special report
THE INSULIN THREAT

Top researchers now agree that carbs, like fats, come in good and bad varieties. The worst ones flood your body with glucose and insulin, boosting your risk for several serious diseases. It's news that will revolutionize the way you eat. So why haven't you heard about it from your doctor?

ARE YOU EATING
the Right Carbohydrates?

At an office in Chicago Heights, Illinois, a group of nurses gather every afternoon for a three o'clock break. The women used to take turns bringing in cookies and other sweets, but lately they've been snacking on premade whipped dessert topping. Like Indians with a peace pipe or stoners with a bong, they pass the can in a circle, squirting hits into their mouths and savoring the creamy treat—which is almost entirely fat, with just a trace of evil carbohydrates.

Hello! That's what dietitian Christine Beebe thought when she heard about this unorthodox snack pack. Beebe, who has an office in the nurses' building, is a spokesperson for the American Diabetes Association. She's a firm believer that just about anyone will benefit from

By Timothy Gower    Illustrations by Brian Cronin

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following the current nutrition recommendations of most U.S. public health organizations: Cut back on fat and eat more carbohydrates. But in recent years she’s found growing resistance to that advice. “People are afraid to eat carbs,” says Beebe, wryly. She has clients who’ve quit eating bread, potatoes, and other starchy foods because—the prevailing wisdom goes—they make you fat.

This new carbophobia can be traced to the many high-protein, fat-friendly diet books that crowd best-seller lists: Dr. Atkins’ New Diet Revolution, The Zone, and Sugar Busters!, to name just a few. Even actress Suzanne Somers has gotten into the act. Armed with lofty credentials (remember, she was a spokesperson for the amazing Thighmaster), the former star of “Three’s Company” has written a pair of bestselling diet guides warning readers that certain carbohydrates are “funky foods” that must be “eliminated altogether.”

The popularity of books like these has frustrated doctors and dietitians alike. Their chief gripe is that there simply is no scientific evidence to back the authors’ claims.

But a funny thing has happened. A growing body of solid studies has begun to suggest that some of the purportedly harebrained notions touted in The Zone and its kind may warrant closer attention. For instance, some investigations strongly hint that eating a diet rich in certain carbohydrates can lead to adult-onset diabetes and heart disease. One study even implies that regular indulgence in the wrong types of carbs will leave you chronically hungry, setting the stage for weight problems (see “Are the Low-Carb Diet Books Right?” page 136).

In the last few years, the World Health Organization, along with nutrition experts in Canada, Australia, and Europe, has embraced the notion that all carbohydrates are not created equal and that some very popular ones should be eaten in moderation. But don’t bother asking your doctor for advice on this issue. Few U.S. health officials have shown much interest in the good-carb, bad-carb concept; in fact, many condemn it as simply too darned confusing. But as the clash of philosophies has snowballed into a full-blown controversy, more and more Americans find themselves wondering: Is it okay to eat mashed potatoes? And do I really need to cut back on my daily bread?

no one’s suggesting you fill up on candy bars and soda pop. But some genuinely healthy foods, such as fruit, vegetables, and grains (bread, pasta, rice, and cereal), also are rich sources of carbohydrates in the form of starch or fiber.

In the 1970s, however, scientists began to notice something surprising about the way carbohydrates behave during digestion. Other than fiber, which your body can’t digest, all carbohydrates turn into glucose, a form of sugar, before they enter the bloodstream. For years scientists assumed that table sugar and other sugars in foods broke down faster than starch did. But researchers at the University of Toronto took a closer look and realized that some starchy foods, including white bread and potatoes, enter the bloodstream even faster than table sugar does.

In the early eighties, the Toronto group devised a system for ranking carbohydrates on a scale of one to 100 by how quickly they convert to glucose and raise blood sugar. Since then other labs have come up with their own versions of the so-called glycemic index, or GI. Many things influence how fast your body digests carbs, but generally speaking, whole grains and foods that contain lots of fiber rank low (fiber slows the rate at which glucose is absorbed). Meanwhile, starchy foods, especially those with little or no fiber, are absorbed rapidly, so they rank extremely high. Some potatoes, for instance, have a rating of 93, while fiber-rich beans run as low as 27.

