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GLUTEN: The Whole Story

Gluten troubles were once thought to be a problem primarily for those with celiac disease. But recent research indicates that gluten-related disorders extend to a far broader population, and affect far more than the digestive system.

BY CATHERINE GUTHRIE

DUCK THROUGH THE DOORWAY OF Sweet Christine's Bakery in Kennett Square, Pa., and you're enveloped by the sights and smells of a classic neighborhood bakery. But what makes this bakery unusual is that everything from vanilla cupcakes to chewy chocolate-chip cookies to baguettes is gluten-free, baked with ingredients such as brown rice flour and tapioca, rather than wheat. As a result, the bakery has become a safe haven for people with both celiac disease and gluten intolerances.

Lisa Stevens, 41, the bakery's wholesale manager, spent years struggling with digestive issues before she learned she had a problem with gluten nearly four years ago: "I was always the little girl with the tummy ache," Stevens recalls. But, as she grew older, her ills spread beyond her belly. In her 20s, she was plagued by debilitating headaches, joint pain and fatigue. "I could hardly get out of bed in the morning," she says. "I was 25 but felt 85."

She bounced from doctor to doctor with no diagnosis. Finally, a friend with celiac disease insisted Stevens experiment by cutting gluten from her diet. Within two weeks of going gluten-free, her stomach stopped hurting after meals — a first. Within a few short months, her fatigue, joint pain and headaches all vanished. Testing confirmed her suspicion — gluten was the guilty party. But Stevens doesn't have celiac disease; she has an intolerance to gluten, an increasingly common diagnosis.

As scientists chip away at the mountain of health problems caused by the modern American diet, a troubling finding is emerging. Gluten, present in our most popular grains, is being linked not only to celiac disease, an autoimmune disorder affecting one out of 100 Americans, but also to non-celiac gluten intolerance, which afflicts many millions more. →



Non-celiac gluten intolerance is a lesser-understood but no-less-serious condition capable of igniting inflammation, the first stop on a path toward chronic illness. Yet not all doctors understand the condition or take it seriously, says New York City naturopathic doctor Donielle Wilson, ND: "These people need help, but conventional medical practitioners aren't listening."

Feeding the consternation of practitioners like Wilson is that many of their colleagues, including most gastroenterologists and even some celiac specialists, hesitate to acknowledge that any gluten-related disorder beyond celiac disease even exists. "The perception is that if you don't have celiac disease, you don't have a problem," says Stephen Wangen, ND, a board-certified and licensed naturopathic physician in Seattle and author of *Healthier Without Wheat* (Innate Health Publishing, 2009).

But people with non-celiac gluten intolerance have plenty of problems, as evidenced by a 2009 study in the *Journal of the American Medical Association*, which found an increased risk of death among patients with both celiac and other types of gluten-related inflammation. The risk of mortality, mostly from heart disease and cancer (two leading inflammatory conditions), was an alarming 39 percent higher in people with celiac disease and a jaw-dropping 72 percent higher in people with gluten-related inflammation.

"This is ground-breaking research that proves you don't have to have full-blown celiac disease to have serious health problems from eating gluten," says Mark Hyman, MD, chairman of the Institute of Functional Medicine and founder of the UltraWellness Center in Lenox, Mass.

If that forecast sounds dire, take heart. There's a lot you can do to dodge the gluten bullet. It starts with understanding what gluten intolerance is, and why it has become such a huge problem for so many.

Gluten Deconstructed

The word "gluten" is an umbrella term for proteins found inside many grains and seeds, namely wheat, rye, barley, spelt, kamut and triticale. Although most

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of these foodstuffs, especially wheat, are considered a mainstay of the human diet, not everyone can digest them.

Indeed, grains in general are a relatively new addition to the human diet. Our ancestors began eating them, at the earliest, 15,000 years ago, which is a blink of an eye in our 2-million-year history. Some of us have adapted; others have not.

It turns out that roughly 30 percent of northern Europeans (those who lived farthest from the origination of dietary grains in Mesopotamia) carry the genes for gluten intolerance — far more than most health experts previously believed.

