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## Should everyone avoid gluten? Separating the wheat from the chaff when it comes to grain proteins

**Few food ingredients are as controversial as gluten, the cereal grain protein linked to celiac disease. But for people who don't suffer from celiac disease, the health benefits of cutting out gluten are less clear.**

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In a news and social climate where "fake news" runs rampant and every tidbit of information is questionable, food is no exception. Depending on where you look, Canadian tomatoes actually come from Mexico, the microbiome is linked to Alzheimer's, eating clean equals weight loss, a beef-only diet works wonders, and eating gluten gives you gut problems.

Food, now more than ever, is washed down with both suspicion and hope. Consumer issues around food are almost unlimited, ranging from animal rights

to corporate transparency, from cardiovascular disease to diabetes. It can be hard to sort pseudoscience from hard evidence where food is concerned, and even in the scientific realm, nutrition advice often changes as fast as a berry in a blender.

*“Food isn’t just about nutrition. It has broader social and symbolic meaning.”*

Dr. Charlene Elliott, PhD, a professor in UCalgary's [Department of Communications, Media and Film](#), and Canada Research Chair in Food Marketing, Policy and Children’s Health, admits it’s tough to keep up with the latest information on nutrition and science. “It’s fun to follow the research on something like, say, coffee,” she says. “One month, coffee has health benefits and the next, it causes cancer.”

Elliott also says food doesn’t exist in a vacuum. “Food isn’t just about nutrition,” she says. “It has broader social and symbolic meaning.” A third-grader who eats brand-name, pre-made, packaged lunches is cool. A millennial who eats beautiful rice bowls is the picture of health. And rejecting wheat is like rejecting the authority of *Canada’s Food Guide*.

And increasingly, the social environment of food includes a deluge of self-proclaimed healthy eating experts, many of whom recommend avoiding gluten. From [Deliciously Ella](#), with her 1.3 million Instagram devotees, to the mysteriously mononymous food blogger, “Jess,” author of [Choosing Chia](#) (follow her plant-based diet and “you’ll *easily* nourish your body with the nutrients you need to feel at your best!”), social media personalities tell us what to eat and what to avoid — often with little or no basis in science.

## Gluten: with us or against us?

Gluten is a prime example of the complexity of the nutrition discourse. It has firm links to celiac disease — but those links are complicated. Not everyone with celiac disease finds relief when they stop eating gluten, and gluten can cause health issues for some without celiac disease or gluten intolerance.

Gluten has created a contentious debate in nutrition and health-care circles. In the *New York Times* bestsellers, *Wheat Belly* and *Wheat Belly 10 Day Grain Detox*, cardiologist William Davis advocates eliminating all wheat from everyone’s diet (not just those with celiac disease), and links wheat with heart disease, cancer and more.

On the other hand, responses in the broader medical community, such as a 2017 [BMJ article](#), question the link between gluten and coronary heart disease, and suggest that avoiding gluten may actually lead to increased cardiovascular risk. “The promotion of gluten-free diets among people without celiac disease,” the article concludes, “should not be encouraged.”

So what *is* the truth about gluten, then? Is eliminating gluten the only way to treat the discomfort of celiac disease, or are there other ways to mitigate that disorder's effects? And why, if gluten is not inherently unhealthy, does it play the role of villain in narratives like *Wheat Belly*?

## What is gluten?

Gluten is actually pretty close to what it sounds like: "gluten" stems from a Latin word meaning "glue." It's a family of proteins that gives foods like bread a stretchy, chewy quality (ever stretched pizza dough into a pan?).

But people have been eating bread and grains for centuries, so why the sudden angst about gluten? One reason is that gluten is now everywhere, according to [Dr. Justine Dowd](#), PhD, a specialist in celiac disease and a postdoctoral fellow in the University of Calgary's [Faculty of Kinesiology](#). "One hundred years ago or so, people were eating gluten but it wasn't added to everything like it is now," says Dowd. "So now it has more of an impact on people's systems."

