
WHAT EXACTLY IS GLUTEN? HERE'S EVERYTHING YOU NEED TO KNOW

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Gluten-free diets have become increasingly popular in recent years, especially due to the growing awareness of gluten-related disorders.

In turn, this has fueled a rapid rise in the mainstream availability of gluten-free food options. In fact, the gluten-free food industry was valued at \$4.3 billion in 2019.

The introduction – and increase in availability – of these products made what was once a difficult-to-stick-to diet much easier to follow.

Although gluten-free diets are more common, gluten does not pose a health risk to the majority of the U.S. population, as less than 1% of it is affected by celiac disease.

That said, people with celiac disease, non-celiac gluten sensitivity, and some other conditions must eliminate gluten from their diets to avoid harmful, adverse reactions.

This article reviews everything you need to know about gluten, including what it is, which foods contain it, who may need to follow a gluten-free diet, and how to eat a gluten-free diet.

What is gluten?

Gluten is a family of storage proteins – formally known as prolamins – that are naturally found in certain grains, such as wheat, barley, and rye.

Many prolamins fall under the gluten umbrella, but they're most commonly identified by the specific grains in which they're found. For instance, glutenins and gliadins are the prolamins in wheat, secalins are found in rye, and hordeins are found in barley.

In foods, gluten has a variety of functional culinary benefits. It gives many grain-based foods their soft chewy texture.

In bread, for instance, gluten proteins form an elastic network that stretches and traps gas, allowing the bread to rise and retain moisture.

Because of these unique physical properties, gluten is also frequently added to processed foods to improve texture and promote moisture retention.

SUMMARY

Gluten is a group of various proteins found in certain grains. It performs a variety of beneficial functions in bread products, but those with celiac disease cannot tolerate it.

Foods that contain gluten

Gluten may be found in a variety of whole and processed foods, including:

- Grains: whole wheat, wheat bran, barley, rye, triticale, spelt, kamut, couscous, farro, semolina, bulgur, farina, einkorn, durum, wheat germ, cracked wheat, matzo, mir (a cross between wheat and rye)
- Processed grain-based products: crackers, bread, breadcrumbs, pasta, seitan, wheat-containing soba noodles, some veggie burgers and other meat substitutes, cookies, pastries
- Other foods and beverages: barley malt, malt vinegar, soy sauce, certain salad dressings, sauces or gravies thickened with flour, bouillon and some broths, certain spice blends, flavored chips, beer, certain kinds of wine and liquor, some processed meats.

Because gluten is often used in food production as a thickener or stabilizer, it's not always clear whether a particular food contains it.

What's more, many commercial food operations share preparation equipment with gluten-containing foods. Thus, even if a food is inherently gluten-free, it could be contaminated with gluten during processing.

If you follow a strict gluten-free diet and are unsure about a particular food's gluten status, check the package for a gluten-free label or contact the manufacturer prior to purchasing it.



Oats

When it comes to gluten-free diets, oats are a bit of a conundrum.

One of the main issues with oats is that they're frequently transported and processed with equipment that's also used to process wheat. This leads to the widespread gluten contamination of oats, even if there isn't mention of wheat or gluten on the product label.

Still, it's easy to find oats that are certified and labeled gluten-free. Gluten-free oats are simply regular oats that have been processed using equipment and facilities that are free of gluten contamination.

However, some experts argue that there's no such thing as gluten-free oats — even if they're labeled as such.

That's because oats contain a protein called avenin, whose structure is very similar to those of the proteins in gluten.

Early research suggests that, in rare cases, a small percentage of people with gluten-related disorders may react similarly to avenin as they do to gluten.

That said, the vast majority of current evidence suggests that most people with gluten-related disorders can tolerate gluten-free oats without issues.

In fact, uncontaminated oats are often encouraged for gluten-free diets due to their rich supply of fiber and essential nutrients.

Ultimately, more research is needed to better understand how the avenin in oats affects digestion and immune function in people with gluten-related disorders.

If you suspect that you may be intolerant to oats, talk with your healthcare professional.

SUMMARY

Gluten may be present in a variety of foods, including wheat, barley, rye, and related grains. It's also used as a thickening agent in processed foods. Look for gluten-free oats to be sure they haven't been processed in a facility with gluten.

What does a gluten-free label mean?

If you're working on eliminating gluten from your diet, it can be challenging to know whether a product was supplemented with a gluten-containing ingredient or inadvertently contaminated during processing.

This is why many government health authorities have implemented gluten-free food labeling regulations.

While these labels can make gluten elimination much easier, they don't necessarily mean that gluten is completely absent from the item.

In the United States, the European Union, and Canada, a product can carry a gluten-free label as long as gluten makes up fewer than 20 parts per million (ppm) of the product. That means that for every million parts of the food, up to 20 of them can be gluten.

The 20 ppm threshold was set due to some evidence that suggested that the majority of people with gluten-related disorders are unlikely to experience adverse reactions at this level. However, some countries have opted to set the limit as low as 3 ppm.

SUMMARY

Gluten-free food labels are used in many countries, but they don't mean that a particular product is completely free of this protein. Most countries allow up to 20 ppm of gluten in products labeled gluten-free.

Certain medical conditions may require a gluten-free diet

Though gluten is safe for most people, certain medical conditions require a gluten-free diet as part of the treatment protocol.

Celiac disease

Celiac disease is a serious autoimmune condition in which a person's immune system attacks cells of their small intestine when they ingest gluten.

It's one of the most well-researched causes of gluten intolerance and estimated to affect approximately 1% of the global population.

Like many other autoimmune conditions, the exact cause of celiac disease remains unclear, but there is strong evidence of a genetic component.