At center stage is gluten-heavy wheat. Today, up to 90 percent of the protein in wheat is gluten, a 10-fold increase in the past 100 years. The average American consumes about 150 pounds of wheat each year. Think that sounds high? Stop to consider that nearly all processed foods contain wheat flour, which is often used as a breading or binding agent. Then, of course, there is our national obsession with bread, baked goods and pasta. "By the time you have toast for breakfast, a sandwich for lunch and pasta for dinner, you've had gluten at every meal," says Wilson.

When it comes to baking, gluten is the tie that binds. It traps gas bubbles in dough as it rises, giving bread its elasticity and pliability. Gluten also imparts greater tensile strength to foods, like crackers, allowing them to be shipped long distances without breaking. But it's the pleasing texture, spongy lightness and addictive chewiness in bread that keeps us hooked on gluten. As Wilson puts it, "We love our Wonder Bread."

Of course, you know that the path to good health is not paved with fluffy white tiles of Wonder Bread, but you

might not know that your all-natural, whole-wheat bread and multigrain cereal may be undermining your health almost as badly.

For people who digest gluten well, whole grains can, in moderation, be part of a healthy diet, delivering a host of macro- and micronutrients and complex carbohydrates. But for people who are gluten intolerant, even the most wholesome-looking grains can cause discomfort, fatigue, inflammation and disease.

Intolerance and Inflammation

People with celiac disease represent only a fraction of those who are wronged by gluten. While celiac afflicts roughly 1 percent of Americans, as many as 30 percent (some experts place the figure as high as 40 percent) may suffer from non-celiac gluten intolerance.

The key difference is that, in people with celiac disease, the body attacks the small intestine. But in people with non-celiac gluten intolerance, the immune system attacks the gluten.

It's basically a case of mistaken identity. The immune system sees gluten as a bacteria or virus and mounts a full-scale war. To do so, it produces an arsenal of antibodies to launch against whatever gluten you've ingested — even if it's a tiny amount.

Think of it as the antibodies the body makes when presented with a vaccine for chicken pox or the mumps. The idea is that those antibodies will patrol the body, snuffing out early signs of the disease. The difference is that most people encounter such invasions only occasionally, while most Americans eat gluten several times a day. And every time gluten enters the body of someone with intolerance, the immune system whips itself into a frenzy. Over time, gluten-induced inflammation seeps throughout the body, establishing remote outposts for chronic disease.

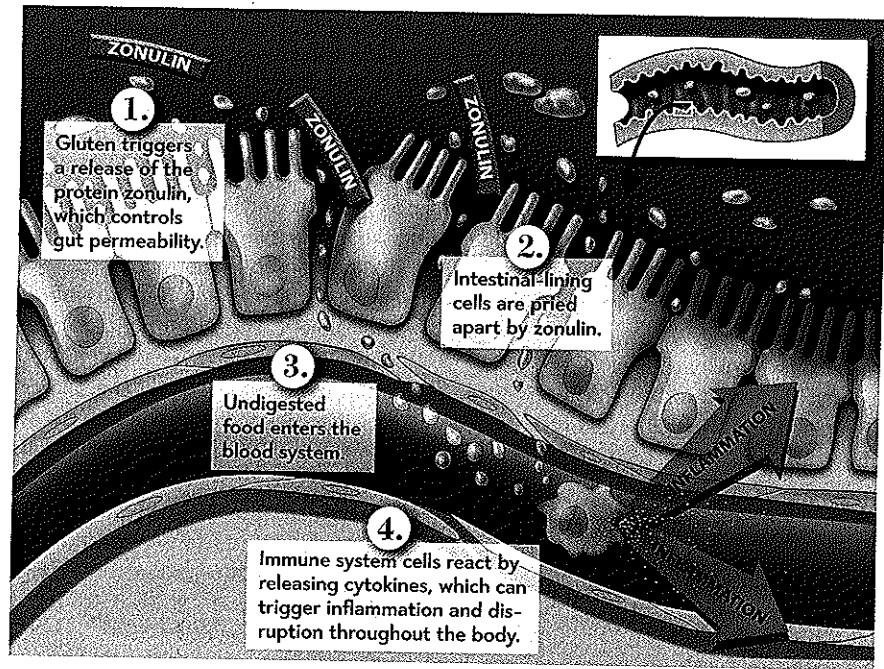
Normally, as food is broken down in the gut, digested nutrients pass through the intestinal lining on their way to the bloodstream. The cells making up the intestine's top layer act as a protective barrier, turning back particles that aren't fully digested. But in some people, gluten prompts the body to release a crowbar-like substance, called zonulin, that pries