Does all this sound like make-work for bored biochemists? Initially, the index was designed to help people with diabetes control their blood sugar levels, which when elevated place them at risk for blindness, kidney damage, and death. But scientists have since uncovered evidence that eating too many of the wrong kinds of carbs may actually cause some people to develop the disease in the first place.

In one case, researchers at the Harvard School of Public Health who studied the dietary habits of more than 65,000 female nurses found that women who ate little fiber and many high-glycemic carbs—especially potatoes, white bread, and white rice—were 2½ times more likely to develop diabetes than were women who ate these foods sparingly.

Then another Harvard scientist, epidemiologist Simin Liu, analyzed data from the nurses’ study and came to a startling conclusion: Women whose diets included the most high-glycemic carbs nearly doubled their risk of suffering a heart attack. In fact, Liu’s study showed that eating a lot of glucose-spiking carbs put a woman at greater risk than did any of the usual suspects, including saturated fat.

How do carbohydrates harm the heart? Several possibilities have emerged. One study of more than 1,400 middle-aged adults found that people who ate a lot of sweet, starchy
foods also had the lowest levels of HDL, or good cholesterol, a condition known to increase the risk of a heart attack. And according to Stanford University hormone expert Gerald Reaven, the problem isn't even glucose per se; it's a defect in the body's reaction to insulin, the hormone whose job it is to escort glucose from the bloodstream into the muscles and liver, where it's stored for later use.

Based on his research, Reaven believes that 25 to 30 percent of Americans are "insulin resistant." That means their bodies don't respond well to the hormone, so they need to pump out ever-increasing doses. Insulin resistance not only leads to diabetes, but according to Reaven, it's also the foundation of a metabolic condition known as Syndrome X, which may be responsible for up to 50 percent of all heart attacks. (For more about Syndrome X, see part one of "The Insulin Threat" in the March issue.)

The work of Reaven and others has captured the attention of international health authorities. In 1998 the United

A WHOLE

M any experts now agree that paying attention to the carbohydrates you eat is just as important as minding your meat and cheese. During digestion, carbs break down into glucose, a form of sugar. Research suggests that chronically elevated blood sugar ups your risk for heart disease, diabetes, and other conditions. Some researchers advise cutting carbs to less than half of your daily calories and adding back healthy fats, such as olive and canola oils. But most, like nutritionist Thomas Wolever, coauthor of The Glucose Revolution, say it's crucial to watch the kinds of carbohydrates you eat—whole grain and high-fiber ones are best—and what you eat with them. Here are tips for choosing and preparing some common foods.

Pick the right potatoes. Round red and white potatoes (62*), also known as new potatoes, have less starch than baking potatoes (85 to 93). Sweet potatoes (54) are a good alternative, too. Mashed potatoes raise blood sugar faster than whole. When serving baked potatoes, forgo sour cream and instead use olive oil, which is better for your heart. Besides, eating a starchy carb with some fat blunts the blood sugar hike.

Befriend the bean—and other legumes, too. They tend to be low on the glycemic index (most rank under 50) because they're packed with soluble fiber, which slows digestion and thus the rise in blood sugar.

Go for whole grain breads. Pumpernickel (51) and other loaves baked with whole kernels of grain are digested more slowly than white breads and whole wheat breads made with large amounts of white flour or finely ground whole wheat (both rank around 70). (The coarser the bread, the better; look for visible grains.) Try sourdough (52), too; its special yeast produces acids that moderate the blood sugar surge.

Choose long-grain rice. Most rice sold in the United States has a modest glycemic index (in the fifties), but short-grain and instant both rank quite high (72 and 87). So does the sticky rice commonly used in Asian cuisine.

Don't pass up pasta. Forget what you read in The Zone; dry pasta is not a high-glycemic carbohydrate (spaghetti: 41). Made from cracked wheat instead of wheat flour, it has large particles that take longer for digestive enzymes to break down, so it's absorbed more slowly than many refined grains. Look for "semolina" pastas made from durum wheat.

Shop for high-fiber cereal. Stick with bran cereals and other fiber-rich kinds, which rank in the forties or fifties. (Other varieties have GIs in the seventies and eighties.) Or try steel-cut or old-fashioned oatmeal (49). The instant variety, rolled and precooked, has a higher rating (66).