Medicinal treatments for celiac disease are currently being researched, but the most widely accepted and utilized treatment is a strict gluten-free diet.

Non-celiac gluten sensitivity

Non-celiac gluten sensitivity (NCGS) describes several negative symptoms that are resolved when gluten is eliminated from the diets of people who do not test positive for celiac disease or wheat allergy.

At this point, very little is known about NCGS, but current treatment includes adherence to a gluten-free diet.

Irritable bowel syndrome

There's a bit of an overlap between NCGS and irritable bowel syndrome (IBS), as some people who suffer from IBS report wheat as a food they can't tolerate.

Within the scientific community, it's unclear why wheat can be problematic for some people with IBS but not others.

Either way, some research suggests that a gluten-free diet may be appropriate for some people with IBS, and especially for those with IBS-D, or irritable bowel syndrome-diarrhea.

Wheat allergy

A wheat allergy is not a gluten-related disorder, but it's a closely related condition.

Wheat allergies are an intolerance to wheat itself, not just the gluten protein. Thus, someone with a wheat allergy must avoid wheat but may still safely consume gluten from nonwheat sources like barley or rye.

That said, many people who have a wheat allergy end up following a mostly gluten-free diet because the two ingredients are so closely linked and coexist in many of the same foods.

Children with a wheat allergy often outgrow it and are able to incorporate wheat into their diet around school age.

SUMMARY

Certain medical conditions require a gluten-free diet as treatment. These include celiac disease, non-celiac gluten sensitivity, and gluten-related disorders like wheat allergies.

Common symptoms

Symptoms of gluten intolerance can manifest very differently depending on the individual.

The range of possible symptoms that may be caused by gluten-related disorders is vast and not always intuitive. Some people have no obvious symptoms at all, and conditions like celiac disease or NCGS often go untreated or misdiagnosed.

Symptoms of gluten-related disorders may include:

- Digestive issues: diarrhea, bloating, abdominal pain, constipation, inflammation of digestive tissue
- Skin problems: rash, eczema, skin inflammation
- Neurological issues: confusion, fatigue, anxiety, numbness, depression, lack of focus, difficulty speaking
- Other: weight loss, nutrient deficiencies, diminished immune function, osteoporosis, headaches, anemia

If you suspect that you have a gluten-related disorder, you should consult a healthcare professional – even before attempting to eliminate gluten from your diet.

Some testing procedures for certain gluten-related conditions like celiac disease may give inaccurate results if you're already adhering to a strict gluten-free diet.

What's more, certain symptoms that may seem like a reaction to gluten could be a reaction to something else.

Thus, the best first-line approach is to discuss your symptoms with a healthcare professional before attempting to diagnose or treat yourself.

SUMMARY

Gluten-related disorders can cause a very broad range of symptoms, including digestive problems, skin rashes, weight loss, headaches, and bone loss.

What to eat on a gluten-free diet

A large number of foods are naturally gluten-free, such as fresh fruits and vegetables, most unprocessed or fresh animal meats and seafood, many fats and oils, and more.

Here is some guidance on what you can eat within each of the main food groups if you have a gluten-related disorder.

Fruits and vegetables

All fresh fruits and vegetables are gluten-free. However, gluten-containing ingredients are sometimes added to processed fruits and vegetables, particularly if they're flavored.

Produce that's plain and frozen, canned in just water or juice, or unsweetened and dried are typically gluten-free, too, but check labels just to be sure.

Proteins

Most fresh, plain, and unflavored proteins are naturally gluten-free. For instance, red meat like fresh beef, pork, lamb, and bison; fresh chicken, turkey, and seafood; nuts and seeds; legumes; and traditional soy foods, such as tofu, tempeh, and edamame.

Breaded proteins should be avoided. Check any proteins that are processed (e.g., hot dogs, deli meats, etc.) or combined with any sauces or seasonings, as well as ground meats.

Dairy products

Many dairy products, particularly those that are plain or unflavored and/or don't contain additives, are inherently gluten-free.

Be sure to check flavored milks and yogurts, processed cheese products — especially spreads and sauces, and ice cream to ensure the one you're purchasing is gluten-free.

Fats and oils

Nearly all fats and oils, from butter and ghee to oils made from nuts and seeds, are naturally gluten-free. Double-check all cooking sprays, though, as well as any flavored or spiced oils.

SUMMARY

Most fresh, whole, and unprocessed fruits, vegetables, protein-based foods, fats, and oils are naturally gluten-free. When those food items are processed or flavored or even just packaged, check the ingredient list or look for a gluten-free label.

The bottom line

Gluten-free diets are more popular than ever, but there's often confusion about what gluten is and when it ought to be eliminated.

Gluten refers to a variety of proteins naturally found in cereal grains, such as wheat, barley, and rye.

There's nothing inherently unhealthy about gluten, but people with certain medical conditions like celiac disease, non-celiac gluten sensitivity, or wheat allergy should avoid it, as it may cause serious adverse reactions.

Symptoms of gluten-related disorders are broad and may include digestive issues, inflamed skin, and neurological problems.

If you suspect that you have a gluten-related disorder, consult a qualified healthcare professional.

Gluten Intolerance Food List: What to Avoid and What to Eat

A gluten intolerance is the body's inability to digest or break down the gluten protein found in wheat and certain other grains. Also known as a gluten sensitivity, gluten intolerance can range from a mild sensitivity to gluten to full-blown celiac disease.

According to the National Institute of Diabetes and Digestive and Kidney Diseases [Trusted Source](#), about 1 out of every 141 Americans has celiac disease. This is a severe autoimmune disorder triggered by gluten consumption that leads to damage in the small intestine.

