Why Isn't My Brain Working?

A revolutionary understanding of brain decline and effective strategies to recover your brain's health

BY

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Gluten Sensitivity and Beyond

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Gluten Sensitivity and Beyond

GLUTEN SENSITIVITY SYMPTOMS

- Consuming grains makes you tired and makes it difficult to focus
- Consuming grains makes you bloated
- You feel better when you avoid breads and grains
- You have reactions to grain products

Peggy, 12, suffered from chronic migraines, episodes of vomiting, gastric ulcers, joint pain, and bowel irregularities. It's not surprising she also did poorly in school. Her mother told me she had struggled with some type of health condition her entire life. She was a colicky baby, had chronic ear infections, developed asthma, and went through a period of having seizures that she outgrew. She had seen more doctors by the age of 12 than most adults have seen in their entire life, enduring countless blood tests, imaging studies, and medical evaluations by a multitude of specialists. She had also taken various medications over the years for her symptoms.

Peggy's mother read my thyroid book and incorporated some of the recommendations, which helped Peggy feel much better. This convinced Peggy's mother I was the only health care practitioner who could help her daughter, and they flew across the country for a consultation.

When I first saw Peggy it was obvious she was not growing appropriately. Although she was 12 she looked years younger. Peggy was sweet and behaved as if being in a doctor's office was normal. It's always sad to see a young child display so much experience visiting a doctor's office.

Peggy's mother had been diagnosed with hypothyroidism more than 20 years ago, but after she read my book she asked her doctor to test her for autoimmune Hashimoto's hypothyroidism. The test came back positive and she followed the many strategies in the thyroid book, including adopting a gluten-free diet. For the first time in years she felt energetic and was able to lose weight. Naturally, she was concerned her daughter might also have Hashimoto's or some other autoimmune disorder, and she asked me to look at Peggy's medical file.

Peggy's medical file was four inches thick and included numerous labs and medical tests. My initial concern was Peggy may have a gluten sensitivity or celiac disease. Her lab work showed she had been screened for celiac disease (an extreme form of dietary gluten sensitivity), and the results were negative. Peggy's mother put her daughter on a gluten-free diet for two weeks anyway, but it did not make a difference in her symptoms.

When I examined Peggy I found she had hyperreflexia, or overactive reflexes, in all of her limbs. When I tapped her knee, instead of her leg responding with a small kick her entire body jumped aggressively. She also had severe systemic hyperalgesia, or increased sensitivity to pain. When I stroked her skin anywhere on her body with a pinwheel she felt severe pain and withdrew. She also had severe sensitivity to high-pitched sound and to light. When I tested her eye reflexes with a pen light and her hearing with a tuning fork, she developed immediate head pain and nausea. These findings were not associated with a brain lesion or disease of the nervous system but rather with a metabolic or chemical imbalance that was impacting her brain and nervous system.

I ran a series of tests to evaluate her case, including a more comprehensive gluten sensitivity test, since many children of a parent with Hashimoto's are gluten intolerant. Gluten sensitivity is known to not only trigger autoimmunity, but also directly damage the nervous system. The tests her doctors ran were for classic celiac disease and were not thorough enough to rule out immune reactions to gluten. Additionally, going off gluten for two weeks is not enough for most people to see changes or improvements, especially if they have intestinal permeability or are still eating foods that cross react with gluten.

Peggy's results showed severe reactions to gluten, although not classic celiac disease. Instead, she had elevated antibodies to transglutaminase-6, which indicates an immune response from gluten against the nervous system. Classic celiac disease is associated with antibody elevations of tranglutaminase-2, which indicates a reaction against the intestinal tract. She also had reactions to milk and sesame, which are similar enough in their structure to gluten to create an immune response. Lastly, her labs also indicated intestinal permeability.

Based on her test results we started Peggy on a gluten-free, dairy-free, and sesame-free diet and a nutritional and lifestyle plan to address the intestinal permeability. Her response to the plan was completely life changing. She began to grow. The stomach aches, migraines, and joint pain disappeared. She began excelling in school for the first time.

