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Food & Addiction

Can Some Foods Hijack the Brain?

BY BONNIE LIEBMAN

Picture three random American adults in a room. Odds are, one is obese, one is overweight, and one is normal weight.

If the three were children, one would be overweight or obese. And obesity rates in children are still rising.

Clearly, there's no single cause of the obesity epidemic. Our 24/7 exposure to calorie-dense food and long hours at a desk or dashboard play a role. But new evidence suggests that some foods may keep us eating by hijacking the brain like an addictive drug.

"How much overeating in the population is attributable to these foods working on the brain so people keep coming back for more?" asks Kelly Brownell, professor of psychology at Yale University.

"It's possible that once people start consuming these foods, the brain changes in ways that make it very difficult to stop."

Here's what we're learning about food and addiction.

Continued on page 3.



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Food & Addiction

Can Some Foods Hijack the Brain?

“The food industry obviously manipulates the qualities of its foods to maximize desirability,” says Kelly Brownell, who directs Yale University’s Rudd Center for Food Policy & Obesity. “That’s what they’re in business to do.”

“But if some foods start taking over the brain to create a biological demand, that’s a problem,” he adds. “Both animal and human studies suggest that an addictive process is profoundly possible.”

Here’s the evidence that some foods may alter the brain like an addictive drug.

SIGNS OF ADDICTION

What is food addiction?

“There is no clinically recognized definition,” says Marcia Pelchat of the Monell Chemical Senses Center in Philadelphia. In other words, you won’t find food addiction in the Diagnostic and Statistical Manual of Mental Disorders (DSM) that’s used by mental health professionals.

“However, the DSM does have a definition of substance dependence,” notes Pelchat. (Dependence is the clinical term for addiction.) “There’s a list of seven criteria, and you have to meet three of them within a year.”

In 2009, Brownell and his colleague Ashley Gearhardt adapted those criteria to food.

“We wanted to see if traditional criteria for substance abuse could be applied to the eating and obesity arena,” says Brownell. “And it’s pretty clear that the answer is yes.”

In a survey of roughly 350 Yale undergraduates, 11 percent of respondents met the criteria for “food dependence.” In particular, many reported a loss of control when eating, a persistent desire or effort to cut back, and heavy use despite deleterious consequences.¹

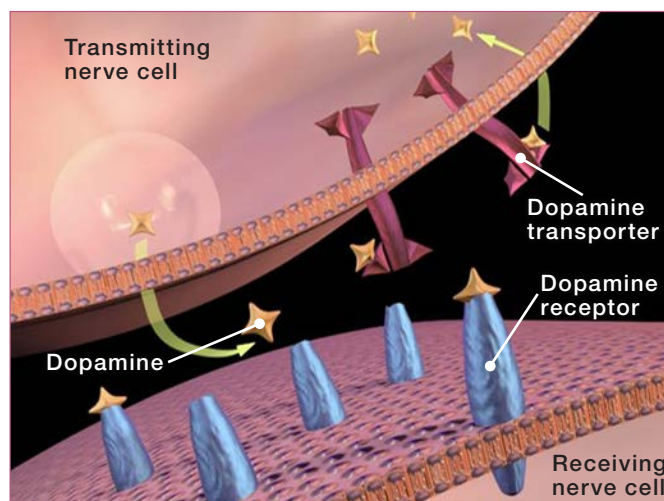
“Once the Yale Food Addiction Scale starts getting administered to large populations, we’ll know more about how common addictive eating is, its relationship to obesity, and its health consequences,” says Brownell.

However, relatively few people fall into that category, he notes. And although

those people need help, they’re not his main worry.

“We’re not as concerned about extreme cases, but the everyday cases of people eating an unhealthy diet,” says Brownell. “I’m less interested in the person who sits down and eats 15 doughnuts than the person who gets up in the morning and needs a sugared beverage to get the day going.”

The bigger question: “Can you make



How Dopamine Sends a Message. Food (or drugs, music, sex, etc.) causes nerve cells in the brain to send dopamine to receptors on neighboring nerve cells. Transporters reabsorb the dopamine that doesn’t reach the receptors.

a case that the brain is being hijacked enough by certain foods that you’ve got a public health crisis?”

To find answers, some scientists have zeroed in on how the brain’s response to some foods can parallel its response to drugs.

DOPAMINE

In 2001, Nora Volkow and her colleagues at the Brookhaven National Laboratory published a groundbreaking study called “Brain Dopamine and Obesity.”

The results were stunning. Very obese people had lower levels of dopamine in the “reward” areas of their brains than did people who were normal weight (see illustration, p. 4).²

“These brain scans were game-changers,” says Pamela Peeke, assistant clinical professor of medicine at the University of Maryland School of Medicine. “Because this is precisely the same thing that happens in meth heads, cocaine addicts, alcoholics, and other addicts.”

Dopamine is a neurotransmitter that motivates us to eat (and engage in sex and other “rewarding” behaviors). It reflects *wanting* more than *liking*. Animals that lack dopamine starve to death because they have no motivation to eat.

“This is the mechanism that nature created to enable you as an individual and species to survive,” says Volkow, now the director of the National Institute on Drug Abuse. “If you ate a banana and it was delicious, the next time you were in the jungle and you saw it, you’d have this drive to eat it.”

Drugs like cocaine, heroin, and morphine can hijack the system.

“By the randomness of nature, certain chemicals are able to activate the same circuits,” explains Volkow. “And they do it in a way that’s much more potent” than anything natural.

Yet her brain scans are surprising. If dopamine makes you want to eat or take drugs, why would people who are obese or addicted to drugs have *less* of a dopamine

response when they eat or take drugs?

“We used to believe that people were addicted because they were more sensitive to rewarding effects,” says Volkow. “We thought they had more dopamine release, that it would be more pleasurable. However, it’s the opposite.”



Less reward makes them want more.

"It appears that people who don't get much reward from food or drugs want more and more because they never are satisfied," says Monell's Marcia Pelchat. (Monell Chemical Senses Center is a scientific institute that does research on taste and smell.)

Chicken or Egg?

It's a chicken-or-egg question.

Do some people overeat because they are born with a dopamine system that doesn't respond? "Or do obese people have a low dopamine response because they overeat and overstimulated their dopamine system?" asks Pelchat.

"There's some evidence for both."

To sort things out, researchers are trying to look at dopamine responses before obesity sets in. Some findings:

■ **Rats fed junk food.** Some studies see changes in dopamine release when rats are offered a so-called cafeteria diet.

"We gave animals access to foods that people might want to overeat—cookies, cheese, chocolate chips, marshmallows, and similar items," explains Nicole Avena, assistant professor of psychiatry at the University of Florida College of Medicine.

After a few months, the rats became obese and had lower dopamine levels than rats fed ordinary lab chow.^{3,4}

"Once they have this history of overeating this highly palatable junk-food diet, their brains have changed," explains Avena. "These changes are profound and long lasting."

Could obesity itself weaken the dopamine system? To find out, Swiss researchers made sure that rats fed ordinary chow got as many calories as rats fed a calorie-dense diet that was high in fat and sugar.⁵

"Both groups gained weight, but the group fed the calorie-dense diet had a reduction of dopamine receptors while the other group did not," explains Kyle Burger, a researcher at the Oregon Research Institute's Eating Disorders and Obesity Prevention Lab, which is headed by Eric Stice.

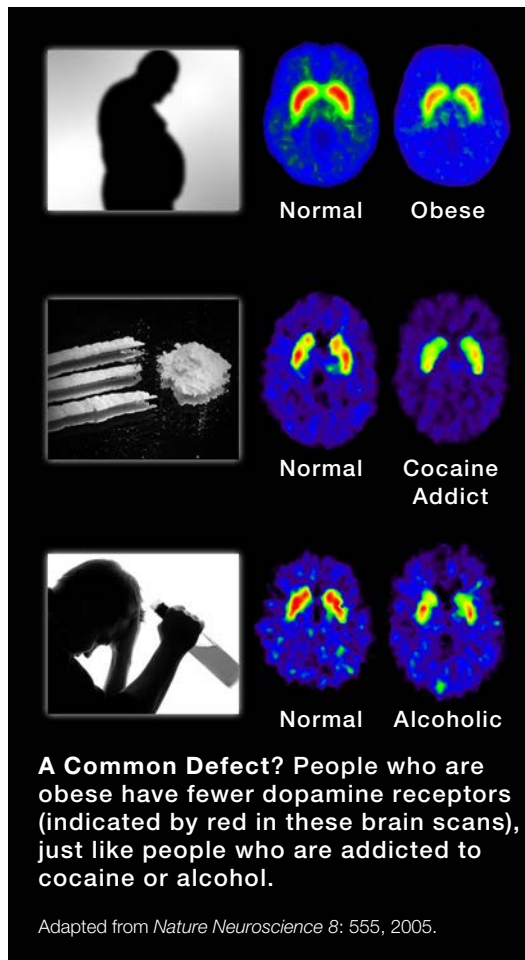
"So it's not necessarily weight gain—but the process of overeating calorie-dense foods—that changes dopamine receptors."

■ **Less response after weight gain.** In a study of 26 young overweight and obese women, those who gained weight over six months had less response in areas of the brain targeted by dopamine when

they drank a milkshake than they had six months earlier.⁶

"They also showed a reduced dopamine response compared to the overweight women who remained weight-stable," notes Burger.