As many as 30 to 40 percent of Americans may suffer from gluten intolerance. For these people, eating even a tiny amount of gluten can trigger a cascade of unfortunate biochemical events, leading to body-wide inflammation and, ultimately, a slew of chronic diseases.

apart the cells of the intestinal lining, allowing bits of undigested food to scoot into the bloodstream, like prisoners squeezing through bars on a jailhouse window (see illustration at right). The result is known as leaky gut syndrome.

As these particles, specifically a subset of gluten proteins called gliadins, race into the body, the immune system (most of which is stationed in the gut) spies the escapees and sounds the alarm.

"Normally, food particles are never seen by the immune system because it lies under the gut's lining," says Wilson. "But when that lining is damaged, the immune system reacts to undigested food as if it is a bacteria or virus; it sees the gliadins and lets loose an inflammatory cas-



cade. Soon, the immune system's weapons, called cytokines, flood the body, causing a ripple effect of inflammation," she explains. "And what was just a drop of ink in the water spreads throughout the entire body."

So if gluten intolerance is hastening

the deaths of millions, why isn't the news making headlines? Part of the problem is that gluten-related disorders masquerade as dozens of different diseases. In 2002, a *New England Journal of Medicine* review linked 55 different disorders to eating gluten, including anemia, →

Where Gluten Hides

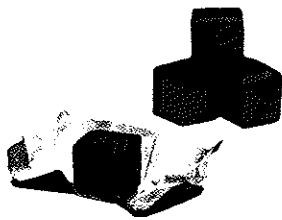
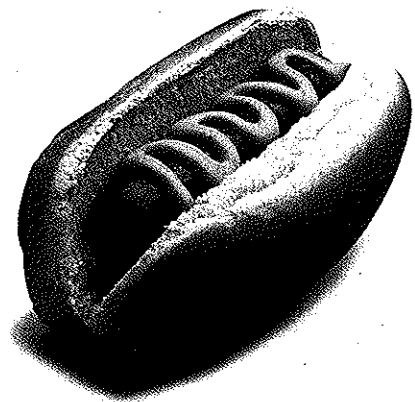
Aside from its presence in breads and pastas, gluten weasels its way into a surprising variety of ingredients and products, including:

- Wheat
- Rye
- Barley
- Spelt
- Kamut
- Durum
- Triticale
- Einkorn
- Semolina
- Couscous

- Wheat germ
- Seitan
- Bulgur
- Farina
- Faro
- Emmer
- Matzo
- Graham
- Stock cubes (broth)

- Play-Doh
- Lipstick
- Soy sauce
- Communion wafers
- Imitation meats
- Marinades
- Sauces
- Processed meats
- Textured vegetable protein
- MSG

In those with gluten intolerance, the gluten in these products causes an immune response, creating inflammation. In those with celiac disease, the gluten causes the body to attack the small intestine.





epilepsy, type 1 diabetes and cystic fibrosis. This vast and confusing diversity of diseases means doctors often wind up treating the symptoms of gluten intolerance rather than the underlying cause.

For example, a young woman with osteopenia (a precursor to osteoporosis) might be told to take calcium supplements when, in fact, her body isn't absorbing the mineral because of celiac-related erosion to her small intestine.

"Health problems caused by gluten cannot be treated with medication," says Hyman. "The only solution is to eliminate gluten from your diet."