When I talked to her mother during a follow-up consultation, she was crying and asked me why someone didn't diagnose her daughter properly years ago. I told her at least Peggy was properly diagnosed at age 12 and did not have to wait 30 years like her mother.

I share Peggy's story because she is one of many individuals with a gluten sensitivity who are overlooked by the health care system. Unfortunately, many doctors today are not trained to identify gluten sensitivity and are still stuck on outdated and limited models of celiac disease diagnosis. These models have been thoroughly debated in the scientific literature today and recent research has made it very clear the criteria for diagnosing celiac disease are very limited.

If your brain is not working or if you have a neurological disease, you must be properly tested for the entire spectrum of gluten sensitivity and not just for the limited markers for celiac disease. In this chapter I will teach you all of the key concepts.

Datis Kharrazian, DHSc, DC, MS

No food is a more powerful trigger of neurological issues and autoimmunity than gluten, the protein found in wheat. The average American eats wheat at every meal and we're seeing dramatic increases in gluten sensitivity today.

The term gluten comes from the Latin word for "glue" and it's the glue-like quality that gives wheat products an elastic, chewy texture. Gluten is found in wheat, spelt, barley, rye, kamut, triticale, and malts. Oats are often contaminated with gluten because they are grown in rotation with wheat or processed in the same facilities as wheat.

We define a gluten sensitivity as an exaggerated immune response to gluten that lead to inflammation throughout the body and potentially to an autoimmune reaction, in which the immune system attacks and destroys body or brain tissue.

Celiac disease is a severe reaction to gluten that causes autoimmune destruction of the gastrointestinal tract. I will distinguish between gluten sensitivity and celiac disease further, but they are both an abnormal immune response to gluten.

Gluten sensitivity and gluten-free diets have become very popular today. Many grocery stores have gluten-free sections, and they take up a large part of the aisle in health food stores. The numbers of gluten-free books, blogs, and online products has exploded. But is this really just a health fad, or the result of more awareness and diagnoses? Or are we seeing an actual increase in gluten sensitivity and celiac disease today? Although awareness has certainly grown, research shows the increase is *not* the result of increased detection clinically. Instead, the rates of gluten sensitivity have actually risen dramatically.

A breakthrough study published in *Gastroenterology* in 2009 clearly identified a sharp rise in gluten sensitivity in the United States. Researchers compared blood samples collected between 1948 and 1954 of 9,000 healthy young adults to 13,000 gender-matched subjects in 2009. Their investigation found the prevalence of celiac disease increased dramatically during the past 50 years, from 1 in 700 to 1 in 100. Also, this study only evaluated celiac disease and not the less severe but more common form of an immune reaction to gluten, gluten sensitivity. If researchers had looked for gluten sensitivity as well, I have no doubt the numbers would have been even more dramatic.

If you feel like your brain is not working, you must rule out a sensitivity to gluten. Also, the word gluten is technically a misnomer, as the word *gliadin* more specifically describes the portion of wheat that triggers an immune reaction. But since gluten is most commonly used, I will use both terms in this chapter.

WHAT HAPPENED TO GLUTEN?

The gluten you eat today is not the same gluten you ate as a child, or your parents or grandparents ate. Although not technically genetically modified, gluten has nevertheless been significantly hybridized and deamidated over the years, processes that have rendered it inflammatory to humans. Unlike genetic modification, which inserts or deletes genes, hybridization creates a new protein by combining different strains of wheat. This can alter a protein sequence by as much as 5 percent, making it quite different from the original source. Many people feel the hybridization of wheat has created a "new wheat," one that appears more prone to trigger immune reactions, especially in the brain and nervous system.

Deamidation, which is used extensively in the food processing industry, has also made gluten more immune reactive. Deamidation uses acids or enzymes to make gluten water soluble (it is normally only soluble in alcohol) so it mixes more easily with other foods.