A lower dopamine response may be a double whammy for weight gainers. First, it might make them more likely to overeat. And overeating may dampen the dopamine response even more.



■ **More response before weight gain.** To study obese people *before* they become obese, Burger's colleagues compared 30 teenagers who were at high risk for obesity (each had two overweight or obese parents) to 30 teens at low risk. All were normal weight.

Those at high risk for obesity had a greater response in the dopamine target regions after drinking milkshakes than low-risk teens.⁷ So obese people may start out not with an insensitive, but an *oversensitive*, dopamine response.

"We think this initial vulnerability is the hook that gets you in," explains Burger. "Then you repeatedly consume the

food because you're 'chasing the high.'"

Burger and his colleagues are tracking the teens, "so we'll know in a year or two."

Cues & the Cortex

Researchers see another similarity between drug abuse and obesity.

Obese adolescent girls show less response in dopamine target areas when drinking milkshakes than girls who are normal weight. However, the heavier girls show a greater response to *pictures* of the shakes.⁸

"And the girls who respond most to food images are more likely to gain weight over the next year," adds Burger.

Likewise, people who score higher on the Yale Food Addiction Scale show greater activity than others in the reward areas of the brain when they see pictures of a milkshake, but less activity when they drink it.⁹

It's the same pattern seen with drugs. In fact, that's what makes many people relapse after treatment for drug abuse.

"The moment an addictive individual sees a person they've taken the drug with or drug paraphernalia, dopamine release triggers an enormous desire to take the drug," says Volkow. "And that's why they relapse."

When it comes to food, the cues are everywhere. "This hyper-response to the cues—and reduced response to the food—implies that obese people may not have a compromised dopamine response to begin with," says Burger.

Of course, milkshakes aren't cocaine. "If someone were to take an illicit drug, it would release far more dopamine than Häagen-Dazs," he notes.

And, needless to say, rats aren't people. "Rats are working off of their impulses," says Avena. "Humans have highly developed cortexes so we can make decisions."

That's no reason to dismiss rat studies, she adds. "They illustrate that we might need to exercise a lot of control over the way we think about food because of what our primitive brains are telling us to do."

When it comes to drugs, changes in the dopamine system may cause changes in the cortex. And in the obese, fewer dopamine receptors are linked to less activity in the cortex.¹⁰

"Repeated exposure to drugs disturbs a carefully calibrated balance in the frontal cortex that is needed to exert control, make decisions, and exercise judgment," says Volkow. "This area is the brain's brakes. Ad-

“That’s How I’m Wired...”

“For a long time, I didn’t like the word addiction because it felt like it was a disease,” says Liz Gordon of Corpus Christi, Texas.

But she came to accept that her inability to resist sugar was more than just a sweet tooth.

“It’s an obsession, a craving,” she explains. “I really have to be mindful to stop myself. Because if I start, oh gosh, it’s going to be hard to stop.”

Gordon, now 60, never was an out-of-control binge eater. And she was never quite obese. “I was always 5 or 10 pounds overweight.”

But in her 50s, the weight started to pile on. “I was almost up to 170 pounds as a 5-foot, 4-inch woman,” she notes. At 175 pounds, she would have crossed the line from overweight to obese.

Sweets were always her downfall. “I remember my mother hid chocolate in the cupboard when I was young,” says Gordon. “I remember enjoying it so much and wishing I could eat it like everyone else and not overdo it.”

But it was a constant battle. “For the moment it tastes good, and then afterwards, it’s like ‘Ugh...why did I do that?’ I’m not so addicted that I would go on a three-day binge. But I would get so discouraged and feel so defeated that I’d start to self-sabotage. I’d think, ‘Oh, forget it. Obviously, I can’t control this.’”

It’s not clear if a brain scan would show that Gordon has fewer dopamine receptors—a telltale sign of addiction. And there are no established criteria that doctors can use to diagnose food addiction in their patients.

In any case, she has turned things around. “I’ve lost 38 pounds in the last five years.” Gordon credits much of her success to Pamela Peeke, an assistant clinical professor of medicine at the University of Maryland School of Medicine who runs the Peeke Performance Center for Healthy Living. (Peeke’s latest book, *The Hunger Fix: The Three Stage Detox and Recovery Plan for Overeating and Food Addiction*, is scheduled to be published by Rodale in September.)

“It was helpful for me when Dr. Peeke said that there’s something called a sugar addiction,” says Gordon. “That validation is extremely important. It isn’t something that I can just control



“If I start, it’s going to be hard to stop.”

and it will go away. That’s how I’m wired. I’d like to say that someday I won’t have to work at this. Well, no, it’s never going to be like that.”

Peeke’s program consists of what she calls the three M’s—mind, mouth, and muscle. “I still do Weight Watchers online,” says Gordon. “That’s been my form of structural dieting.”

She doesn’t avoid sugar completely. “I can’t,” she says. “I’ve tried. It’s not possible because sugar is in so many foods. I try for moderation. I say, ‘Oh, I’ll just have one bite’ or ‘Oh, I won’t keep ice cream in the house so I’ll have to go out to get it.’”

But now she plans ahead. “If I’m going out for the day, doing errands or going to the gym, I’ll bring fruit or other snacks with me. If I don’t consistently eat meals and some sort of protein snack in between, that’s when I give in to a craving. I think, ‘Darn, I’m in the store. I’ll just get that bag of licorice.’”

Fortunately, the “muscle” part comes easy for her. “I’ve always exercised. And I’ve gotten more into working out harder. Spinning class has been very successful. I feel good afterwards. I feel more in control, and now I can go about my life.”

Peeke counsels her once or twice a month by phone. “It’s having a person who reminds you to be mindful, vigilant, and accepting,” says Gordon. “Meditation has also become essential.”

And she has learned techniques to keep from sabotaging herself. “Last night, I was stressed about our upcoming move to Kansas. So what did I have for dessert? A fudge brownie sundae. When I’m worn down and tired, that’s when the demons set in. But I got up today and it’s a new day. I said, ‘Okay. Don’t go down the slippery slope.’”

Sometimes she passes up social events. “I say, ‘If I go to that party, I’m going to eat whatever I want.’ My husband says, ‘Just go and don’t do it. Why the drama?’ That’s because I don’t look like a person who has a problem. But I do.”

Denial takes a lot of mental energy, says Gordon. “I spent years thinking, ‘I don’t think I ate that much candy or dessert or whatever. How can I be gaining weight?’ Who was I trying to fool?”

Those days are over, she adds. “You feel a freedom when you’re not battling with yourself.”

dicted people don’t understand why they take the drug. It’s like they’re driving and they can’t stop. They have no brakes.”

WHICH FOODS?

Can any food be addictive?

“Sugar has been studied far more than anything else,” says Brownell. Is fat a player? What about salt or all the preservatives and additives that go into food?

“Or the flavorings or what the industry

euphemistically calls ‘flavor enhancers,’” adds Brownell. “What are those things doing in the brain? Nobody knows.”

But researchers have some clues.

Animals

■ **Sugar.** Working with the late Bart Hoebel of Princeton University, Nicole Avena found that rats showed signs of dependence when exposed to sugar for only a few hours a day.¹¹

“When animals get sugar, they’ll overeat,” she explains. “And they’ll show tolerance to it—they eat more and more each day, perhaps to feel the same euphoria.”

“If we take the sugar away, they’ll show signs of withdrawal—anxiety, tremors, and shakes,” she adds. “And they’ll show evidence of craving for the sugar. They’re willing to work harder to get at sugar, and they show behaviors to suggest that they’re seeking the sugar.”



They also end up with fewer receptors for dopamine and opioids.¹² “With sugar, there’s neurochemical and behavioral evidence of dependence,” says Avena. “And the changes are similar to what you’d expect to see if the animals were dependent on drugs of abuse, not just eating a tasty food.”

■ **Fat.** Avena’s team has also tested high-fat diets on rats.¹⁰ “We see the same types of behavior emerging,” she notes, “except that when animals have access to fat, they don’t show signs of withdrawal.”

Researchers think that a brain chemical called galanin may explain why. “When an animal is eating fat, it releases galanin in the brain,” explains Avena. “And in other studies, galanin counteracted the effects of opiate withdrawal.”

No withdrawal doesn’t mean no addiction, though. “There are some drugs of abuse, like cocaine, that are addictive but don’t always result in clear signs of withdrawal,” says Avena. “We see withdrawal most clearly with opiate-based drugs like heroin or morphine.”

Another difference: When rats get just sugar, they eat less food, so they don’t gain weight. “But when we give them a combination of sugar and fat or even if they get fat alone, they do show signs of obesity,” she notes.

And that’s critical, because “people don’t eat sugar alone,” says Avena. “They eat sugar in combination with fat and salt and other things.”

■ **Restricted access.** Rats don’t show signs of addiction if sugar or fat is always available. “When they can have unrestricted, unlimited access to sugar, they snack on it all day,” says Avena. “They don’t binge, and they don’t show signs of addiction.”

But “there’s something about overeating that leads to changes in the brain and behaviors that suggest addiction,” she notes. “And to get the animals to overeat, we have to impose restrictions.”

In most studies, the rats get no food during the 12 hours when they typically sleep. Then they get no food or sugar for four hours after they wake up.

“It’s a bit like skipping breakfast,” says Avena. After a while, the animals start eating fewer, but larger, meals each day.

Does that mirror what happens to people? “Everyone overeats now and then,” observes Avena. “Thanksgiving is the classic holiday when everyone eats too much.”