Common foods that regularly contain ingredients with gluten include:

- pastas
- breads
- crackers
- seasonings and spice mixes

Foods to avoid

Wheat is one of the main staples of a Western diet and is public enemy No. 1 for those with a gluten intolerance.

In addition to pure wheat, all of its forms are also off-limits. This includes:

- wheat starch
- wheat bran
- wheat germ
- couscous
- cracked wheat
- durum
- einkorn
- emmer
- farina
- faro
- fu (common in Asian foods)
- gliadin
- graham flour
- kamut
- matzo
- semolina
- spelt

The list of gluten-containing grains doesn't end at wheat. Other offenders are:

- barley
- bulgur
- oats (oats themselves don't contain gluten, but are often processed in facilities that produce gluten-containing grains and may be contaminated)
- rye
- seitan
- triticale and Mir (a cross between wheat and rye)

Foods without gluten

The list of off-limit items may seem daunting at first. Thankfully, there are plenty of replacements on the menu. Lots of foods are naturally gluten-free, including:

- fruits and vegetables
- beans
- seeds
- legumes
- nuts
- potatoes
- eggs
- dairy products
- oils and vinegars
- corn
- rice
- fish
- lean beef
- chicken
- seafood

Many other grains and foods are gluten-free as well:

- amaranth
- arrowroot
- buckwheat
- cassava
- millet
- quinoa
- rice
- sorghum
- soy
- tapioca

You can find a plethora of gluten-free grain options on Amazon.

It may seem daunting to go gluten-free at first. But for many, the advantages far outweigh the inconvenience. The first step is to get rid of all the gluten-containing products in your kitchen and stock it with alternatives.

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Check out online options for pantry staples such as gluten-free breads, pasta, crackers, and cereals. For baking, use substitute flours. These can include:

- buckwheat
- corn
- millet
- rice
- sorghum
- quinoa
- chickpea

You'll need xanthan gum or guar gum as a substitute for gluten when baking. Stick to unprocessed, fresh, whole foods to naturally stay gluten-free.

A note about eating out

Eating at restaurants can be particularly challenging if you have a gluten intolerance, but this doesn't mean you can't ever dine out.

You should be able to dodge the gluten bullet if you stick with the same types of items you eat at home, such as grilled meats and steamed vegetables.

Foods to avoid in restaurants include fried foods, certain sauces, or anything that has been fried in the same pan with a gluten-containing food.

Celiac disease requires extra caution when eating out. Make sure that dietary restrictions are communicated to the chef in advance.

Certain restaurants are almost certainly out of question for those on a gluten-free diet, including fast food restaurants, buffets, salad bars, and most bakeries.

On the flipside, some establishments, such as vegetarian restaurants, cater to the gluten-free diet. Some restaurants also have dedicated gluten-free prep and cook areas, but calling ahead to confirm is always a good idea.

Outlook

If you have celiac disease, being gluten-free is essential for your health. A gluten-free diet may seem too challenging to deal with, but with time – and a bit of effort – it can become second nature.

If you can, start off gradually, so you can get used to going gluten-free. For example, you might try one completely gluten-free meal per day and gradually add more meals until gluten is completely out of your diet.

Also, a gluten-free diet is easier if you shop at stores and eat at restaurants that cater to your dietary needs.

If you want to guarantee that your food is gluten-free, cooking from scratch is the easiest way to avoid gluten. Discuss any specific dietary considerations with a doctor or dietitian.

How Is Gluten Intolerance Tested?

Currently, there are no agreed upon methods for testing for gluten intolerance. There are, however, tests for celiac disease, an autoimmune disorder that triggers a significant allergic reaction to gluten. Without a validated test for non-celiac gluten sensitivity, many look into celiac testing.

Celiac disease is uncommon, affecting only 0.7 percent [Trusted Source](#) of the U.S. population. A negative test for celiac disease does not mean you do not have gluten intolerance.

Gluten is a protein in wheat, rye, and barley. It can also be found in some medications, lipsticks, and toothpastes.

In people with celiac disease, eating gluten causes the immune system to produce antibodies that attack the lining of the small intestine. Not only can this cause digestive system damage, but also it can prevent the body from getting important nutrients.

Blood test

You can get a simple blood test to screen for celiac disease, but you must be on a diet that includes gluten for it to be accurate. The blood test screens for certain antibodies that are higher than normal for people with celiac disease.

Biopsy

A biopsy of tissue from the small intestine is the most accurate way to diagnose celiac disease. In the diagnosis process, your doctor will most likely start with a blood test, such as tTG-IgA.

If one of those tests indicates the possibility of celiac disease, your doctor might perform an endoscopy to view your small intestine and take a biopsy for analysis before having you make dietary changes.

tTG-IgA test

One of the initial screens for celiac disease is the Tissue Transglutaminase IgA antibody test. According to the Celiac Disease Foundation, this test's sensitivity is:

- positive in about 98 percent for people who have celiac disease and are eating a gluten-containing diet
- negative in about 95 percent for people who do not have celiac disease

For children around 2 years old and younger, the test will usually include Deamidated Gliadin IgA and IgG antibodies.

There is a minor chance for false-positive results for people who don't have celiac disease but do have an associated immune disorder, such as rheumatoid arthritis or type 1 diabetes.

EMA test

The IgA Endomysial antibody (EMA) test is typically reserved for people who are difficult to diagnose for celiac disease. It's not as sensitive as the tTG-IgA test and is more expensive.

Total serum IgA test

This test checks for IgA deficiency, which can cause a false-negative tTG-IgA or EMA result. If the test indicates that you have an IgA deficiency, your doctor might order a DGP or tTG-IgG test.

