Hall.

The idea may have been to prevent hunger, he notes. But the result was obesity.

"If I had to place my money on what's driving obesity," says Hall, "I'd place it on the way we produce, market, and make highly palatable food available at every turn so you can't avoid it."

Mismatched Brains

So what if companies are constantly pushing us to eat and drink? Why can't we just say no?

One possibility: "The human brain evolved in a time where food was really scarce," says Ashley Gearhardt, assistant professor of psychology at the University of Michigan.

"So it's been optimized over the course

In contrast, we didn't need a defense against eating too much.

"The signals and brakes that we put on eating are pretty weak, because for most of human existence, they were completely unnecessary," says Gearhardt.

In other words, there's a mismatch between our old brains and a new world.

"In our current food environment, food is very available, and the foods that are most advertised and available have been engineered to be more potently rewarding than the foods that were available for much of human history," notes Gearhardt.

Our ancestors may have searched for berries. We can't walk through a mall without being tempted by 1,000-calorie Häagen-Dazs Banana Split Dazzlers with ice cream, fudge, whipped cream, and strawberries.

"People don't report that they can't lose weight because they can't stop eating apples or they're just eating too many beans," says Gearhardt. "The top foods we see people struggling with are pizza, chocolate, chips, cookies, ice cream, and french fries."⁸

And, except for soda, it's not just pure sugar that people crave.

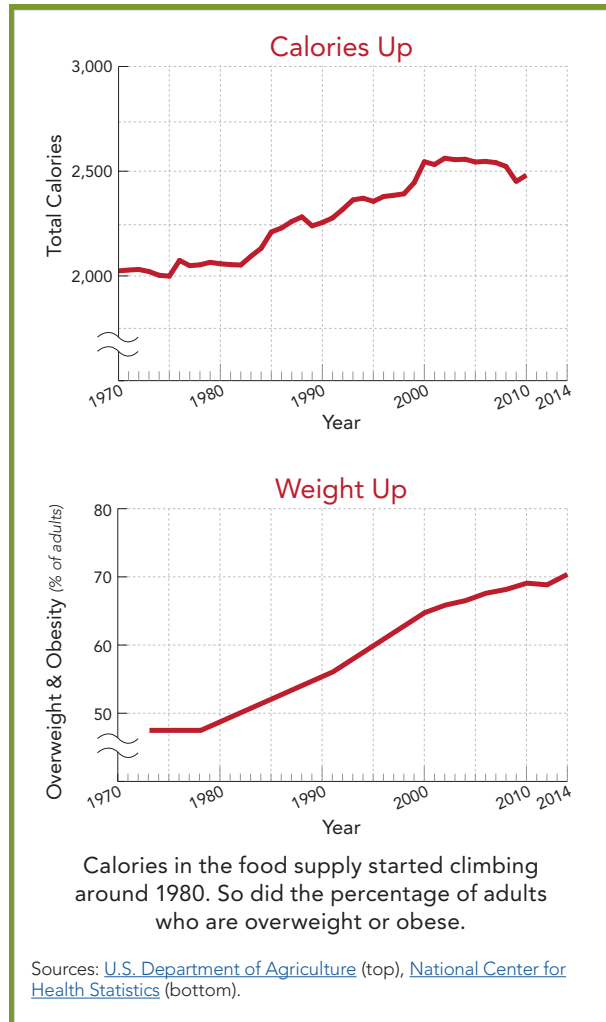
"People struggle the most with foods that have artificially high levels of fats and sugar or white flour, which often come bundled together. Plus many have flavor enhancers," notes Gearhardt.

"People don't struggle with salmon and brown rice and beans or fruits and vegetables. They'll say, 'I love strawberries or I really enjoy salmon,' but they aren't preoccupied with them."

Satiety Override

The body tries to warn the brain when we eat too much.

"Your gut sends signals telling the brain, 'Whoa, the stomach is starting to get a little distended, and I'm noticing there is enough blood sugar here, so we don't need any more calories,'" says Gearhardt.



of evolution to respond to food cues, and in particular to react to calorie-dense food. We're supposed to find foods rewarding and enticing."

That way, if we found a berry bush in the wilderness, "we'd remember how tasty the berries are and be motivated to go back to get them," explains Gearhardt. "So we have strong mechanisms in the brain to make sure we get enough calories."



“But those signals are slow, and they are more like a whisper than a yell.”

Eating a bowl of ice cream? Don’t expect that satiety signal to matter much.