“But what we see in some of our human patients who are overeating is that the

What to Do



Exercise may boost brain volume and replenish dopamine receptors.

What may keep you from overeating?

■ **Avoid mindless eating.** “People tend to eat whatever’s on the plate in front of them,” says Monell’s Marcia Pelchat. “If you’ve eaten half the food on your plate at a restaurant, push the plate away.”

And don’t leave food around. “You’re more likely to eat food out on the counter than if it’s in a cabinet, even though you know it’s in there,” adds Pelchat. “It’s what Brian Wansink of Cornell University calls ‘mindless eating.’”¹

■ **Beware of cues.** “Smells can trigger desires for foods, like popcorn in a movie theater or cinnamon buns in the mall,” notes Pelchat.

“Think about walking into a movie theater. We’ve seen all the reports that movie-theater popcorn is bad for you. It’s stale, it’s popped in yucky fat, fake butter, and yet we all crave it because we’re used to getting popcorn at the movies.”

Smells aren’t the only cues. “If you have a cookie every time you walk into the house before you make dinner, you’re going to want a cookie when you walk into the house,” says Pelchat.

And then there’s advertising. “You see the biggest rise in dopamine release when people see cues,” says the University of Maryland’s Pamela Peeke. “That’s why marketing is so powerful.”

■ **Avoid the troublemakers.** Many people know which foods make them lose control, says Peeke. “One woman told me, ‘I have never in my life eaten a frozen Sara Lee cheesecake thawed.’ She just dives into it frozen.”

The answer, says Peeke, is a detox and recovery plan. “You can’t drop the weight and go back to cookies again. I tell patients, ‘I can give you something very rewarding, but it won’t include sugary, fatty, salty, processed glop.’”

■ **Eat healthy foods.** “It hasn’t been documented, but when people go on a diet and start eating a lot of fish and vegetables, they eventually start craving those foods if they stick to it long enough,” says Pelchat.

“Don’t think about depriving yourself. Just think about adding a serving of something to your diet once a day for two weeks. If you’re eating, say, five servings of fruits and vegetables a day, you’ll have less time to eat other things.”

And don’t assume that you have to banish calorie-dense foods from your diet. Oils, nuts, and avocado are calorie dense. But sprinkle them on a big bowl of greens and the calorie density plummets. (See “Don’t Be Dense,” March 2012.)

■ **Distract yourself.** “Dieters say, ‘It won’t matter if I give in just this once,’ but the behavior-modification people say it does matter,” says Pelchat. “You have to practice breaking the automatic response.”

How? “Some people recommend engaging in another absorbing or enjoyable activity when you have a food craving,” she suggests. “Listen to your favorite music, read a book, tap dance. Anything you can do to put a delay between thinking of the food and reaching for it will make it more likely that you’ll forget about it.”

■ **Beware of stress.** “When you are stressed, you’re much more likely to fall into the pattern of eating more food than you wanted to,” says the National Institute on Drug Abuse’s Nora Volkow.² “Food can reduce anxiety. It’s no coincidence that we talk about comfort foods.” And don’t get too hungry. That intensifies the drive to eat.

■ **Exercise.** In rats, running on a treadmill can increase dopamine receptors.³ And in sedentary people in their 60s and 70s, an aerobic exercise program increased the volume of the brain’s cortex.⁴

“We now have brilliant data that shows an increase in prefrontal cortex nerve cells,” says Peeke. “That’s extremely important because this is where you have executive function and rein in impulses. And guess what? It doesn’t have to be extreme activity.” Brisk walking is good enough.

¹ *Physiol. Behav.* 100: 454, 2010.

³ *Neurosci. Lett.* 79: 138, 1987.

² *Physiol. Behav.* 103: 157, 2011.

⁴ *J. Gerontol. A Biol. Sci. Med. Sci.* 61: 1166, 2006.

person has to feel that they have little control over their eating. They can't stop even though they want to."

How common is binge eating? No one knows for sure. "But the numbers are growing," says Avena. "More and more patients report it to us at clinics. It's the most common eating disorder, and it can be seen in people who are obese, normal, or underweight."

And although most people have access to food all day long, there are some parallels for dieters.

"Many people restrict themselves from eating," says Avena. "They wake up every day and decide that they're not going to eat anything because they're starting a diet. Anyone who goes on a diet is restricting their calories."

And that may make it harder to stick to the diet. "Restricting food promotes the intake of the palatable food when it becomes available," says Avena.

Humans

■ **Calorie-dense foods.** In its studies on people, Kyle Burger's research team started with milkshakes because they're not just sweet and fatty, but calorie dense. That is, they have a lot of calories per swallow.

"It looks like the habitual consumption of food—specifically calorie-dense food—can elicit changes in brain responses that mirror drug addiction," says Burger.

Studies on craving also point to calorie-dense foods.¹³

"We ask people, 'Have you craved any food in the last year?'" notes Monell's Marcia Pelchat. "And we give them a definition of craving, which is an intense desire to eat a particular food."

Craving isn't addiction, she adds. "The vast majority of people have cravings, and that wouldn't qualify as having an addiction."

What do people crave? "About 95 percent of the foods are calorie dense and high in fat," says Pelchat. "Fat is more calorie dense than carbohydrates or protein. One guy told me he craved Belgian endive, but he was thinking of it sautéed in cream sauce."

Among college students, who are most often surveyed in eating studies, "maybe 60 percent of what women write down are sweet foods, and they're usually also high in fat," says Pelchat. "Among men, 40 percent of the foods they crave are sweet."

Why do calorie-dense foods appeal

to us? Because as humans evolved, those foods gave us the best chance of staying alive when food was scarce.

Eating too much wasn't a threat to our survival. "Our bodies are built to regulate rigorously when deprived of calories," says Pelchat. "So when we feel hungry, we go after food, and we're really aware of it."



When foods are sweet, fatty, calorie dense, and varied, we want to eat more.

But when we overeat and food is stored as fat, the brain doesn't necessarily see it.

"Once food is stored away as fat, it's gone," says Pelchat. "You don't walk around saying, 'I'm not hungry because I've got 20 pounds on each thigh.' You get hungry because that fat isn't really accessible."

"So the system makes us eat a lot when we have a calorie deficit, but doesn't do much when we have an excess."

■ **Variety.** "We are conditioned to a diversity of extraordinarily appealing food everywhere," says Volkow.

It doesn't matter if we've just eaten.¹⁴ "We can overcome the body's normal satiety signals if we see food that we remember tastes very good," she explains.

After dinner, "no more dopamine will be triggered by seeing a piece of chicken, but it may be triggered by dessert," says Volkow. "You see some Godiva chocolates and you want them."

And it's not just one piece of chocolate. "I can eat one chocolate and get satiated, but then I turn around and there's all these other varieties, and they're novel and intriguing."

■ **Hyperpalatable foods.** "Our theory is that if the body gets normal food found in nature, most people won't overdo it," says Yale's Kelly Brownell.

"The body's satiety mechanisms will activate and behave in a reasonable way. But when you process the foods so much that they become hyperpalatable, it thwarts the body's ability to regulate."

It's like coca leaves and cocaine, he suggests. "When you get the coca leaf in nature, it's mildly reinforcing but people don't overuse it. But when you process the coca leaf into cocaine, all hell breaks loose, and it overrides good judgment, wisdom, and responsibility."

Brownell says that "you can make the same argument for these hyperpalatable foods. The body just doesn't know how to handle them."

Clearly, research on food and addiction is just gathering steam.

"We need studies that follow people over time," says Brownell. "What exist now are snapshots in time."

But if the early clues pan out, people may look more carefully at how much and how often they "indulge."

Says Burger: "The take-home message is that the frequent consumption of calorie-dense food may be altering your brain responses in a way that's going to make you consume more." 🍌

The Bottom Line

■ Research on food and addiction is in its infancy. But studies suggest that overeating may dampen your dopamine response. That weak response may make you overeat even more.

■ You may be more likely to overeat foods that are calorie dense, fatty, or sweet.

■ Stress and dieting can lead to overeating.

■ For more information, see the Rudd Center for Food Policy & Obesity at Yale University (www.yaleruddcenter.org). You can watch parts of a 2009 Food Addiction Summit at www.foodaddictionsummit.org/agenda.htm

¹ *Appetite* 52: 430, 2009.

² *Lancet* 357: 354, 2001.

³ *Neuroscience* 159: 1193, 2009.

⁴ *Nat. Neurosci.* 13: 635, 2010.

⁵ *Neuroscience* 171: 779, 2010.

⁶ *J. Neuroscience* 30: 13105, 2010.

⁷ *J. Neuroscience* 31: 4360, 2011.

⁸ *J. Abnorm. Psychol.* 117: 924, 2008.

⁹ *Arch. Gen. Psychiatr.* 68: 808, 2011.

¹⁰ *Neuroimage* 42: 1537, 2008.

¹¹ *Physiol. Behav.* 104: 87, 2011.

¹² *Neurosci. Biobehav. Rev.* 32: 20, 2008.

¹³ *Physiol. Behav.* 76: 347, 2002.

¹⁴ *Am. J. Clin. Nutr.* 92: 697, 2010.

WEIGHT-LOSS SUPPLEMENTS

What's to lose?