Deamidated gliadin peptide (DGP) test

If you have an IgA deficiency or test negative for tTG or EMA antibodies, this test for celiac disease might be used. Although it's unusual, if your tests are negative but the symptoms of gluten intolerance do not subside, talk with your doctor about other testing options or alternative diagnoses.

Genetic testing

In the diagnosis process, your doctor might recommend genetic testing for human leukocyte antigens (HLA-DQ2 and HLA-DQ8). This can be used to eliminate celiac disease as a cause of your symptoms.

Home testing

More than half of people with celiac disease continue to have symptoms even when they're on a strict gluten-free diet, according to the Celiac Disease Foundation.

A commonly cited reason for this is unintentional gluten consumption. If you think that describes your situation, you can take an in-home urine or stool test to determine if you've consumed any gluten in the past 24 to 48 hours.

There are also in-home blood and DNA tests available for celiac disease testing. If you're considering an in-home test, talk to your doctor about accuracy and potential risks. Also check to see if in-home testing is covered by your health insurance.

Who should be screened for celiac disease?

If you're experiencing digestive discomfort or diarrhea for more than two weeks, talk to your doctor about your symptoms and consider asking about celiac disease screening.

The most common symptoms of celiac disease include:

- diarrhea
- weight loss
- fatigue
- gas

Celiac disease symptoms that are not related to digestion can include:

- anemia
- osteoporosis (loss of bone density)
- osteomalacia (softening of bone)
- hyposplenism (reduced function of spleen)
- dermatitis herpetiformis (itchy skin rash with blisters)

Takeaway

If you feel that your digestive issues could be related to celiac disease, talk with your doctor. Even if you're not concerned about celiac disease, if you have been experiencing digestive discomfort or diarrhea for over two weeks, make an appointment with your doctor.

If there is a suspicion of celiac disease, your doctor will most likely start the screening with a tTG-IgA test. The results of that test will direct whether more blood testing or genetic testing should be done.

Testing will often be followed by an endoscopy and biopsy before a gluten-free diet is recommended.

I Don't Have Celiac Disease and I Still Avoid Gluten – Here's Why

Even for those who don't have celiac disease, eating gluten can come with a range of side effects.



Decades ago, I ate a bagel at noon sitting in the sun in my backyard. I woke up three hours later with a fierce sunburn. There was no good reason for me to be so sleepy.

Soon, I realized that bagels and pasta often made me groggy, but I'd still eat wheat products occasionally.

More than 10 years ago, when I was getting attacks of intestinal cramps and diarrhea, my doctor told me to avoid gluten. I didn't even know what "gluten" was then.

Now gluten-free products are everywhere.

But why would so many give up the ordinary versions of favorite foods, like hamburger buns and birthday cake?

For some, it's just an experiment. But many others, like me, have found the switch helps relieve a surprising range of symptoms, from digestive issues to chronic stubborn ailments like fatigue, headaches, muscle aches, and anxiety.

The health of your gut affects your entire body. For some people, gluten can trigger inflammation anywhere – and they feel it.

“If you have inflammation of the brain, you can have anxiety,” Dr. Alessio Fasano, founder of Massachusetts General Hospital's Center for Celiac Research and Treatment, told Healthline.

But simply giving up gluten may not be the right way to address your underlying problem.

“You can't just throw darts,” said Dr. Leo Galland, a New York-based internist who specializes in nutritional approaches to gut healing. He explains that people need an organized approach to identify foods that bother them and eliminate other reasons for their symptoms.

The bottom line: Don't do this alone. Work with a gastroenterologist or internist who's knowledgeable about gluten problems. If your doctor dismisses your concerns, persist or find someone else.

4 reasons why you may feel better going gluten-free

1. About 1 percent of Americans have celiac disease. It's an autoimmune response that causes gluten to trigger your body to attack your own intestinal walls. (Organizations like Beyond Celiac are a great resource for those who have this serious condition, or just want to learn more about it.)
2. Some 6 percent may have “non-celiac gluten sensitivity.” One theory is that they may have an “innate” immune response to gluten, which Fasano describes in detail in his book, “Gluten Freedom.” Although your body is treating gluten as an enemy, this reaction isn't measurable like an allergy or autoimmune response.

3. It might be FODMAPs. You might feel better on a gluten-free diet even if you don't have any immune response to gluten. Instead, you may have a nonimmune reaction to a group of common carbohydrates called fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAPs), which trigger irritable bowel syndrome. Wheat is one of them, so going off it helps you feel better.

4. You might have a wheat allergy. Although very rare, it can potentially cause a range of allergy symptoms, including anaphylactic shock.

Once your gut is in trouble, it's also common to develop issues with other foods, often dairy and soy. People with celiac or non-celiac gluten sensitivity may have to avoid other FODMAPs, too.

In short, the possible causes of your problems imply different treatments, and they also overlap.

You may have another problem

There's no test for the innate immune reaction that may cause non-celiac gluten sensitivity.

And you may have a problem that isn't specific to gluten. One smaller study found 30 percent of people without celiac disease but who ate a gluten-free diet ended up receiving diagnoses other than celiac disease, such as small intestinal bacterial overgrowth.

Other possibilities were fructose and lactose intolerance, microscopic colitis, gastroparesis, and pelvic floor weakness.

"Each of those has its own therapy," Dr. Benjamin Lebwohl, a gastroenterologist and researcher at Columbia University's Celiac Disease Center and co-author of the book "Celiac Disease: An Issue of Gastrointestinal Endoscopy Clinics," told Healthline.

Like many people who avoid gluten, I've received a diagnosis of irritable bowel syndrome (IBS), which affects around 15 percent of people in North America. The standard treatment for IBS is to restrict high-FODMAP foods and perhaps take medication.