What to Do

If you suspect gluten may be negatively affecting your health, one option is to get a blood test. One of the most sensitive of these tests sniffs out antibodies that target tissue transglutaminase (tTG for short). If you've got them, chances are you've also got celiac. If the blood tests are negative but you still have symptoms, most doctors will then run a genetic test — they swab the inside of the cheek to determine whether you have a genetic predisposition for celiac disease.

From there you can ask your primary-care doctor to refer you to a gastroenterologist who can check for celiac disease by using endoscopy to biopsy the lining of the small intestine and look for celiac-related damage. The problem with this approach, however — as mentioned earlier — is that ruling out celiac disease doesn't in any way mean you're off the hook with gluten.

To find out if you're gluten intolerant, you can have your blood tested for the presence of gliadin-sensitive antibodies, including IgG and IgA. If the tests turn up large numbers of these antibodies, it's a sign — but not a certain indication — that the body is in some way hostile to gluten.

Much more controversial are stool sample kits. These look for IgA antibodies secreted in the stool. But the accuracy of stool testing for celiac has proven to be useless, says Carol M. Shilson, executive director of the University of Chicago Celiac Disease Center. In fact, none of these tests is 100 percent accurate.

"Ultimately, you can spend hundreds of dollars on tests and still not have an answer," says Evan Buxbaum, MD, a pediatrician in Eastsound, Wash., who specializes in gluten-related health problems.

Accordingly, like many integrative practitioners, he leans on the elimination-and-reintroduction diet as the gold standard for diagnosing gluten intolerance. Far less expensive and invasive than the other methods, it simply calls for you to eat a gluten-free diet for two to four weeks and see if your symptoms improve.

If you choose this option, you'll need to cut out gluten-containing grains as well as sneaky sources of gluten (see "Where Gluten Hides" on page 43 and "Gluten-Free Grains," right). The success of this trial depends on your ability to nix 100 percent of gluten from your diet. Then, after two to four weeks of being gluten-free, eat a slice of bread and see what happens. If you observe the onset of symptoms, such as digestive distress, brain fog, joint pain or skin troubles, you've got your answer.

Gluten-Free Feeding Frenzy

Americans now spend more than \$2 billion a year on gluten-free products, and finding gluten-free goodies is easier than ever. But just because you can stock your pantry with gluten-free pancake mixes, brownies, cookies and breads doesn't mean you should.

You're better off thinking of these products as occasional treats rather than daily staples, advises Wilson. That's because gluten-free breads, pastas and crackers are often high in simple carbohydrates, such as potato starch, that rocket through the digestion process and lead to spikes in blood sugar. Such blood-sugar surges damage the body over time, and also contribute to inflammatory conditions.

Instead, Wilson encourages her patients to think in threes: Combine a lean protein with a healthy fat and a serving of non-grain carbohydrates in the form of a vegetable, legume or fruit. For instance, breakfast might be an omelet with spinach and goat cheese. Dinner could be a stir-fry with chicken, broccoli and almonds. That approach, Wilson says, can help the gluten intolerant avoid inflammation while maximizing body-healing nutrition.

The good news is that both celiac disease and non-celiac gluten intolerance are 100 percent curable. Remove the gluten and the body heals itself. ♣

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Gluten-Free Grains

Being gluten intolerant doesn't mean you have to eat a totally grain-free diet. Here are a few options you can still enjoy (in moderation) when grain-cravings strike:



Rice



Corn



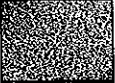
Quinoa



Buckwheat



Millet



Amaranth



Teff



Sorghum



Wild rice



A note about oats:

Experts hotly debate whether oats are tainted by gluten.

Oat advocates point

to studies showing oats don't appear to damage the small intestines of people with celiac. Yet, detractors say oats are bound to be contaminated by gluten because they are often processed in facilities that handle gluten-containing grains. So it's best to steer clear. If you're concerned about contamination, choose Bob's Red Mill oats (available at most major grocery stores). They are considered by many to be the "cleanest" oats around. If you're still unsure, putting oats on your list of foods to eliminate and reintroduce can help you determine if they are problematic.