Eat lots of fruit and vegetables. Be sure to include plenty of low-GI fruit, such as apples, oranges, grapefruit, pears, peaches, grapes, and plums (all rank under 40). Most veggies have a low ranking; a salad splash with vinaigrette is a particularly good choice, since the acid in vinegar slows digestion.

Drink wine with dinner, if you like. Alcohol lowers blood glucose, though too much can drop it to dangerous levels. A drink or two a day is plenty. —T.C.

* Numbers indicate the foods' glycemic index rankings from one to 100; the lower the number, the less of a glucose surge your body endures.
Nations issued a report representing the views of the World Health Organization and the Food and Agriculture Organization. Among other things, the report emphasized the importance of adding low-glycemic carbohydrates to the diet.

"I went to the U.N. meeting with questions," says chemist and carbohydrate expert David Lineback. But after listening to Toronto’s Thomas Wolever, who coauthored a book called The Glucose Revolution, Lineback was sold. "I think the glycemic index is applicable in any culture," he says. Indeed, many groups around the world, including the Canadian Diabetes Association, Diabetes Australia, and the European Association for the Study of Diabetes, have incorporated it into their nutrition guidelines.

And people with diabetes aren’t the only folks who stand to benefit. Harvard’s Liu thinks anyone who is overweight and sedentary—that’s nearly 60 percent of people in this country—should be eating like a diabetic. True believers take it one step further, claiming we’d all be healthier if we just dined on the right kinds of carbohydrates. So why aren’t we? It’s simple. Many diet experts in the United States aren’t yet sold on the carbohydrate tip sheet.

"It’s a gimmick," says Anne Dubner, a Houston-based dietitian and spokesperson for the American Dietetic Association. Dubner admits that some people’s blood sugar climbs after eating certain foods. But in her experience, the

ARE THE DIET BOOKS RIGHT?

If you believe what you read in today’s best-selling diet books, bananas and bagels will plump you up faster than butter and bacon. Your body converts carbs—from fruit, vegetables, and grain—into glucose, which the hormone insulin sweeps from the blood into muscle cells and the liver. Load up on more than you need, and you store the excess as fat.

That much you could learn in a biology text. But the diet-book authors go on to say it’s not the added calories that make you fat; it’s the insulin itself. The only problem, critics insist, is that no scientific research supports this idea. If anything, the evidence points the other way: Insulin doesn’t make you fat; extra fat makes you produce more insulin.

Recently, however, a study suggested that insulin may indeed play a role in weight gain, though not for the reasons the anticarb crowd maintains. At Boston’s Children’s Hospital, obesity expert David Ludwig wanted to find out what kinds of meals leave people full the longest. One day he gave a group of overweight boys vegetable omelets and fruit for both breakfast and lunch. Another day the boys got instant oatmeal. Both times they were told to help themselves to sandwiches, cookies, and other treats whenever they felt “very hungry” later in the day.

The results were dramatic. The day oatmeal was served, the boys took in 81 percent more calories after lunch than they did when they ate the omelet and fruit. Why? Ludwig notes that instant oatmeal is a refined carbohydrate, which means it’s made up of processed grains that enter the bloodstream fast, triggering a greater rise of glucose and insulin than an egg meal would.

"I believe very high insulin causes nutrients to be stored too tightly, so the body has difficulty accessing fuel a few hours after a meal," Ludwig says. The brain, fooled into thinking fuel supplies are low, starts sending out hunger signals, and soon you’re craving more food.

Ludwig admits there’s still no proof this effect would persist and cause weight gain. What’s more, his belief that insulin provokes food cravings contradicts strong evidence from animal studies that insulin actually suppresses appetite.

As much as we’d all love to find a magic way to melt away pounds, the science of weight gain and loss remains frustratingly complex. But one truth has held steady over the years. Studies have shown that weight gain has little to do with the foods you choose; it’s how many calories you eat that matters. In other words, if you want to lose weight, you have to eat less. —r.a.
Which of these multivitamins has ALL its vitamins A, C and E in 100% antioxidant form?

rules of the glycemic index don’t always apply. “I’ve seen it disproved over and over,” she says. “People tell me they can eat all the potatoes in the world and it doesn’t affect their blood sugar.”