In fact, gluten often hides in products as a stabilizing or binding agent, popping up in anything from salad dressing to lip balm to MSG to vitamin supplements.

So how do our guts handle this substance? When you eat, say, a slice of rye toast, an enzyme produced in your intestinal wall breaks down the gluten into its two key proteins: gliadin and glutenin. As these proteins pass through your intestines, your immune system checks them out to see if they contain anything harmful. If you have no trouble digesting gluten, these proteins are given a thumbs-up and absorbed.

If you're able to absorb these proteins, your body will thank you, according to [Harvard's School of Public Health](#). Diets high in whole grains, including wheat, are linked to reduced chances of heart attack, stroke, type-2 diabetes and even death. Gluten may also feed the "good" bacteria in our bodies, which keep our guts healthy.

But for those with celiac disease or gluten sensitivities, gluten is not a welcome visitor.

## Gluten and celiac disease

In people who are sensitive to gluten, the gut's immune system identifies one of the gluten proteins (gliadin) as dangerous, and attacks it with antibodies. In people with celiac disease, the immune system attacks the gliadin but also attacks the enzyme that broke down the gluten into its two proteins in the first place.

Dowd explains this process: "Your intestine has villi — finger-like projections that absorb nutrients when we eat. Unfortunately, if you have celiac disease, your system's immune response to gluten causes these villi to get flattened.

You often can no longer absorb nutrients like iron and B12 as you should, and those valuable nutrients go right through you.”

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The intestinal barrier that usually keeps food inside the intestines (out of the bloodstream and away from organs), can also start to weaken and the gut can become leaky. “There can start to be gaps in the tight junctions in the intestine,” says Dowd, “so bacteria and toxins can leak out of the intestines and that can lead to the immune system mounting a response to something that would normally be okay.”

This response leads to the classic symptoms of celiac disease: bloating, constipation, diarrhea, weight loss, and malabsorption — and also extraintestinal symptoms such as headaches, skin issues, arthritis, neuropathy, infertility, delayed puberty and short stature.

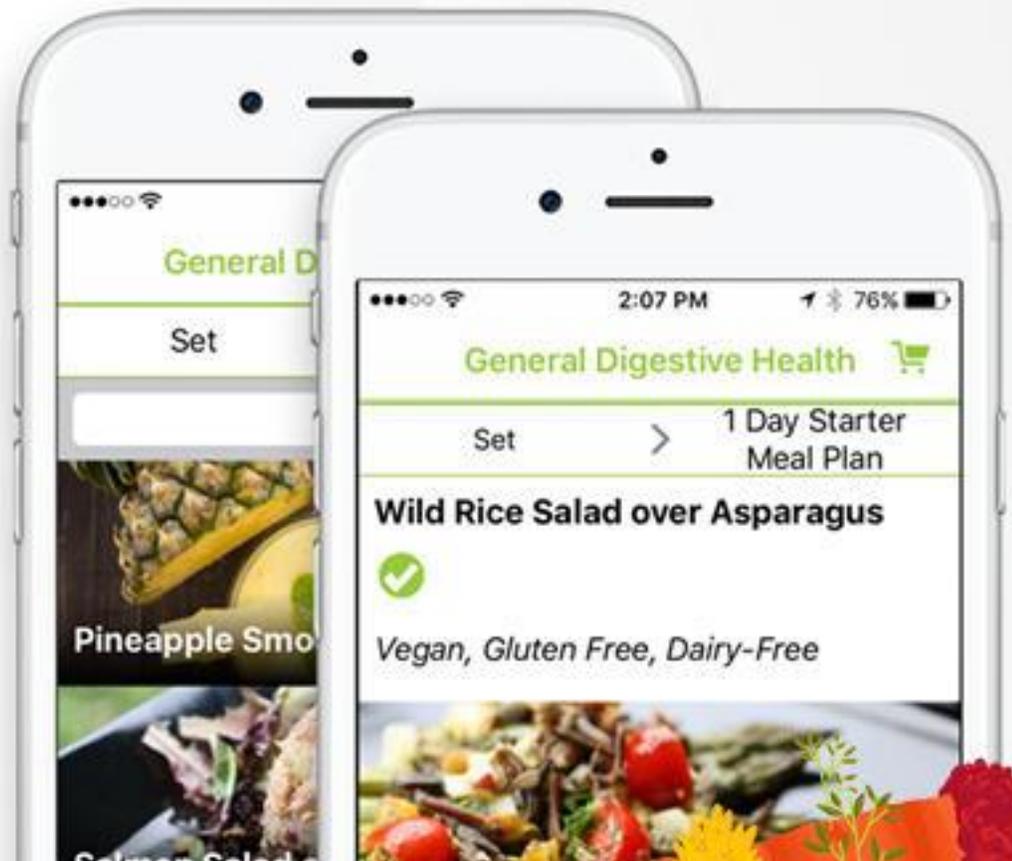
The effects of celiac disease go well beyond not feeling well after eating gluten. “There can also be a variety of long-term problems for people with undiagnosed celiac disease,” says Dowd, “such as infertility, osteoporosis, gastrointestinal cancers, joint pain, skin conditions and migraines. We are just starting to realize how the disease manifests itself outside of the intestinal area.” And the disease affects hundreds of thousands of Canadians. According to the [Canadian Celiac Association](#), it’s likely that one per cent of Canadians have celiac disease.