Although deamidation makes wheat easier to use, it has also been shown to create a severe immune response in people. A double-blinded, placebo-controlled study found subjects did not react to native wheat flour but reacted severely to deamidated wheat. The researchers concluded deamidation generates new

substances that activate the immune system. Another study published in the *European Journal of Inflammation* concluded deamidated gluten is a new food compound and may be the major cause of hidden inflammatory responses.

The hybridization and deamidation of wheat appear to play a role not only in the sharp increases of gluten sensitivity and celiac disease, but also in inflammation, degeneration, and autoimmunity of the brain and nervous system.

GLUTEN IS MORE A BRAIN ISSUE THAN A GUT ISSUE

The Dutch pediatrician Willem-Karel Dicke first identified gluten sensitivity in 1950 and termed it "celiac disease." In the 1960s, gastroenterologists identified patterns of destruction characteristic of celiac disease by studying intestinal tissue biopsies. Researchers later found certain gene types called HLA-DQ2 and HLA-DQ8 were associated with an increased risk of celiac disease. Researchers also found specific antibodies associated with celiac disease, such as gliadin and transglutaminase antibodies, which can be measured in the blood.

Over time they developed criteria for diagnosing celiac disease. The basic understanding for years and still held by many today is that only a few people with certain gene types are susceptible to celiac disease and that the destruction caused by gluten is limited to the intestinal tract.

However, studies today challenge these long-held concepts. First, the HLA-DQ2 and HLA-DQ8 celiac genotypes are very limited and cannot be used as sole determinants of gluten sensitivity or celiac disease. Many people who do not have the genotypes still have severe reactions to gluten. Second, many people with gluten sensitivity have silent celiac disease, meaning their symptoms are not intestinal. Instead, they experience reactions to gluten in the brain, thyroid, joints, skin, or other tissues, which are referred to as "extraintestinal manifestations." Finally, the most common area of non-intestinal manifestation of gluten sensitivity is the brain and nervous system.

In fact, one study of patients who manifested gluten sensitivity in the brain found only a third of them also suffered from gastrointestinal disorders. Another study in the journal *Neurology* showed that out of 10 participants with headaches, abnormalities in how they walked, and elevated anti-gliadin

antibodies (gluten sensitivity), seven demonstrated complete resolution of symptoms on a gluten-free diet. The interesting part of this study was six out of the 10 subjects had no intestinal complaints.

According to a recent paper titled *The Gluten Syndrome: A Neurological Disease*, research shows gluten sensitivity not associated with celiac disease or gut damage can nevertheless solely and directly harm the brain and nervous system, leading to a number of different neurological problems. In other words, we are now learning gluten sensitivity destroys the brain and nervous tissue more than any other tissue in the body, including that of the gastrointestinal tract.

So what does all of this mean to you? If your brain is not working, a sensitivity to gluten could be causing an immune assault on your brain. This will lead to brain inflammation and increase the risk for an autoimmune attack in the brain.

Despite the research, many physicians do not understand celiac disease, much less the concepts of gluten sensitivity, silent gluten sensitivity, or extraintestinal manifestations of gluten sensitivity. Your average gastroenterologist is still stuck on the outdated HLA-DQ and intestinal biopsy model for celiac diagnosis and unaware most gluten reactions do not cause gut damage or symptoms. Your average neurologist, on the other hand, has no idea a gluten sensitivity can cause any type of neurological disease.

If you have a neurological disorder or your brain is not working, you need to be tested for gluten sensitivity and not just celiac disease, which I will discuss later in this chapter. But before we go into testing, let me share with you some of the research related to the impact of gluten on the brain.

WHY GLUTEN IS SO HARMFUL TO THE NERVOUS SYSTEM

There has been an explosion of research on gluten and its impact on the nervous system in recent years; the timing of the hybridization and deamidation of grains and the onset of gluten-related diseases has aroused much suspicion about the safety of “new wheat.”

Practitioners around the country are continually astonished by the profound therapeutic effect of a strict gluten-free diet on neurological disorders (the key

word is “strict”). Studies have found associations between gluten sensitivity and disorders in every major part of the nervous system, including the brain, the spinal cord, and the nerves that extend into the arms and feet.