A small study with people who weren't celiac sensitive but considered themselves intolerant to gluten found that only 8 percent were really reacting to gluten. However, they all did better when they cut out FODMAPs.

Other research found that the offender was most likely fructan, a subgroup of FODMAPs. Wheat and rye contain fructan, and so do a host of healthy vegetables, like broccoli, Brussels sprouts, cabbage, garlic, onion, artichoke, asparagus, and okra.

"There are certain red flags that make me focus on FODMAPs," Galland said, noting these include bad reactions to apples, garlic, onions, artificial sweeteners, high fructose corn syrup, and wheat.

If you feel better without gluten but still have symptoms like bloating and diarrhea, check out a list of high-FODMAP foods and see which may be affecting you. There are some simple moves that could help, like switching from tea to coffee and from apples and pears to blueberries and cantaloupe.

However, avoiding FODMAPs entirely isn't a long-term diet, Lebowitz notes. You might work with a dietician to cut out these foods and then "cautiously reintroduce foods to identify triggers," he says.

Seasonal allergies can complicate food sensitivities

I usually don't pay attention to FODMAPs because I already don't eat wheat, corn, or dairy, and I didn't want to cut out tea or any vegetables. I also have high blood sugar, and a varied, plant-based diet is advisable to avoid type 2 diabetes [Trusted Source](#). (In general, eating a greater variety of fruits and vegetables is good for your gut.)

However, this spring I paid the price. For several days while on a writing retreat, I had tea every morning and afternoon and ate big bowls of cooked Brussels sprouts or broccoli with avocado and hummus — all high-FODMAP foods. I ended up in full digestive distress, exhausted and anxious with aching muscles, and barely wrote at all.

I had picked the wrong time. "You can get GI [gastrointestinal] symptoms from seasonal allergies," Galland explained, noting that mucus leaks into your digestive tract.



Celiac disease can cause permanent damage if it isn't treated properly

Many people go off gluten and aren't checked for celiac disease. The thought that you might have it may never cross your mind. But it's not uncommon for people with celiac disease to puzzle the doctors who see them when their symptoms first show up.

In his mid-40s, Dr. Chad Shaffer was putting in 100-hour weeks as a chief medical officer and professor of medicine in Kansas City. Then suddenly, over a three-month period, he began losing weight and control of his muscles. He went from crutches to a wheelchair. After he developed a heart arrhythmia, he had an episode of cardiac arrest.

"We thought I had a terminal illness," Shaffer said. Celiac was just one of many blood tests. It turned up positive. After an examination of his gut showed significant damage, he went off gluten.

But he didn't get entirely better and was forced to retire.

Celiac is a serious illness that needs to be monitored over time. You'll need to be 100 percent gluten-free for the rest of your life. Although your intestinal walls should heal once you stop eating gluten, you'll need an endoscopy to check.

If it hasn't healed, you're at a higher risk of developing several forms of cancer, including intestinal lymphoma and small bowel cancer.

In a 2018 study^{Trusted Source}, researchers concluded that people with undiagnosed celiac disease were more likely to develop osteoporosis, chronic fatigue, and thyroid problems.

The only way to identify if you have celiac disease is by testing for it. If you've already gone off gluten, you can do a blood test to check for two known celiac-sensitive genes. Not having either of these genes "rules out celiac [disease] with as much certainty as we have in medicine," Lebwohl says.

If you have a positive result on the gene test and haven't been eating gluten, you'll have to undergo a "gluten challenge" – something many people resist. Around 20 to 30 percent of all people have a celiac-sensitive gene, but only a small fraction of that number develops celiac disease. However, the condition can develop later in life.

Why would the grain that built human civilization cause problems now?

Gluten sensitivity isn't new, and Fasano argues that problems digesting wheat go back to its origins.

Nevertheless, illnesses need to be defined and publicized to identify those who've been living with them. American doctors are becoming more aware of celiac disease and non-celiac immune responses. But there's also evidence that cases of undiagnosed celiac disease are increasing, although the causes haven't been identified yet.

Today, we're eating more wheat built into processed foods. Modern wheat contains more of certain proteins that are known to cause distress in mice with allergies and autoimmune issues.

Significant stress, antibiotics, infections, and other factors may make you more vulnerable as well.

Identifying the problem and making smarter choices

When making dietary changes to test for food sensitivities, it's important to remember the same strategies don't work for everyone. Our microbial inhabitants, which determine our gut health, vary from one person to the next. Your microbiome may even be as unique as a fingerprint.

Any major changes to your diet should be done keeping that in mind. Work with your doctor to find the best solution that's right for you.

12 Simple Tips to Help Eliminate Gluten from Your Diet

Gluten is the collective name for a group of proteins found in grains like wheat, barley, and rye.

Although most people can eat gluten without any issues, it may be harmful to individuals with celiac disease or non-celiac gluten sensitivity.

Those with gluten disorders may experience symptoms like digestive discomfort, headaches, fatigue, weight loss, and dermatitis after eating gluten.

Other people may also benefit from removing gluten from their diet. Fortunately, if you have a gluten-related health condition, removing gluten from your diet will likely improve your symptoms. This article provides 12 simple tips to help you eliminate gluten from your diet.



1. Choose gluten-free grains

Wheat, barley, and rye are popular gluten-containing grains. However, there are plenty of gluten-free grain alternatives.

Examples of gluten-free grains include (4Trusted Source):

- quinoa
- brown rice
- millet
- amaranth
- buckwheat
- oats

Despite its name, buckwheat is a grain-like seed that's unrelated to wheat and naturally gluten-free. Buckwheat can be enjoyed as a cereal or used in recipes for gluten-free baked goods.

Oats are naturally gluten-free but may contain traces of gluten from exposure during processing. If you have celiac disease or gluten sensitivity, choose oats with a certified gluten-free label.