Dietitian Ann Coulston of Palo Alto, California, also has doubts. Coulston was part of a team at Stanford University in the 1980s that tested how the index stood up in normal eating situations. In a lab, GI rankings are determined by feeding people single foods and measuring how fast their glucose and insulin shoot up. But what happens, Coulston wondered, when you eat an entire meal, with carbohydrates, fat, and protein all hitting your digestive system at the same time?

She found that the standard glycemic tables didn’t consistently predict the actual change in subjects’ glucose levels. As a tool for choosing healthier foods, she says, the index appeared to have little value.

American experts have plenty of other quibbles. Among them concerns: It can be hard to peg the rating of certain foods. Take bananas. When they’re green, their glycemic index is 35; when they ripen, that number doubles. Potatoes range from 62 to 93 depending on their type, and the value for a single potato can rise 23 percent when it’s mashed. As for rice, many types of white rice have a high rating, but a few others don’t.

These quirks bother dietitian Marion Franz, who heads the nutrition guidelines committee for the American Diabetes Association. Franz says Americans already struggle to follow nutrition advice. “Why add another layer of complexity?” she asks. Even worse, Franz worries that people will misinterpret the message to mean they should never eat high-glycemic foods, even though many, such as carrots and beets, have well-established health benefits. Count the American Heart Association as skeptical, too. Nowhere does it advise people to seek out whole grains and high-fiber foods and eat fewer starchy, refined ones.

Thomas Wolever has heard it all before. He’s particularly disturbed by the claim that the glycemic index doesn’t hold up in real-life situations. When asked why the Stanford study flopped, he sheds any pretense of scientific diplomacy. “They did the numbers wrong,” he insists. Coulston used an incorrect glycemic ranking for potatoes, he says, which threw off her results. His coauthor, Jennie Brand-Miller, finds other design flaws troublesome. For one, the meals contained much more fat than most Americans eat; fat slows glucose’s entry into the bloodstream.

Whatever is true of Coulston’s analysis, Wolever maintains that nine out of ten studies around the world contradict it. Over and over, starchy, low-fiber foods have been shown to boost blood glucose levels more than unrefined grains and high-fiber fruit and vegetables do, even when they’re eaten as part of a meal. In one study Brand-Miller fed volunteers a half dozen typical meals—a rice-based Chinese dish one day, pasta with meat sauce the next, for instance. The meals all delivered the same amounts of carbohydrates, yet each one...
produced a marked change in the subjects' blood glucose levels. Steak and mashed potatoes sent glucose soaring about 65 percent higher than did a Greek-style lentil stew.

Brand-Miller also pooh-poohs the idea that the glycemic index is difficult to use. Although The Glucose Revolution includes a daunting list with the ratings for several hundred foods, Brand-Miller says it's not necessary to obsess over numbers. "We're saying you should emphasize low-glycemic foods and eat high-glycemic foods in smaller portions," she explains. "I don't think you need tables and charts to do that."

Instead, she suggests adopting a "this for that" approach. In other words, it's okay to have potatoes, just not every night; now and then serve pasta, which has a much lower rating. Swap your high-GI white and whole wheat bread for lower-GI whole grain bread. (Many breads labeled "whole wheat" don't actually pack much fiber.) Eat more beans and other legumes. Far from nixing favorite foods, Brand-Miller says, these changes actually expand your dining options (see "A Whole New Way to Eat," page 135).

Given such reasonable advice, it seems bizarre that scientists are snarling at one another over the validity of the glycemic index. Wolaver senses a brand of nationalism among detractors. "Maybe it's because it's not 'made in America,'" he points out, noting that most of the research has been done in Canada and Australia.

But even here things are beginning to change. Certainly, the health benefits of whole grains have been firmly established; every cereal or bread that contains them proudly proclaims that fact on its label. And although you won't see many references to the glycemic index, hints are starting to turn up in public health statements. The new edition of the government's Dietary Guidelines for Americans, scheduled for release this year, urges people to "choose a variety of grains daily, especially whole grains."

Will you soon hear the surgeon general declare that cutting back on potatoes, white bread, and other starchy goodies will do as much for your health as easing up on cheeseburgers and ice cream? Maybe not. But that doesn't mean you have to sit quietly and wait. If Wolaver and his like-minded colleagues turn out to be right—and it's starting to look as if they could be—mingling your carbohydrates may prove to be the best idea since sliced bread.

Timothy Gower is a contributing editor.