BY DAVID SCHARDT

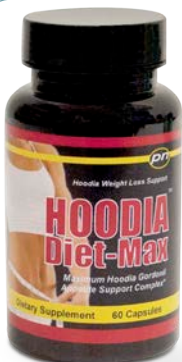
One in three overweight or obese Americans say that they take supplements to lose weight. Odds are, they're wasting their money.

"The results are probably less than what they were expecting," says Melinda Manore, a nutrition and exercise researcher at Oregon State University in Corvallis.

Most weight-loss supplements don't help at all, while a few may lead to the loss of an extra pound or two per month...at least for the first few months. But most studies do little or no follow-up to see what happens later.

Here's what researchers know about which ingredients work and which don't.

Hoodia



Typical claims: "Make your brain think you're full." "Reduce your appetite in minutes."

What is it? Hoodia is a South African plant that hunters traditionally ate to suppress their appetite on long trips in the Kalahari Desert.

How it "works": Hoodia reduces food cravings, so you eat less.

The evidence: Multinational corporation Unilever bailed out of its \$27 million investment in hoodia in 2008. Now that the company has published its clinical trial of the supplement, we know why.

For two weeks, researchers housed 42 healthy overweight women aged 18 to 50, gave half of them hoodia and half of them a placebo before breakfast and dinner each day, and let them eat as much or as little as they wanted for their meals and snacks. The women who got the hoodia ate just as much food and didn't lose any more weight than the women who got the placebo.¹

Worse, the hoodia takers suffered more than five times the number of side effects—including headaches, dizziness, nausea, vomiting, fatigue, and gas. And their blood pressure rose 5 to 16 points higher than the placebo takers' during the two weeks.

Bottom line: Hoodia won't help you lose weight and may cause unwelcome side effects.

¹ *Am. J. Clin. Nutr.* 94: 1171, 2011.

Caffeine

Typical claim:

"Burns fat and calories."

What is it? Caffeine is the stimulant in coffee, tea, and colas. It's also added to a slew of weight-loss supplements.

How it "works":

Caffeine increases blood levels of epinephrine, a hormone that speeds up the metabolic rate and helps burn fat that the body stores in muscle tissue.

The evidence: In six studies, people burned about 100 more calories a day after consuming 270 milligrams, 600 mg, 1,250 mg, or 1,600 mg of caffeine, but not after consuming 150 mg.^{1,2} (A 16 oz. grande brewed coffee at Starbucks has 330 mg of caffeine.)

"Despite that, there is little evidence that consuming caffeine leads to significant weight loss or helps people keep weight off," says Oregon State's Melinda Manore.

For example, among 58,000 health professionals tracked for 12 years, men who increased their caffeine intake from an average of 180 mg a day to 435 mg weighed only about one pound less than men who cut their caffeine from 550 mg a day to 200 mg. Likewise, women who stepped up their caffeine consumption from 200 mg a day to 380 mg also weighed only about a pound less than women who decreased their caffeine from 500 mg a day to 200 mg over the 12 years.³

"Long-time consumers of caffeine may alter their eating habits to compensate for the extra calories burned," notes Manore.

And in the only controlled trial of caffeine for weight loss, 35 obese men and women who followed a reduced-calorie diet and took 200 mg of caffeine every day for six months lost no more weight than 35 similar people who dieted and took a placebo.⁴ "Caffeine consumers may develop a tolerance to its effects," Manore suggests.

Bottom line: There is not enough evidence to say that caffeine can help you lose weight.

¹ *Obes. Rev.* 12: e573, 2011.

² *Am. J. Clin. Nutr.* 70: 1040, 1999.

³ *Am. J. Clin. Nutr.* 83: 674, 2006.

⁴ *Int. J. Obes. Relat. Metab. Disord.* 16: 269, 1992.



Glucomannan



Typical claim: “Reduce pounds of body fat and weight without a change in lifestyle.”

What is it? Glucomannan is a soluble dietary fiber and the main ingredient in Lipozene, a weight-loss supplement that has been advertised on TV for years.

How it “works”: Glucomannan swells up with water in the stomach. That makes people feel full, which leads them to eat less.

The evidence: Two published studies have tested glucomannan in dieters who were consuming 1,200 calories a day. (The typical American eats 1,500 to 2,750 calories a day, depending on sex and age.) Those who took 1.5 to 4 grams

a day of glucomannan before meals lost three to four more pounds over five to eight weeks than those who took a placebo.¹ But in seven other studies where the participants *didn't* cut their calories, glucomannan had no effect on weight. So much for no change in lifestyle needed.

Bottom line: Taking glucomannan before every meal may help you lose a few extra pounds if you're cutting calories.

Warning: Because glucomannan swells up so much, it can cause choking or block the throat, esophagus, or intestines unless it's taken with at least eight ounces of water or other fluid. Never take glucomannan immediately before going to bed.

¹ *Am. J. Clin. Nutr.* 88: 1167, 2008.

Exotic Fruit

“Miracle” weight-reducing fruits seem to find a home on the Internet. Here's why you should think twice before picking one of these three:

African mango. Slick ads claim that extracts of this West African fruit, which is rich in soluble fiber, will melt away 10 to 12 pounds in just four weeks without dieting. Only one study has been published that compared an extract of the fruit with a placebo in people trying to lose weight. It was conducted in the African nation of Cameroon by the extract's inventor and was funded by the patent holder in California.

The striking result: after 10 weeks, extract takers had lost 27 more pounds and three more inches from their waists than placebo takers.¹ But before starting to pop African mango pills, we'd wait until researchers who don't have a financial stake in the results test the fruit extract.

Lichi. No studies have looked at whether lichi (or lychee) supplements curb appetite or reduce body fat, as ads in magazines and on the Internet claim.

Açai. For more than five years, Internet fraudsters have been shamelessly hawking açai berry pills for easy weight loss. But there are still no published studies showing that açai does anything to help with weight, fat, or muscle.

¹ *Lipids Health Dis.* 8: 7, 2009.

Green Tea Extract

Typical claim: “Speeds Up Fat Burning.”

What is it? Typically EGCG, the most abundant antioxidant in green tea.

How it “works”: EGCG prevents the breakdown of the hormone and neurotransmitter norepinephrine, which leads to increased calorie burning, especially of fat.

The evidence: Most long-term studies are disappointing.

A meta-analysis of six weight-loss trials studied a total of about 260 mostly overweight or obese men and women who took an average of 520 milligrams of EGCG (or similar compounds from green tea) plus about 120 mg of caffeine every day for roughly three months. (An 8 oz. cup of brewed green tea contains about 200 mg of EGCG and 45 mg of caffeine.)

Overall, the participants lost an average of one pound more than similar people who got a placebo.¹ “The changes observed are not likely clinically relevant,” wrote the authors.

Bottom line: “EGCG combined with caffeine may have a small effect on weight loss, but it's not clear what the ideal dose is or who is most likely to benefit,” says Oregon State's Melinda Manore.

Warning: Worldwide, green tea extracts have “probably” caused at least seven cases—and “possibly” caused another 27 cases—of liver damage, according to the United States Pharmacopeia.² “Toxicity was more likely to occur if the extracts were taken on an empty stomach,” notes Manore. 🍵

¹ *Am. J. Clin. Nutr.* 91: 73, 2010.
² *Drug Safety* 31: 469, 2008.



Not Yet Ready for Prime Time

■ **Chromium picolinate.** A new claim that the supplement controls food cravings and appetite is based on one small trial on people who craved sweets. Twenty-one healthy overweight women who took 1,000 micrograms of chromium picolinate every day for eight weeks ate 110 fewer calories at lunch and 140 fewer calories at dinner on the final day of the study than 19 placebo takers.¹ But the chromium takers didn't report any less craving for sweets, and longer-term studies show little impact of chromium on weight.²

■ **Conjugated linoleic acid (CLA).** CLA supplements, which contain a mixture of unsaturated fats that are made from safflower or other vegetable oil, are “clinically proven to reduce body fat up to 10%,” according to the leading CLA manufacturer. But CLA reduced body fat more than a placebo in only two of the five good studies that were conducted during the past five years.³⁻⁷ “The effect of CLA is inconsistent, and we don't know why,” says researcher Michael McIntosh of the University of North Carolina at Greensboro.

¹ *Diab. Technol. Ther.* 10: 405, 2008.

² *Int. J. Obes. Relat. Metab. Disord.* 27: 522, 2003.

³ *J. Nutr.* 137: 1188, 2007.

⁴ *Obesity* 16: 1019, 2008.

⁵ *J. Nutr.* 141: 1286, 2011.

⁶ *Am. J. Clin. Nutr.* 90: 468, 2009.

⁷ *J. Nutr.* 139: 1347, 2009.

Keep It Small



From which bowl would you eat the fewest M&M's?

People eat more when they're offered larger servings. But is it more food—or bigger plates, bowls, bags, or other containers—that makes the difference?

To find out, Belgian researchers offered 88 college students one of three bowls of M&M's to snack on as they watched a 22-minute TV show: a small (one-cup) bowl filled with 7 ounces of candy, a large (three-cup) bowl with 7 ounces of candy, or a large (three-cup) bowl filled with 21 ounces of candy. The students ate twice as much candy from the two large bowls (about 2 ounces, or 300 calories' worth) than they did from the small bowl (about 1 ounce, or 150 calories' worth).

What to do: If your dishes are generously sized and you're trying to eat less, maybe it's worth investing in a new set. And keep in mind that you might eat more of the remaining chips or cookies or crackers at the bottom of a large bag than you might from a smaller bag. Also, repackage food from large bags into smaller (preferably reusable) containers. And if you don't want to eat the entire dish at a restaurant, ask the server to wrap half of it up before it reaches the table.