2. Look for a gluten-free certification label

The Food and Drug Administration (FDA) regulates gluten-free claims on food packaging.

A product claiming to be gluten-free must comply with the FDA gluten-free definition by containing less than 20 parts per million (ppm) of gluten. The European Union (EU) has similar legislation for food products labeled as gluten-free.

3. Eat more produce

All fresh fruits and vegetables are naturally gluten-free.

Gluten-free diets may lack micronutrients like folate and magnesium unless gluten-containing products are replaced with other nutrient-dense foods. Including more fresh produce in your diet can help you acquire these nutrients and eliminate gluten.

Here are a few ways to add more fresh produce to your diet:

- ask for a lettuce wrap in place of
- bread
- use spiralized veggie noodles in
- place of regular pasta
- opt for a salad instead of a
- sandwich
- use roasted potatoes or butternut
- squash for a gluten-free side dish
- choose a side of fresh fruit or
- roasted vegetables
- add a piece of fruit to your
- breakfast or eat it as a snack
- use sweet potato
- slices in place of bread

Some processed fruits and vegetables, such as frozen or canned products, may contain gluten as a food additive or thickening agent. It's best to check the label for gluten or wheat if choosing canned, frozen, or dried fruits and vegetables.

4. Clean out your pantry

Evaluate your current pantry items and clean out any products that may contain gluten.

The best way to identify if a product contains gluten is to read the ingredient list. Throw out or donate items that contain grains like wheat, barley, and rye. Check for lesser-known gluten-containing ingredients like malt vinegar, brewer's yeast, and seitan.

Eliminating gluten from your diet can be difficult if other household members don't require the same dietary restrictions.

In this case, consider dedicating a section of your pantry to gluten-free items. This also helps avoid potential cross-contamination and accidental gluten exposure.

You can also avoid accidental exposure by using a separate toaster and washing cutting boards and utensils before preparing your meals.

5. Avoid gluten-containing beverages

Gluten may be present in certain beverages, especially those containing alcohol. Beer is a common source of gluten because it's produced by fermenting gluten-containing grains like wheat or barley. However, there are some gluten-free beers on the market made from ingredients like sorghum or rice.

If you want to drink alcohol on a gluten-free diet, opt for distilled liquors like vodka or gin. Typically, wine is also free from gluten. That said, wine coolers may contain malt barley, a gluten-containing grain.

Most non-alcoholic beverages like coffee, tea, and sparkling water products are gluten-free. Nonetheless, some drinks like pre-made smoothies, coffee drinks, or milkshakes may contain gluten, so it's best to check the label.

6. Bring your own food

If attending a social event, consider bringing your own gluten-free dish.

Accidental gluten exposure is common at social events. Even if a dish is inherently gluten-free, cross-contamination during cooking may pose a risk to people who require strict gluten elimination.

Offer to bring a dish to share with others. Having at least one gluten-free dish to enjoy can reduce social stress and limit potentially harmful gluten exposure.

7. Eat more nuts and seeds

Gluten-free diets are more likely to be deficient in nutrients like zinc, calcium, and fiber.

Nuts and seeds are naturally gluten-free and are great sources of these nutrients

Nuts and seeds to add to your diet include:

- almonds
- cashews
- pecans
- walnuts
- pistachios
- macadamia nuts
- pumpkin seeds
- flax seeds
- chia seeds
- sunflower seeds

You can add nuts or seeds to gluten-free oats, finely grind nuts to use in place of wheat flour, sprinkle seeds over your salad, or blend nuts into nut butter to enjoy with apple slices or celery sticks.

8. Know the different names for wheat

There are many different wheat varieties, which can make it difficult to read food labels. Look for these wheat varieties when assessing a label for hidden sources of gluten:

- durum
- einkorn
- khorasan (Kamut)
- spelt or farro
- triticale

Many types of wheat flour also have different names like semolina, farina, or graham flour. All of these flours contain gluten and must be avoided if you follow a gluten-free diet.

Moreover, common food additives may contain hidden sources of wheat like maltodextrin, caramel color, and modified food starch.

Evaluating the allergens statement on a food label is the easiest way to identify whether a product contains wheat and gluten. This is because the FDA requires foods to clearly state if they contain any of the top eight allergens, such as wheat, on the food label..

9. Limit processed food

Food manufacturers can add gluten to processed foods to improve texture, mouthfeel and shelf life. For example, lunch meat, sausage, baked goods, french fries, and seasoned rice mixes may all contain hidden sources of gluten.

What's more, processed gluten-free products are often higher in fat, sugar, and sodium than regular products. Thus, while these products are gluten-free, they may not be a favorable replacement for whole foods.

Whole foods, such as fruits, vegetables, eggs, nuts, and seeds, are naturally gluten-free. Focus on eating more of these whole foods while limiting your intake of processed food.

10. Cook more meals at home

Restaurants are increasingly offering gluten-free meal options. However, these meals typically come with an added cost, as well as the risk of cross-contamination.

Cooking more meals at home can help you eliminate gluten from your diet, all while benefiting your overall health.

In fact, people who eat home-cooked meals at least 5 times per week eat significantly more fruits and vegetables and are 28% less likely to be overweight than those who eat home-cooked meals less than 3 times per week.

Create a weekly meal plan to stay accountable. Stock your kitchen with gluten-free staples like fresh produce, nuts, seeds, legumes, protein sources like eggs and fish, and various gluten-free grains.

11. Avoid gluten-containing condiments

Condiments and sauces often contain hidden sources of gluten. Food manufacturers can add gluten to condiments to act as a stabilizer, thickener, or emulsifier.