Dowd says research on celiac disease is still in early days: “Research is just starting to figure out why people with celiac disease have so many different symptoms.” She’s hoping to find new ways to help people cope with celiac disease and a gluten-free diet. “It’s getting easier to manage that diet now,” she says, “but it’s still tricky. Many people really struggle when they go gluten-free, and some people continue to feel a variety of negative symptoms after they eliminate gluten. We are trying to alleviate those struggles and help elevate the quality of life for those with celiac disease.”

## **Getting the word out on celiac disease, gluten and gut health**

In a world where blogs and Instagram stars often replace evidence-based information sources, it can be challenging to find reliable news on celiac disease and nutrition. To address this problem, Dowd joined forces with Desiree Nielsen, a registered dietitian from Vancouver, and Darlene Higbee Clarkin, CEO and founder of KORE Digital Health Therapeutics. Together they created an app called [MyHealthyGut](#), which has already seen about ten thousand downloads in two years.

“Our goal was to create an app that would improve overall gut health and empower people with celiac disease to self-manage the condition effectively,” says Dowd. She recognizes that it’s not an easy diagnosis to receive. “You might think, ‘Oh my gosh, I have to cut out gluten — how am I ever going to do that?’”



Screen captures from the MyHealthyGut app.

Nielsen says MyHealthyGut gives people with celiac disease extra support that’s crucial for their well-being. “At your doctor’s office,” she says, “there often isn’t the opportunity or time to provide the in-depth education that’s critical to thriving with this chronic condition. The app helps those without the financial means to seek private practice care. The app is like a ‘dietitian in your pocket’ to help you craft an evidence-informed nutrition program.”

The app helps you figure out which foods bother you, and its expanded, fee-based version helps you monitor what you eat. “This food log helps you to keep track of what you’re eating and how it’s making you feel,” explains Dowd. “You can also send that information directly to your health-care provider and it creates a chart about how you feel and what you’re eating.”

Dowd was diagnosed with celiac disease just before she started her PhD program. "I've lived it and can really understand when I talk to participants," she says. "My goal is to empower people living with celiac disease to take a holistic approach to their health so their bodies can heal, and, ultimately, to optimize their well-being in all aspects of life."

## Going gluten-free? Be kind to yourself

Because going gluten-free is crucial to the well-being of most people with celiac disease, and because maintaining this diet is often extremely difficult, Dowd is researching other ways to help people manage their diet. She's running a study called POWER-C, which analyzes the effects of strategies like self-compassion and self-regulation for people with celiac disease.