Appetite 58: 814, 2012.

Sodas & Heart Disease

"Diet soft drinks linked to heart disease," ran the headline in *The New York Times* in February. But a second, larger study released since then found no link.

The first study tracked roughly 2,500 middle-aged and older men and women living in upper Manhattan for 10 years. Those who drank diet sodas every day had a 43 percent higher risk of heart attacks, strokes, or other "vascular events" than those who drank no diet sodas. Those who drank sugar-sweetened sodas had no increased risk.

The second study followed more than 42,000 male health professionals for 22 years. Those who drank the most sugar-sweetened sodas (roughly one a day) had a 20 percent higher risk of heart disease than those who drank none. However, those who drank diet sodas (roughly one a day) had no higher risk than non-diet-soda drinkers.

Why did the results differ? First, the Manhattan study's results are less reliable because so few of its participants drank diet soda.

Only 163 New Yorkers—compared to 10,000 health professionals—drank diet soda daily.

Second, the New Yorkers who drank diet sodas were more likely to have high blood pressure, diabetes, high triglycerides, a large waist, or a previous diagnosis of heart disease or peripheral vascular disease than the New Yorkers who drank no diet soda.

It's possible that "people at increased risk of vascular events due to pre-existing vascular conditions may be advised to switch from regular to diet soft drinks," note the authors. If so, those conditions—not the diet soda—could have caused their heart attacks or strokes.

What to do: It's worth limiting diet sodas to avoid their aspartame and/or acesulfame potassium, two poorly tested artificial sweeteners, but not to lower your risk of heart attack or stroke.

J. Gen. Intern. Med. DOI:10.1007/s11606-011-1968-2
Circulation DOI:10.1161/CIRCULATIONAHA.111.067017

Triglycerides & Stroke

High blood levels of triglycerides may signal an increased risk of stroke, at least in women. A growing body of research suggests that high triglycerides are more dangerous for women than for men.

In a study of roughly 1,500 participants in the Women's Health Initiative, those with the highest triglycerides (192 mg/dL or more) were 56 percent more likely to have an ischemic stroke over an eight-year period than those with the lowest triglycerides (less than 104 mg/dL), after the researchers accounted for other risk factors like blood pressure, weight, exercise, and smoking.

Once those factors were accounted for, neither LDL ("bad") nor HDL ("good") cholesterol affected stroke risk. (Ischemic strokes—which are typically caused by a blood clot that gets lodged in a partially clogged artery in the brain—are more common in the United States than strokes caused by a hemorrhage.)

What to do: If your triglycerides are over 100 mg/dL, lose excess weight, cut back on sugars, and replace saturated and trans fats with unsaturated fats. Omega-3s from fish oil pills can also lower triglycerides at doses of 2 to 4 grams a day.

Stroke 43: 958, 2012.

Vitamin D & Diabetes

A new study offers one more clue—though not solid proof—that vitamin D helps prevent diabetes.

Researchers studied roughly 2,000 people in the U.S. Diabetes Prevention Program. All had pre-diabetes—that is, their fasting blood sugar levels were higher than normal (at least 95 mg/dL) but not high enough to be diabetes (over 125 mg/dL). Half of the people were assigned to an intensive program to lose at least 7 percent of their body weight, and the other half received standard advice to lose weight and exercise.

After nearly three years, people in both groups who had the highest blood levels of vitamin D (roughly 30 ng/mL) had about a 30 percent lower risk of diabetes than those with the lowest blood levels (about 13 ng/mL).

What to do: To play it safe, take the recommended amounts of vitamin D: 600 IU a day for adults 70 or younger and 800 IU a day for people over 70. 🍊

Diabetes Care 35: 565, 2012.



BEST-MEX

BY KATE SHERWOOD

Here are three dishes that are inspired by the flavors of Mexico. Cilantro and lime make a mild fish sparkle, spicy chipotle mellowed by sweet orange juice makes chicken smoky and succulent, and fresh corn, crunchy tortilla chips, and crisp white onion make black beans irresistible. 🌶️

Got a question or suggestion? Write to Kate at healthycook@cspinet.org.

Tilapia with Cilantro-Lime Sauce

Total Time: 30 minutes 

- 1 large avocado
- 1 cup cilantro, chopped
- 3 Tbs. lime juice
- ¾ tsp. kosher salt, divided
- 4 tilapia fillets (about 1¼ lbs.)
- Freshly ground black pepper
- 1 Tbs. extra-virgin olive oil
- 4 cups finely shredded romaine
- ½ pint cherry tomatoes, sliced
- 2 scallions, sliced
- 4 oz. tortilla chips

Tilapia is a mild-flavored, white-fleshed, farmed fish. Domestic tilapia is the most environmentally friendly. A good alternative is tilapia from Latin America. Avoid tilapia from Asia.

Combine the avocado, cilantro, lime juice, and ½ tsp. of the salt in a small food processor. Blend until smooth. • Season the tilapia well with pepper and the remaining ¼ tsp. of salt. Sauté in a non-stick pan in the oil until lightly golden on one side, about 3 minutes. Gently turn the fish over and sauté until just cooked, 2-3 minutes. • Divide the lettuce and fish among four plates. Top with the avocado mixture and garnish with the tomatoes, scallions, and chips. • Serves 4.

Per Serving : Calories 410; Total Fat 20 g; Sat Fat 2.5 g; Protein 31 g; Carbs 28 g; Fiber 8 g; Cholesterol 70 mg; Sodium 450 mg

Chipotle Chicken Lettuce Wraps

Total Time: 20 minutes 

- 1¼ lbs. boneless, skinless chicken breast
- 1 Tbs. extra-virgin olive oil
- 5 cloves garlic, minced
- ½ chipotle pepper in adobo sauce (more to taste), minced
- 1 cup orange juice
- ¾ tsp. kosher salt
- 16 Boston (or Bibb) lettuce leaves
- 4 oz. tortilla chips, broken up
- 3 scallions, sliced

Not a fan of finger food? Arrange the lettuce on four plates, top with the chicken, and garnish with the scallions and chips.

In a large non-stick pan, sauté the chicken in the oil until browned on both sides, about 3 minutes per side. The chicken will not be fully cooked, so remove it to a dedicated cutting board. • Add the garlic and chipotle to the pan and sauté for 30 seconds, then stir in the orange juice and salt. Simmer until slightly thickened, about 3 minutes. • Cut the chicken across the width into ½" slices and return them to the pan. Toss to coat with the sauce and cook through, 2-3 minutes. • Stack the lettuce leaves on a plate. Serve the chicken, scallions, and chips in bowls. To assemble, spoon a small amount of the chicken, scallions, and chips into a leaf of lettuce and wrap. • Serves 4.

Per Serving : Calories 400; Total Fat 18 g; Sat Fat 2.5 g; Protein 32 g; Carbs 27 g; Fiber 3 g; Cholesterol 80 mg; Sodium 460 mg

Black Bean Fiesta

Total Time: 25 minutes 

- 1 white onion, diced, divided
- ½ pint cherry tomatoes, chopped
- ¾ cup crumbled queso fresco
- 1 cup fresh corn kernels
- 3 Tbs. lime juice
- 1 red bell pepper, diced
- 1 Tbs. extra-virgin olive oil
- 2 15 oz. cans no-salt-added black beans, drained and rinsed
- ¾ tsp. kosher salt
- 4 oz. tortilla chips
- 1 lime, cut into wedges

Queso fresco is a fresh white cheese that should be available in most supermarkets. If you can't find it, you can use feta. For extra zing, add a few drops of hot sauce at the table.

In a large bowl, toss together half the onion with the tomato, cheese, corn, and lime juice. Set aside • In a large skillet, sauté the remaining onion and the bell pepper in the oil until lightly browned, 2-3 minutes. Stir in the beans and sauté for another minute. • Add the contents of the skillet to the large bowl, mix all the ingredients together, and season with salt. Serve with chips and lime wedges. • Serves 4.

Per Serving : Calories 440; Total Fat 15 g; Sat Fat 3.5 g; Protein 20 g; Carbs 59 g; Fiber 14 g; Cholesterol 15 mg; Sodium 460 mg

Cereal Solutions

How to Decode Claims that Confuse

BY JAYNE HURLEY & BONNIE LIEBMAN

What to Look For

1. Whole grain. Wouldn't it be handy if cereals told you what percent of their grain was whole? Instead, most labels disclose *grams* of whole grain per serving.

That can be confusing because some cereals are low in whole grain because they're high in refined grains or sugar (that's bad). But other cereals are low in whole grain because they're high in bran (which doesn't count as a whole grain, according to labeling rules, but which should) or fruit, nuts, or soy (that's good).

For example, Kellogg's Raisin Bran is only about half whole grain. Kellogg's Original All-Bran has no whole grain. Both earned Best Bites.

That's why we relied on the ingredient list. Our Best Bites have little or no refined grain *or* the first two ingredients are whole grain, bran, fruit, or soy. (If the ingredient list didn't call a grain "whole" and the cereal maker wouldn't tell us, we assumed it was refined.)

2. No more than 250 calories per cup. Many people check a cereal's calories per serving. What they may *not* notice is that a serving varies from ¼ cup to 1¼ cups. So the 220 calories in a half-cup serving of, say, Familia Swiss Muesli Original Recipe, balloons to 440 calories if you eat a cup.