Condiments that may contain gluten include:

- soy sauce
- salad dressing
- malt vinegar
- marinades
- barbecue sauce
- pasta sauce
- Worcestershire sauce
- teriyaki sauce

Reviewing the allergens label on these condiments is helpful. It's important to remember that even if a condiment is wheat-free, it may contain gluten from barley or rye. For example, malt vinegar is not gluten-free because malt is derived from barley.

12. Join a gluten-free community

Following a gluten-free diet may feel isolating. In fact, people with celiac disease may be more likely to suffer from feelings of loneliness, depression, and social phobia.

Joining a gluten-free community is a great way to find resources, community recommendations, and support from other people with similar dietary restrictions.

The National Celiac Association has various chapters around the United States that offer conferences, small meetings, and support for individuals living with celiac disease.

Potential Benefits

The celiac disease diet is required for anyone diagnosed with celiac disease and has many benefits.

Reduces the Symptoms of Celiac Disease

Many people with celiac disease experience uncomfortable symptoms, such as diarrhea, indigestion, abdominal pain, fatigue, and headaches.

Following a gluten-free diet for at least one year has been shown to improve these symptoms in more than 90% of people with celiac disease, significantly improving quality of life.

Intestinal symptoms like diarrhea tend to be the quickest to resolve – with some people experiencing relief after just two days on a gluten-free diet.

Overall, it takes an average of one month to see significant improvements in bowel movements, bloating, and abdominal pain.

Prevents Small Intestinal Damage

For people with celiac disease, eating gluten triggers an autoimmune response that damages the small intestine, where nutrients are absorbed.

Avoiding gluten prevents this autoimmune process, and the small intestine can heal and return to normal function.

This process takes time – so the earlier a gluten-free diet is started, the better.

In one study, up to 95% of children with celiac disease who followed a gluten-free diet for two years no longer showed signs of intestinal damage.

Recovery tends to be slower in adults – with 34–65% achieving gut healing in two years.

However, this number jumps to at least 66% – and up to 90% – after five or more years on a gluten-free diet..

Being vigilant about avoiding gluten is crucial. Exposure to even tiny amounts can hinder the healing of your intestines..

Improves Nutrient Absorption

Nutrient deficiencies are prevalent in people with celiac disease due to poor absorption in the damaged small intestine.

Deficiencies in iron, calcium, magnesium, zinc, vitamin B12, niacin, riboflavin, and folate, as well as vitamins A, D, E, and K, are the most common.

In fact, unexplained iron deficiency anemia is one of the most recognized signs of celiac disease in adults.

Yet, supplementing will not always correct deficiencies in people with celiac disease if their intestines are still damaged and unable to absorb nutrients .

Improves Fertility

Women with celiac disease have higher rates of infertility and may be at a greater risk of miscarriage than women without this condition.

Research suggests that the autoimmune response that gluten triggers in people with celiac disease may be to blame.

However, following a strict gluten-free diet has been found to improve fertility and reduce miscarriage rates.

May Reduce Cancer Risk

Celiac disease is associated with a three-times greater risk of non-Hodgkin's lymphoma – an aggressive form of cancer that occurs in the lymph system .

Several studies have found that diagnosing celiac disease early and following a gluten-free diet can reduce this risk – but more research is needed.

Lowers the Risk of Osteoporosis

Up to 75% of people with untreated celiac disease have lower bone density and a higher risk of osteoporosis.

This may be due to poor calcium and vitamin D absorption, as well as increased inflammation that interferes with the bone-building process (26Trusted Source).

Research shows that diagnosing celiac disease early and starting a gluten-free diet can help stop bone loss and reduce the risk of developing osteoporosis.

Foods to Eat

There are many naturally gluten-free foods to enjoy on the celiac disease diet, including (13Trusted Source):

- Animal proteins: Beef, chicken, dairy products, eggs, game meat, lamb, pork, seafood, and turkey.
- Fats and oils: Avocado, coconut oil, olives, oils, solid fats, and butter.
- Fruits and vegetables: In any form, including fresh, frozen, dried, or canned.
- Gluten-free cereals and pseudocereals: Amaranth, buckwheat, corn, millet, quinoa, rice, sorghum, teff, and wild rice.
- Herbs and spices: All fresh and dried herbs and spices are naturally gluten-free and can be enjoyed liberally.
- Legumes: Beans, lentils, peanuts, peas, and soy.
- Nuts and seeds: Any type, including almonds, cashews, chia, flax, pecans, pepitas, pine nuts, and walnuts.

There's also a wide variety of specialty products, including gluten-free bread, cereals, flours, crackers, pastas, and baked goods.

Foods to Avoid

The only foods that should be avoided on the celiac disease diet are those that contain gluten.

Foods that naturally contain gluten include the following grains:

- Wheat
- Dinkel
- Durum
- Einkorn
- Emmer
- Farina
- Farro
- Graham
- Khorasan (KAMUT®)
- Semolina
- Spelt
- Wheat berries
- Wheat germ
- Wheat bran
- Barley
- Rye
- Triticale (a cross between wheat and rye)

Products made with these ingredients include:

- Breakfast and baked goods: Bagels, biscuits, bread, cornbread, crepes, croissants, donuts, flatbread, flour tortillas, French toast, muffins, naan bread, pancakes, pita bread, potato bread, rolls, and waffles.
- Desserts: Brownies, cake, cookies, pastries, pie crust, and some candy.
- Pasta: Chow mein, couscous, dumplings, egg noodles, gnocchi, ramen noodles, ravioli, soba noodles, udon noodles, and wheat pasta.
- Snacks: Crackers, graham crackers, and pretzels.
- Some beverages: Beer and other malted beverages.
- Other: Breadcrumbs, croutons, wheat flour, barley flour, rye flour, gravy, malt flavoring/extract, panko, sauces thickened with flour, soy sauce, stuffing, and anything with a flour coating, such as chicken tenders or tempura.