The first study of its kind, POWER-C is ongoing, but preliminary results suggest that self-compassion plays an important role in managing celiac disease and following a gluten-free diet. [Self-compassion](#) is a deceptively simple concept — it's giving yourself the same kindness, forgiveness and consideration you would give to someone else. It involves mindfulness and a sense of connection with other people.



Dowd speculates that self-compassion is vital to effectively managing a chronic condition like celiac disease because it creates an environment that is non-judgmental. People exercising self-compassion tend to set more realistic, achievable goals and are kinder to themselves when they reflect on their own progress. It's an environment that nurtures adaptation and improvement, even as it forgives backward steps.

Dowd and her team have heard positive feedback from study participants. Some report that the program helped them get back to traveling; others are now able to explain to friends why they can't have certain foods. So far, the kinder, gentler approach seems to be working.

## Exercising your celiac

It's not just diet and self-compassion that can help people manage their celiac symptoms. Dowd is also running a research study investigating how other lifestyle changes, such as exercise, can support a gluten-free, whole-foods diet to improve the lives of people with celiac disease. Her research colleagues include Drs. Raylene Reimer, PhD, Guillaume Millet, PhD, and Nicole Culos-Reed, PhD, all from UCalgary's Faculty of Kinesiology. The study, titled "MOVE-C: Understanding the Relationship Between the Microbiome, Vitality and Exercise in Celiac Disease," enrolled inactive adults with celiac disease and randomized them into either a 12-week program of supervised, progressive, high-intensity interval training and group-based holistic lifestyle education sessions, or a waitlist control group. The lifestyle sessions include information on a whole-foods, gluten-free diet, sleep improvement techniques, and training in self-compassion.

The study is still underway but preliminary results are positive. Initially, Dowd is finding that the people in the exercise group report improvements in following a strict gluten-free diet, feel more compassionate toward themselves, and maintain quality of life better than those in the waitlist control group.

There are several reasons to feel optimistic about exercise as a force for improvement in those with celiac disease. "Exercise may help with increasing blood flow to the intestines, or reducing inflammation," says Dowd. "And some studies are starting to show that exercise might promote a healthy microbiome."

The bacterial environment in the intestine is particularly relevant when people switch to a gluten-free diet. "Often when people first go on a gluten-free diet they resort to the gluten-free aisles at the grocery store," says Dowd. "These primarily contain highly processed foods that are often higher in sugar and calories, but lower in nutrients when compared to their gluten-containing counterparts."

According to Dowd, as people with celiac disease follow a gluten-free diet and their intestines heal, they begin to absorb nutrients and calories again — which unfortunately often leads to substantial weight gain if they are eating unhealthy

foods. "This puts them at higher risk for metabolic syndrome," she says, "which is associated with the microbiome being off-kilter." So if exercise can have a positive influence on the gut and its microbiome, an active lifestyle may become a priority for those with digestive health issues.

## The downside of gluten-free

A gluten-free diet helps the majority of people with celiac disease, but finding healthy, packaged, gluten-free food is not without its challenges. Charlene Elliott studies food marketing, policy and children's health. Like Dowd, she's concerned about a common assumption made by consumers: that eating products labeled "gluten-free" means you're making *healthy* choices for you or your children.

Healthy or not, gluten-free foods are a burgeoning market. "Gluten-free foods have a sort of 'health halo' for many consumers," says Elliott. Noting the number of parents who purchase gluten-free products for their children (even those without gluten intolerance), Elliott headed up a study to find out whether this health halo is deserved.

Using criteria set out by the [Pan American Health Organization](#) (PAHO), Elliott analyzed the nutritional quality of packaged, gluten-free products targeting children, and found that 88 per cent of those foods have poor nutritional quality, compared to 97 per cent of "regular" products. "According to the PAHO criteria, these products labelled gluten-free foods are certainly not 'healthier' choices," says Elliott.