Our Best Bites have no more than 250 calories per cup because we figure that most people eat at least that much. Don't worry. We did the math for you. (See our chart, which begins on p. 14.) If you typically eat less than a cup—or if you want

Sometimes, it seems like cereal makers are *trying* to confuse us.

Are you better off with "More whole grain than any other ingredient!" or "Excellent source of fiber & made with whole grain"? Do you want a cereal that says "Can help lower cholesterol" or one that offers "More for your heart"?

Should you go for a cereal that promises to "Drop a jean size in 2 weeks!" or one that will help you "Stay fuller longer"? Is a cereal that promises "Long-lasting energy" the same as one that can "Help release energy from food"?

Here's our cereal claims decoder and five-step guide to what matters in the cereal aisle.

The information for this article was compiled by Emily Caras.

more than 250 calories' worth of cereal (plus 50 calories for each half cup of low-fat milk you use) to hold you over until lunch—you can ignore calories per cup.

3. Rich in fiber. Our Best Bites have at least 3 grams of fiber (light cereals) or at least 6 grams of fiber (heavy cereals). (A light cereal weighs roughly 1 oz., or about 30 grams, according to the Nutrition Facts label. A heavy cereal weighs about 2 oz., or around 55 grams.) But there's a catch.

So far, the evidence that fiber helps prevent heart disease and diabetes comes from studies where people ate *intact* fiber. That's the fiber that's inside whole grains (or bran). And intact wheat bran is best for regularity.

These days, many cereals are pumped up with "isolated fibers" like inulin, oat fiber, corn fiber, and wheat fiber. They're

largely fiber that has been removed from the grain and purified into a powder. It's not clear if they're good for anything.

So why did we count them? Because most cereals that have isolated fiber also have intact fiber, and you can't tell from the ingredient list how much of each they contain. (We even ranked by fiber in our chart because, although it's an imperfect measure, it does tend to highlight the better cereals.)

The bottom line: Look for at least 3 grams of fiber in a light cereal or 6 grams in a heavy cereal. But don't assume that more is better. Unless the cereal is mostly bran, "more" may just mean more isolated fiber.

4. Not loaded with added sugars.

When it comes to added sugars, less is better. But we couldn't limit sugar because Nutrition Facts labels don't distinguish between naturally occurring sugar in fruit (like raisins) and added sugars like evaporated cane juice, brown rice syrup, honey, brown sugar, molasses, luo han fruit concentrate, and high-fructose corn syrup.

We found just one cereal—General Mills Fiber One Original—that uses the questionable low-calorie sweetener aspartame. Others that cut some sugar use safe sucralose.

5. Low in sodium. Post or Kellogg's Raisin Bran has 250 milligrams of sodium per cup. Erewhon's, Trader Joe's, and Whole Foods 365 Organic's Raisin Brans have 120 mg. So always check the label.

Those are the basics. For help in decoding claims on cereal labels, read on.

Photos: Emily Caras/CSPi (bottom left), Jorge Bach/CSPi (all others).



The best fiber. Add fresh fruit for fewer calories than a raisin bran.



Fewer calories than other GOLEANS, plus 13 grams of protein.



Whole grain, real chocolate, and not too sweet. Mmmm.



Half the sodium of Kellogg's or Post Raisin Bran.



Like sweet cereal? This Fiber One uses sucralose to cut calories and sugar.

Whole Grain Guessing Game



Is 19 grams of whole grain good? Depends.

that in roughly half of those cereals, the second grain ingredient (usually corn meal) is refined.

■ **“Made with whole grain.”** Kellogg now uses this claim, along with “Good” (or “Excellent”) “source of fiber.” As always, “made with” can mean “made with very little.” Check the ingredients to see if the cereal has little or no refined grain or at least its first two grains are whole. Hint: Unless the word “whole” comes before the name of a grain, assume it’s not. Exceptions: rolled oats, rolled wheat, and brown rice are always whole. Rice, rice flour, corn, milled corn, corn meal, corn flour, wheat, and wheat flour typically aren’t.

■ **“20 g whole grain.”** Most cereal boxes disclose the amount of whole grain in a serving (see photo above). Check the Nutrition Facts label to see how that stacks up against the serving size. If they’re almost the same, the cereal is close to 100 percent whole grain. But if a 55-gram-per-serving cereal has, say, 20 grams of whole grain, that could either be bad (if the cereal is full of sugar and refined grains) or good (if the cereal has a lot of bran, fruit, or soy).

Here’s how to see through confusing whole grain claims:

■ **“Made from 100% whole grain.”** That’s the one you’re looking for. (Exception: A bran cereal can’t call itself 100% whole grain. But bran cereals are as good or better, because they can help keep you regular and may lower your risk of heart disease and diabetes.)

■ **“More whole grain than any other ingredient!” “With whole grain first ingredient.”** These claims are on all General Mills Big G cereals. Just remember

Lose Pounds?

Can cereals help you lose weight? Here’s the scoop on some claims:

■ **“Drop a jean size in 2 weeks!”** says Kellogg’s Special K Low Fat Granola. With 190 calories in a small (half-cup) serving, it’s hard to see how. Other Special K cereals run about 100 calories per serving ($\frac{2}{3}$ cup to 1 cup), but only one variety—Protein Plus—earned a Best Bite.

■ **“More grains. Less you!”** promises Peanut Butter Multi Grain Cheerios. “People who choose more whole grain tend to weigh less than those who don’t.” Yes, but it’s not clear that whole grains *caused* them to weigh less. At least the Cheerios has just 110 calories per ($\frac{3}{4}$ -cup) serving.

■ **“Fiber helps you feel satisfied, which makes it easier to stick to a reduced calorie diet and lose weight without feeling as hungry,”** says the Fiber One 80 Calories cereal box. That may be true if you’re talking about a diet rich in high-fiber foods like fruits and vegetables. But a bowl of cereal that gets some of its fiber from inulin and modified wheat starch? Who knows?



With 380 calories per cup, it’s not exactly diet food.

Is It Real?

■ **Chocolate.** “Made with REAL CHOCOLATE!” shout Kellogg’s Krave cereal boxes. But the “chocolate flavored filling” has more sugar, soybean oil, and skim milk than cocoa or chocolate. If you want real chocolate, try our only chocolate Best Bite: Kellogg’s Chocolate Little Bites Frosted Mini-Wheats.

■ **Fruit.** Post Honey Bunches of Oats Fruit Blends Peach & Raspberry has more natural flavor than peach juice concentrate and more salt than raspberry powder. Kellogg’s FiberPlus Antioxidants Berry Yogurt Crunch has more salt than berries. And Kellogg’s Strawberry Delight Bite Size Frosted Mini-Wheats uses a concoction of red 40, blue 2, blue 1, oil, and gelatin as a stand-in for strawberries. (What a delight!)

Cereals with real fruit—like raisin bran—have around 200 calories per cup (some granolas with fruit can hit 500 calories). You can cut calories by taking one of our Best Bite cereals that has no dried fruit and adding your own berries, kiwi, or other *fresh* fruit.

■ **Yogurt.** Special K Fruit & Yogurt’s “yogurt-coated clusters” are just sugar, oil, and heat-treated yogurt powder. And the “fruit” is tiny bits of dried apple colored with red and blue food dyes to look like berries.



More salt than raspberry powder.

Fee, Fi, Faux, Fiber

You’ll find them in Kellogg’s Corn Pops, Froot Loops, FiberPlus Antioxidants, and most varieties of Special K. They’re in General Mills Fiber One and Cinnamon Burst Cheerios. They’re in Whole Foods 365 Protein & Fiber Crunch.

In fact, we found dozens of cereals with added *isolated* fibers like inulin (chicory root fiber), soy fiber, oat fiber, soluble corn fiber, and soluble wheat fiber.

So far, the evidence that fiber can lower the risk of heart disease, diabetes, and constipation comes from foods rich in *intact* fiber. That’s the fiber in the bran (outer) layer of whole grains. Yet Nutrition Facts labels count all fibers as equal.

What to do? Be skeptical of claims like “40% of your daily fiber.” Check the ingredient list. Look for cereals that are rich in fiber from whole grains, and especially from *wheat* bran.

Exceptions: The psyllium in All-Bran Bran Buds helps lower cholesterol and promotes regularity. (It’s also in Metamucil.) And cereals with enough soluble fiber from oats can claim to “help lower cholesterol,” but you’d have to eat four servings a day of many of them to lower your cholesterol by just 3 percent.



Most of its “40% of your daily fiber” is isolated fiber.



Heart Marketing

Cereal boxes are plastered with hearts. But they don't all deserve to be there. Nor do all heart claims.

■ **Low in saturated fat.** "May reduce the risk of heart disease," boasts Chocolate Cheerios. Kellogg's "Heart Healthy Selection" symbol says the same thing in small print.

Any food that's low in saturated fat and cholesterol (and not high in sodium) can make that

See a heart? It may just mean "low in sat fat."

government-approved health claim. But that includes most cereals, so it's nothing special.

■ **Soluble fiber.** "Three grams of soluble fiber daily from whole grain oat foods...may reduce the risk of heart disease," says the yellow box of Cheerios. Soluble fiber also explains why Quaker Whole Hearts claims to "help lower cholesterol." Here's the fine print: An oat cereal can make that claim if it has just three-quarters of a gram of soluble fiber per serving. You'd need 4 servings a day to lower your cholesterol by just 3 percent. Not exactly a statin drug.