“It’s going to get to your brain much slower than that immediate reward response you get every time you put another spoon of ice cream in your mouth, and it’s saying ‘Ooh, that’s good. More, more, more,’” says Gearhardt.

“The brain is saying, ‘Gosh, pay attention to that—that was awesome.’ And those reward signals are drowning out the slower, more subtle signals that the gut is sending to the brain.”

For some people, it’s even worse.

“When people who struggle with obesity or kids who are prone to weight gain look at a picture of ice cream, their brains are more responsive than those who are less at risk for obesity,” says Gearhardt.

And people who respond more to food commercials than to non-food commercials are more likely to gain weight over the next year.²



Fruits and vegetables are unlikely to override your satiety signals.

Ironically, those traits would have helped people survive in the past.

“For much of human existence, if you had a brain that said, ‘I remember where food is and I’m motivated to get it,’ you’d be more likely to pass on your genes,” notes Gearhardt.

“But because the food environment has flip-flopped, those people are now at a greater risk for health disorders that leave them with a shorter life expectancy.”

Instead, society blames them.

“The narrative is that people who are

What May Help

What can you do to resist the flood of junk food fighting for your attention?

■ **Don’t let yourself get too hungry.** If you’re too hungry, “your gut signals tell the reward system in your brain, ‘You need to really be on the lookout and respond intensely to any food cues you see,’” says Ashley Gearhardt, assistant professor of psychology at the University of Michigan. Her advice: Skip the crash diets and “focus on the quality of the food you eat.”

■ **Don’t drink your calories.** Sugary drinks—soda, sports drinks, energy drinks, or sweetened teas—lead to weight gain.

It’s not clear why. One possibility: liquid calories may not “register.” People eat only slightly less food when they drink a 150-calorie glass of cola with lunch than when they drink a zero-calorie glass of water or diet cola.¹

■ **Find foods that don’t cause war.** Hungry between meals? Try fresh fruit or carrots with hummus.

“Try to identify foods that you enjoy but that don’t cause an intense internal struggle—‘I’m only going to have one bite of this but, oh, God, I want more,’” suggests Gearhardt. “That’s exhausting. The willpower parts of our brain can only take so much.”

■ **Address your stress.** “Stress can be a huge cue,” notes Gearhardt. “Notice the emotional triggers that can set you up to crave palatable rewarding foods.”

Go for a walk, call a friend, try some meditation, or distract yourself. “The

craving will peak and then go down if you don’t give in to it,” says Gearhardt.

Why does stress take a toll?

“When we’re stressed, the executive control system in the brain—the signal to stop eating—is weakened. Stopping ourselves from doing things we want is taxing and energy intense. So when we’re stressed, there isn’t as much energy for that.”

■ **Get enough sleep.** When researchers let people sleep only four hours a



night for five days, they ate more and gained weight.²

In similar studies, “participants reported increased hunger,” says Erin Hanlon, assistant professor in the department of endocrinology, diabetes, and metabolism at the University of Chicago. “And their appetite was greatest for high-carbohydrate or high-fat foods.”

■ **Give yourself a break.** “I ask people to have some compassion for themselves, because it is really hard,” says Gearhardt. “Our food environment is set up to make it hard for people to eat healthier.”

¹ *Appetite* 44: 187, 2005.

² *Sleep* 36: 981, 2013.

struggling don’t have willpower or they just aren’t trying hard enough,” says Gearhardt. “In my clinical work and research, we see people trying so hard.”

“They’ve tried every diet under the sun, they’re willing to get surgeries and come to therapy and sign up for studies. It shows a lack of empathy and compassion to say, ‘It’s all this person’s fault,’ when it’s just a mismatch in someone’s biology and environment.” 🍌

¹ *Cell Metab.* 22: 427, 2015.

² *Am. J. Clin. Nutr.* 104: 324, 2016.

³ *Gastroenterology* 2017. doi:10.1053/j.gastro.2017.01.052.

⁴ *JAMA* 312: 923, 2014.

⁵ professional.heart.org/idc/groups/ahamhah-public/@wcm/@sop/@scon/documents/downloadable/ucm_492225.pdf.

⁶ *Diabetes* 61: 3005, 2012.

⁷ *Lancet* 378: 804, 2011.

⁸ *PLoS One* 2015. doi:10.1371/journal.pone.0117959.

⁹ *Obesity* 22: 2544, 2014.