*"Celiac children or those with gluten intolerance now can eat the same kind of highly processed, low-nutrient foods as the rest of the kids."*

Elliott's study took an even closer look at the gluten backlash, comparing children's gluten-free products to their "regular" equivalents. She found that both categories were similar in caloric content, fat and protein levels. But the gluten-free products had higher levels of free sugars. To their credit, the gluten-free products had lower levels of sodium than their "regular" counterparts. "Overall," says Elliott, "the nutritional content of both categories was poor."

This is a sad commentary on the state of child-specific packaged foods. What Elliott finds troubling is that the products labelled "gluten-free for children" end up being a type of false prize for children with celiac disease. "The food industry has filled a consumer demand," says Elliott, "but it means that celiac children or those with gluten intolerance now can eat the same kind of highly processed, low-nutrient foods as the rest of the kids."

Elliott longs for a more generalized push-back against these kinds of foods. "Shouldn't we be aiming for better diets for all? If we all moved toward eating

whole and unprocessed foods, it would be better for kids and adults across the board.”

## Gluten-free for the non-gluten-sensitive

So the gluten-free diet, which can be crucial to the health of those with celiac disease, has to be taken with a grain of salt. Foregoing gluten is also popular with those who sense that they may not feel well when they eat gluten, or who are simply looking for a way to clean up their diet — witness movements like #eatingclean, blogs like “Deliciously Ella” and books like *Wheat Belly*.

On one hand, according to Nielsen, there are many valid reasons to go gluten-free. “People with irritable bowel syndrome (IBS) or autoimmunity issues may feel much better going gluten-free,” she says. “However, gluten does not make 100 per cent of people feel sick. It’s not necessary to demonize wheat and gluten. This has gotten out of hand, due in large part to the interaction of celebrity and unlicensed wellness practitioners and influencers. There isn’t anything inherently dangerous about eating gluten.”

And yet the public chomps at the gluten-free bit. According to Elliott, the food industry sees gluten-free as the fastest-growing category of food intolerance — and a vehicle for corporate growth. According to a study by [Transparency Market Research](#), sales of gluten-free foods globally are projected to reach US\$4.89 billion by 2021, up from \$2.84 billion in 2014. This trend isn’t just due to an increase in consumers with celiac disease. “Mainstream consumers are experimenting with their diets for health-related reasons,” says Elliott, “and ‘free-from’ foods (such as gluten-free) are part of that trend.”

Elliott cites a study by Hartman group called "[Health and Wellness 2017](#)," which gave the top reasons for purchasing gluten-free products:

- Wanted to try something new
- Believe they are healthier
- Trying to lose weight

Only 17 per cent of respondents said they had a gluten sensitivity or allergy.

Which brings us back to Elliott’s observation that food isn’t just about nutrition. It’s about style, education, social hierarchies, status, rejecting authority and exercising personal choice. The world of food has changed dramatically in the last century, and even in the last decade.

It’s a tumultuous time for food and foodies, and particularly for those with disorders like celiac disease. Is gluten an angel or a demon? Perhaps only time will tell. But in the meantime, consumers should cast a critical eye on food blogs and labels.

“We’re still in the infancy of understanding the relationship between nutrition and disorders like celiac disease,” says Dowd. “When I attend conferences I see how far the research has come every year. Ultimately, I feel optimistic that there will be great advances in the years to come.”

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***Dr. Charlene Elliott, PhD***, is a professor in UCalgary's Department of Communications, Media and Film in the Faculty of Arts, and Canada Research Chair in Food Marketing, Policy and Children's Health. Her main program of research focuses on obesity and public health, taste and communication, and intellectual property and sensorial communication. [Read more about Charlene](#)

***Dr. Justine Dowd, PhD***, is a specialist in celiac disease and a postdoctoral fellow in UCalgary's Faculty of Kinesiology. Her research is in the area of health behaviour change and she is specifically using evidence-based strategies, such as self-compassion and self-regulation, to improve quality of life and adherence to a gluten-free diet among people living with celiac disease. [Read more about Justine](#)