Kellogg now adds "soluble corn fiber" to its FiberPlus Antioxidant cereals and "soluble wheat fiber" to most of its Special K cereals. Do they lower cholesterol? No one knows.

■ **Antioxidants.** Antioxidants like vitamins C and E don't lower heart disease risk. Yet Kellogg's Smart Start and Fiber-Plus Antioxidants each calls itself a "Heart Healthy Selection." The company must be laughing all the way to the bank.

Energy = Calories

"100% natural energy cereal," proclaims Bear Naked's new Honey Almond Nut Cluster Crunch. "Energize your day," urges Quaker Honey Nut Oatmeal Squares.

The Wheaties Fuel Web site promises complex carbs ("Fuel for physical activity"), B vitamins (to "Help release energy from food"), and whole grains ("For long-lasting energy").

That's all a bunch of bunk. Every cereal provides energy, because (on food labels) "energy" simply means "calories." (One cup of Bear Naked Honey Almond Nut Cluster Crunch is packed with 240 calories. We're guessing "100% natural high-calorie cereal" might not sell too well.)

And B vitamins won't make you feel more energetic. (If you couldn't release energy from your food, you'd be dead.)

Do people feel more energetic after eating whole grains? No one's looked. But Wheaties Fuel has chutzpah to boast about it, given that it's not 100 percent whole grain. *Original Wheaties is...and a bowlful will save you about 100 calories.*



Any cereal with calories has "energy."

BRAND-NAME RATING

Cereality Check

Our **Best Bites** (✓✓) meet 4 criteria:

1. Little or no refined grains OR the first 2 ingredients are whole grain, bran, fruit, or soy.
2. No more than 250 calories per cup.
3. At least 3 grams of fiber for lighter cereals (a serving weighs about 1 oz., or 30 grams) or at least 6 grams of fiber for heavier cereals (a serving weighs about 2 oz., or 55 grams).
4. No questionable artificial sweetener aspartame.

Within each section, cereals are ranked from most to least fiber, then least to most calories per cup. The numbers in those two columns are in **green**.

	Calories	Calories Per cup	Fiber (g)	Sugar (tsp.)
LIGHTER CEREALS (19-35 grams per serving)				
General Mills Fiber One Original (½ cup)	60	120	14*	0 ^A
✓✓ Nature's Path Organic Smart Bran (½ cup)	80	160	13*	1.5
✓✓ Kellogg's All-Bran Bran Buds (½ cup)	70	210	13*	2
✓✓ General Mills Fiber One 80 Calories (¾ cup)	80	110	10*	1
✓✓ Kellogg's All-Bran Original (½ cup)	80	160	10	1.5
✓✓ Kellogg's FiberPlus Antioxidants Cinnamon Oat Crunch (¾ cup)	110	150	9*	2
✓✓ Newman's Own Sweet Enough Cinnamon Fiber Flakes (¾ cup)	90	120	8*	1.5
✓✓ Quaker Life Crunchtime (¾ cup) ¹	110	150	6*	1.5
General Mills Cinnamon Burst Cheerios (1 cup)	110	110	5*	2.5
✓✓ Kellogg's All-Bran Complete Wheat Flakes (¾ cup)	90	120	5	1.5
✓✓ Kashi Berry Blossoms (¾ cup)	100	130	5*	2
✓✓ Kashi Honey Sunshine (¾ cup)	100	130	5*	1.5
✓✓ Kellogg's Special K Protein Plus (¾ cup)	100	130	5	0.5
✓✓ Post Bran Flakes (¾ cup)	100	130	5	1.5
✓✓ Trader Joe's Bran Flakes (¾ cup)	100	130	5	1.5
✓✓ Nature's Path Organic Flax Plus Multigrain Flakes (¾ cup)	110	150	5	1
✓✓ Nature's Path Organic Heritage Bites (¾ cup)	110	150	5	1
✓✓ Nature's Path Organic Multigrain Oatbran (¾ cup)	110	150	5	1
✓✓ Whole Foods 365 Organic Bran Flakes (¾ cup)	110	150	5	0.5
✓✓ Kashi Heart to Heart, Honey Toasted Oat or Warm Cinnamon Oat (¾ cup) ¹	120	160	5*	1.5
✓✓ Nature's Path Organic Heritage Flakes (¾ cup)	120	160	5	1
✓✓ Newman's Own Sweet Enough Honey Flax Flakes (¾ cup)	100	130	4	2
✓✓ Weetabix Whole Grain Biscuit (2 biscuits)	130	130	4	0.5
✓✓ Whole Foods 365 Organic Whole Wheat Flakes (¾ cup)	100	130	4	1.5
✓✓ Weetabix Organic Crispy Flakes (¾ cup)	110	150	4	1
✓✓ Nature's Path Organic Flax Plus Cinnamon (¾ cup)	120	160	4	1.5
✓✓ General Mills Cheerios (1 cup)	100	100	3	0.5
✓✓ Cascadian Farm Organic Honey Nut O's (1 cup)	110	110	3	2
✓✓ Cascadian Farm Organic Purely O's (1 cup)	110	110	3	0.5
✓✓ General Mills Multi Grain Cheerios (1 cup)	110	110	3	1.5
Kellogg's Corn Pops or Froot Loops (1 cup) ¹	120	120	3*	3
✓✓ Arrowhead Mills Organic Flakes—Amaranth, Oat Bran, or Spelt (1 cup) ¹	130	130	3	1
✓✓ General Mills Total Whole Grain (¾ cup)	100	130	3	1.5
✓✓ General Mills Wheaties (¾ cup)	100	130	3	1
Kellogg's Special K, except Original or Protein Plus (½-1 cup) ¹	110	150	3*	2

	Calories	Calories Per cup	Fiber (g)	Sugar (tsp.)
✓✓ Post Grape-Nuts Flakes (¾ cup)	110	150	3	1
✓✓ Quaker Whole Hearts (¾ cup)	110	150	3*	1.5
✓✓ Trader Joe's Toasted Oatmeal Flakes (¾ cup)	110	150	3	2
✓✓ Trader Joe's Triple Berry-O's (¾ cup)	110	150	3*	2
✓✓ Whole Foods 365 Organic Wheat Waffles (¾ cup)	110	150	3	1.5
✓✓ Kellogg's Krave (¾ cup) ¹	120	160	3*	2.5
✓✓ Mother's Toasted Oat Bran (¾ cup)	120	160	3	1.5
✓✓ Nature's Path Organic Heritage O's (¾ cup)	120	160	3	1
✓✓ Nature's Path Organic Millet Rice (¾ cup)	120	160	3	1
General Mills Cheerios, except Cinnamon Burst, Multi Grain, or original (¾ cup) ¹	110	150	2	2
Post Honey Bunches of Oats Honey Roasted (¾ cup)	120	160	2	1.5
Quaker Life (¾ cup) ¹	120	160	2	2
General Mills Cinnamon Toast Crunch (¾ cup)	130	170	2*	2.5
Kashi 7 Whole Grain Puffs (1 cup)	70	70	1	0
Kellogg's Corn Flakes (1 cup)	100	100	1	1
Post Honey Bunches of Oats Fruit Blends (¾ cup) ¹	120	160	1	1.5
Kellogg's Special K Original (1 cup)	120	120	0	1

HEAVIER CEREALS (47-62 grams per serving)

✓✓ General Mills Fiber One Honey Clusters (1 cup)	160	160	13*	1.5
✓✓ Kashi Good Friends (1 cup)	160	160	12*	2.5
✓✓ Weetabix Organic Crispy Flakes & Fiber (1¼ cups)	170	140	11*	2.5
✓✓ General Mills Fiber One Raisin Bran Clusters (1 cup)	170	170	11*	3.5
✓✓ Barbara's Bakery High Fiber (1 cup) ¹	190	190	11*	2.5
✓✓ Kashi GOLEAN (1 cup)	140	140	10*	1.5
✓✓ Kellogg's FiberPlus Antioxidants Berry Yogurt Crunch (1 cup)	170	170	10*	3
✓✓ Whole Foods 365 Protein & Fiber (1 cup)	190	190	10*	1.5
✓✓ Uncle Sam Original (¾ cup)	190	250	10	0
✓✓ Trader Joe's Organic High Fiber O's (1¼ cups)	190	150	9*	2.5
✓✓ Post Wheat'n Bran Shredded Wheat Spoon Size (1¼ cups)	200	160	9	0
✓✓ Whole Foods 365 High Fiber Morning O's (1 cup)	170	170	9*	2.5
✓✓ General Mills Fiber One, Caramel Delight or Frosted Shredded Wheat (1 cup) ¹	190	190	9*	3
✓✓ Trader Joe's Organic Raisin Bran Clusters (1 cup)	190	190	9*	4.5
✓✓ Kellogg's FiberPlus Antioxidants Caramel Pecan Crunch (¾ cup)	170	230	9*	3
✓✓ Cascadian Farm Organic Hearty Morning Fiber (¾ cup)	190	250	9*	2.5
✓✓ Kashi GOLEAN Crisp! (¾ cup) ¹	190	250	9*	2.5
✓✓ Nature's Path Organic Optimum Power Blueberry Cinnamon Flax (¾ cup)	200	270	9*	2.5
✓✓ Kashi Good Friends Cinna-Raisin (1 cup)	160	160	8*	3.5
✓✓ Trader Joe's Raisin Bran (1 cup)	170	170	8	4
✓✓ Post Raisin Bran (1 cup)	190	190	8	5
✓✓ Whole Foods 365 Protein & Fiber Crunch (1 cup)	190	190	8*	3
✓✓ Kashi GOLEAN Crunch! (1 cup) ¹	200	200	8*	3
✓✓ General Mills Wheaties Fuel (¾ cup)	190	250	8*	3.5
✓✓ Nature's Path Organic Flax Plus Raisin Bran (¾ cup)	190	250	8	3
✓✓ Nature's Path Organic Optimum Cranberry Ginger (¾ cup)	190	250	8*	3.5
✓✓ Bob's Red Mill Muesli (½ cup)	220	440	8	2.5
✓✓ Kellogg's Raisin Bran (1 cup)	190	190	7	4.5
✓✓ Alpen Apple Spice Muesli (1 cup)	210	210	7	2
✓✓ Post Selects Great Grains Banana Nut Crunch (1 cup)	240	240	7	3
✓✓ Back to Nature Granola, Cranberry Pecan or Vanilla Almond Agave (½ cup) ¹	190	380	7*	3