Foods that are often cross-contaminated by gluten include:

- Commercially fried foods: Many restaurants fry all of their foods in the same fryer, which can contaminate gluten-free items like French fries.
- Improperly handled gluten-free items at restaurants: Gluten-free items should be prepared with designated gluten-free equipment and a clean pair of gloves.
- Oats: Oats are often processed on the same equipment as gluten-containing grains and may be contaminated unless specifically labeled gluten-free.

Foods that frequently contain hidden gluten include:

- Brown rice syrup: Brown rice is naturally gluten-free, but the syrup is often made with barley malt, which contains gluten. Look for gluten-free varieties.
- Chips: Can be dusted with flour or contain malt vinegar, so check ingredients.
- Ice creams and frozen yogurts: Watch for cookie, cake, or brownie mix-ins.
- Lunch meats: Some brands add starches that contain gluten.
- Marinades and salad dressings: May contain malt vinegar, soy sauce, or flour.
- Meat substitutes: Seitan, veggie burgers, veggie sausages, imitation bacon, and imitation seafood can contain gluten.
- Meats: Some commercially prepared meat mixtures contain gluten or are marinated with gluten-containing ingredients.
- Seasoning packets: May contain gluten-containing starch or flour.
- Soup: Watch for flour thickeners (often used in creamy soups) or barley.
- Stock, broth, and bouillon: Some varieties contain flour.

Sample Gluten-Free Menu

Monday

- Breakfast: Hard-boiled eggs with fresh fruit and almonds.
- Lunch: Lettuce wrap with gluten-free deli meat, potato chips, and guacamole.
- Dinner: Shrimp and vegetable stir-fry with tamari (gluten-free soy sauce) over rice.

Tuesday

- Breakfast: Plain Greek yogurt with sliced fruit, nuts, and honey.
- Lunch: Leftover stir-fry.
- Dinner: Chicken tacos with sautéed peppers and onions served in corn tortillas with refried beans and salsa.

Friday

- Breakfast: Overnight oats made with gluten-free oats, milk of choice, nuts, coconut, and blueberries.
- Lunch: Spinach salad with quinoa, chickpeas, vegetables, and olive oil dressing.
- Dinner: Pizza made with gluten-free crust.

Saturday

- Breakfast: Bacon and eggs with breakfast potatoes and berries.
- Lunch: Leftover pizza and a side salad.
- Dinner: Baked salmon with steamed vegetables and brown rice.

Sunday

- Breakfast: Omelet with mushrooms, peppers, and onions, along with a piece of fruit.
- Lunch: Vegetarian chili topped with cheddar cheese, green onion, and avocado.
- Dinner: Roast beef with potatoes, carrots, and onions.

Potential Pitfalls and Helpful Tips

Following a gluten-free diet is relatively simple, but there are a few common pitfalls to avoid.

Nutrient Deficiencies

In the US, products made with refined flour like bread, crackers, and pasta are required to be fortified with the B vitamins niacin, thiamine, riboflavin, and folic acid.

However, gluten-free versions of these foods are not required to be fortified. This may increase your risk of nutrient deficiencies if you eat a lot of these products .

Additionally, whole-grain wheat, barley, and rye are good sources of fiber, so it's important to consume other fiber-rich foods, like oats, beans, and legumes when you have to avoid gluten.

Expenses

Gluten-free products like bread, baked goods, crackers, and pasta can cost more than double the price of traditional wheat-based items.

However, these specialty items aren't required on the celiac disease diet. You can easily meet your nutrient needs by eating less expensive, naturally gluten-free foods.

If you lack inspiration for what to cook on the celiac disease diet, browse the web for gluten-free recipes or look for a gluten-free cookbook online or at your local library or bookstore.

Less Flexibility

While gluten-free items are becoming more widely available in stores and restaurants, the celiac disease diet can sometimes feel limiting and isolating . This is especially true in social situations that involve food, such as weddings, parties, or dining out with friends.

However, following a gluten-free diet gets easier with time and experience. Research shows that most people are accustomed to the diet after five years . Some tips to make eating out a better experience include reading menus online beforehand, calling restaurants to verify gluten-free options, or bringing at least one gluten-free item to a party.

Staying positive and focusing on the foods you can eat, rather than those you can't, helps make the celiac disease diet more enjoyable.

The Bottom Line

The celiac disease diet is a gluten-free diet that reduces symptoms of the condition, allows your gut to heal, improves nutrient absorption, and decreases your risk of infertility, cancer, and osteoporosis.

Avoid wheat, barley, rye, and anything made with these grains, and focus on naturally gluten-free foods and grains.

While the celiac disease diet can seem expensive and limiting at first, planning ahead and learning to enjoy new foods can make the transition easier.

Brown rice

Although brown and white rice come from the same grain, white rice has had the bran and germ of the grain removed during processing.

Thus, brown rice has more fiber and a higher amount of many micronutrients, making it one of the healthiest gluten-free grains around.

Both varieties of rice are gluten-free, but studies show that replacing white rice with brown rice comes with added health benefits.

In fact, choosing brown rice in place of white rice can lead to decreased risks of diabetes, weight gain, and heart disease (40Trusted Source, 41Trusted Source, 42Trusted Source).

One cup (202 grams) of cooked brown rice contains 3 grams of fiber and 6 grams of protein. It also provides a good portion of your magnesium and selenium needs for the day (43Trusted Source).

Brown rice makes a delicious side dish on its own or can be combined with vegetables and a lean source of protein to create a filling meal.