	Calories	Calories Per cup	Fiber (g)	Sugar (tsp.)
Post Grape-Nuts (½ cup)	200	400	7	1.5
Kashi 7 Whole Grain Nuggets (½ cup)	210	420	7	1
✓✓ Post (or other brands) Original Shredded Wheat (2 biscuits) or Spoon Size (1 cup) ¹	170	170	6	0
✓✓ Quaker Toasted Multigrain Crisps (1¼ cups)	210	170	6	2.5
✓✓ Erewhon Raisin Bran (1 cup)	180	180	6	2
✓✓ Whole Foods 365 Organic Raisin Bran (1 cup)	180	180	6	4
✓✓ Cascadian Farm Organic Raisin Bran (1 cup)	190	190	6*	4
✓✓ Kellogg's Frosted Mini-Wheats Bite Size (21-25 biscuits) ¹	190	190	6	3
✓✓ Kellogg's Frosted Mini-Wheats Little Bites (42-52 biscuits) ¹	190	190	6	3
✓✓ Kellogg's Frosted Mini-Wheats Touch of Fruit in the Middle (24 biscuits) ¹	190	190	6	2.5
✓✓ Nature's Path Organic Optimum Slim Low Fat Vanilla (1 cup)	200	200	6*	1.5
✓✓ Post Lightly Frosted Shredded Wheat Spoon Size (1 cup)	200	200	6	3
✓✓ General Mills Multi-Bran Chex (¾ cup)	160	210	6	2.5
✓✓ General Mills Wheat Chex (¾ cup)	160	210	6	1.5
✓✓ Post Honey Nut Shredded Wheat Spoon Size (1 cup)	220	220	6	3
✓✓ Kashi Island Vanilla (27 biscuits)	190	250	6	2.5
✓✓ Nature's Path Organic Flax Plus Crunch (¾ cup) ¹	210	280	6	3
✓✓ Nature's Path Organic Heritage Crunch (¾ cup)	230	310	6*	1.5
✓✓ Bear Naked Peak Protein The Original (½ cup)	280	560	6	3
✓✓ Quaker Oatmeal Squares (1 cup) ¹	210	210	5	2.5
✓✓ General Mills Oatmeal Crisp (1 cup) ¹	230	230	5	4.5
✓✓ Post Selects Great Grains, except Banana Nut Crunch (¾ cup) ¹	200	270	5	3
✓✓ Kellogg's Müeslix (⅔ cup)	200	300	5	3.5
✓✓ Alpen Original Muesli (⅔ cup)	210	320	5	3
✓✓ Quaker Natural Granola Lowfat (⅔ cup)	210	320	5*	3.5
✓✓ Kellogg's Special K Low Fat Granola (½ cup)	190	380	5*	2.5
✓✓ Quaker Natural Granola, except Lowfat (½ cup) ¹	200	400	5*	3
✓✓ Bear Naked Fit Granola (½ cup) ¹	240	480	5	2
✓✓ Kellogg's Raisin Bran Crunch (1 cup)	190	190	4*	5
✓✓ General Mills Basic 4 (1 cup)	200	200	4	3.5
✓✓ Bear Naked Nut Cluster Crunch (¾-1 cup) ¹	200	230	4	3
✓✓ Post Selects Maple Pecan Crunch (¾ cup)	210	280	4	3
✓✓ Familia Swiss Balance Premium Müesli (⅔ cup)	210	320	4	1
✓✓ Nature's Path Organic Granola (¾ cup) ¹	250	330	4*	2.5
✓✓ Kellogg's Low Fat Granola With Raisins (⅔ cup)	230	350	4*	4.5
✓✓ Post Honey Bunches of Oats Just Bunches! Honey Roasted (⅔ cup)	250	380	4	3.5
✓✓ Back to Nature Granola, except Cranberry Pecan or Vanilla Almond Agave (½ cup) ¹	210	420	4	3
✓✓ Familia Swiss Müesli Original Recipe (½ cup)	220	440	4	3.5
✓✓ Bear Naked Granola (½ cup) ¹	270	540	4	3
✓✓ Nature's Path Organic Love Crunch (½ cup) ¹	280	560	4	3.5
✓✓ Kellogg's Smart Start (1 cup)	180	180	3*	3.5
✓✓ Cascadian Farm Organic Oats and Honey Granola (⅔ cup)	230	350	3*	3.5
✓✓ Kellogg's Original Low Fat Granola (½ cup)	190	380	3*	3.5

✓✓ Best Bite. ¹Average. *Includes added isolated fiber.

^A Contains aspartame.

Daily Recommendations (for a 2,000-calorie diet): **Fiber:** at least 25 grams. **Sugar:** no more than 25 grams (6½ teaspoons).

Source: company information. The use of information from this article for commercial purposes is strictly prohibited without written permission from CSPI.

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RIGHT STUFF

PEPPER PICK



Looking for a snack to bring to the office or on a long car ride? You've got baby carrots, grape tomatoes, sugar snap peas, or any fruit in season.

If you're hankering for something a little different, pick up a bag of **mini sweet peppers**.

A serving (about three peppers) delivers just 30 calories, but packs a third of a day's vitamin A and nearly three days' worth of vitamin C. And

mini peppers have so few seeds, you probably won't even notice them.

The downside? They're probably not organic. At least the two brands we found—**Wilson Produce** (mostly in the Midwest and West) and **Pero Family Farms** (mostly east of the Mississippi)—weren't. (Pero does sell organic mini peppers, but they're not widely distributed.) If you can find bags of organic mini peppers from another company or loose at a store or (better yet) farmers market, by all means buy them.

But if that's not going to happen, plunking down \$5 for a two-pound bag of more than 30 mini peppers is a smart move.

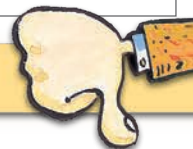
Of course, you don't have to eat them unadorned. Try a quick dip in some hummus or tzatziki. Or build a salad by tossing together sliced mini peppers, tomatoes, cucumber, and diced red onion. Or chop and add to a stir-fry or a grain or bean dish like tabouli, pilaf, bean salsa, or lentil salad. Then there's roasting or grilling.

But the real beauty of mini sweet peppers is that you can pop one in your mouth whole. If you can find a tastier, more filling 10-calorie snack, let us know.

Pero Family Farms: (561) 498-4533

Wilson Produce: (520) 375-5755

Photos: Pero Family Farms (left), Jorge Bach/CSPI (right).



FOOD PORN

KILLER CARBONARA?

"Blending 20 years of tradition with innovative Italian cooking," says **Romano's Macaroni Grill's** Web site. "Something New. Something Classic."

That seems to explain the chain's **Carbonara**. The Grill's chefs took a classic carbonara—spaghetti, Italian bacon, Parmesan—and (drumroll) slapped a poached egg on top. What could be more innovative?

Your "something new" brings 1,260 calories to store in your new fat cells, and sends 29 grams of saturated fat (1½ days' worth) and 3,640 milligrams of sodium (a two-day supply) straight to your arteries. It's like eating two Big Macs plus a scoop of Häagen-Dazs Chocolate ice cream. And that doesn't include the Peasant Bread (480 calories and 2,150 mg of sodium) and dipping olive oil (120 calories per tablespoon) that show up on your table before the entrée arrives.

Macaroni Grill does offer a "Lite" menu of six entrées with less than 600 calories. Well, let's hope it does. The carbs are largely gone, but if the samples we examined at a Washington, DC-area Macaroni Grill are typical, odds are that the Grilled Shrimp Spiedini and Warm

Spinach & Shrimp have well over the 380 or 340 calories listed on the company's Web site. Your best bet: the Pan-Seared Branzino (European sea bass), which looks like it could actually clock in at the promised 570 calories.

"Never intimidating and always comfortable, Macaroni Grill delivers an experience that is perfect to celebrate your big day or every day," says the Web site.

Comfortable? Only if you wear something that leaves room for your new carbonara.

Romano's Macaroni Grill: (972) 674-4300



dish OF THE MONTH

Berry Yogurt Bliss

Whisk together 1 tsp. of vanilla, 1 Tbs. of sugar, 2 Tbs. of orange juice, and 6 oz. (¾ cup) of unflavored nonfat Greek yogurt. Divide 2 pints of mixed berries among four dessert bowls and top each with a quarter of the yogurt mix.