Gluten sensitivity has been shown to be a significant trigger in psychiatric disorders, movement disorders, sensory ganglionapathy, ataxia, general neurological impairment, neuromyelitis, multiple sclerosis, neuropathy, myoclonus, apraxia, myopathy, neuromuscular disease, multiple systems atrophy, cerebellar disease, migraines, hearing loss, cognitive impairment, dementia, restless leg syndrome, and disorders in virtually almost every part of the nervous system evaluated.

The immune system mistakes nervous tissue for gluten

Three main mechanisms appear to cause gluten to assault the nervous system. The first is related to cross-reactivity, a concept in immunology in which the immune system mistakes one protein for another—it appears the protein structure of gluten is similar to protein structures in the nervous system. When you are sensitive to gluten the immune system produces gluten antibodies to tag it for destruction. However, because gluten is similar in structure to nervous tissue, the immune system may accidentally produce antibodies to nervous tissue whenever you eat gluten. In this case, a gluten sensitivity may create an autoimmune attack against the brain or other parts of the nervous system thanks to cross-reactivity.

One can easily test this concept with a test called ELISA, placing the blood of a person with gluten sensitivity into a dish of various neurological tissues and then inspecting the dish for an immune response. A person should not have an immune response to tissues in the body, only to foreign invaders such bacteria and other pathogens. An immune response to self-tissue is called autoimmunity.

Researchers have found gluten cross-reactivity leading to autoimmunity with synapsin, a family of proteins located on neurons that help regulate neurotransmitter release; the brain’s cerebellum, which can cause issues with balance, vertigo, or motor control; and an enzyme found in the brain called glutamic acid decarboxylase (GAD), which may cause symptoms related to anxiety.

Gluten triggers nervous system transglutaminase autoimmunity

Another devastating mechanism gluten can trigger is an immune response against tranglutaminase. Transglutaminases are enzymes that help bind proteins together and are also involved in the digestion of wheat. When looking at autoimmunity triggered by gluten, several transglutaminase enzymes concern us.

Transglutaminase-2 (TG2) is found in the intestinal lining, and TG2 antibodies have long been regarded as a laboratory marker for celiac disease. Celiac disease is an autoimmune disease in which the immune system destroys TG2 in the intestinal lining, thus causing damage, inflammation, and poor absorption of nutrients. Basically, when inflammation damages the gut lining, transglutaminases are found in the debris field. The body reacts to them and tags them with antibodies.

Transglutaminase-3 (TG3) is found in the skin, and a gluten-triggered autoimmune reaction to TG3 may lead to a skin disorder known as dermatitis herpetiformis, which presents as itchy red blisters frequently found on the knees, elbows, buttocks, and back, although they can appear elsewhere on the body.

When it comes to brain health, we want to be aware of the more recently discovered transglutaminase-6 (TG6), which is found throughout the central nervous system. Gluten can trigger immune reactivity to TG6, leading to autoimmune destruction of brain and nervous tissue.

Also, transglutaminase is used by the food processing industry to tenderize meat and as a meat glue to hold processed meats together in distinct shapes. People with positive transglutaminase antibodies may react to this food additive.

Gluten can cause a leaky blood-brain barrier

The third mechanism is that immune reactions to gluten can break down the blood-brain barrier, the thin lining that protects the brain, and lead to what is called “leaky brain.” A healthy blood-brain barrier prevents pathogens from getting into the brain but allows in necessary compounds, such as precursors for neurotransmitters. A leaky brain can allow in pathogens that increase the risk of

autoimmune reactions in the brain and nervous system. I describe this more in Chapter Nine.

UNDERSTANDING GLUTEN TESTING

Different types of testing for gluten sensitivity exist, including genetic testing, intestinal biopsy evaluation, and antibody testing. As we have discussed, an immune reaction to gluten does not have to involve either the gut or specific genotypes, as many people develop neurological disorders instead. Therefore, it is not necessary to perform an intestinal biopsy or gene testing to evaluate gluten sensitivity.

A blood, saliva, or stool test that screens for immune antibodies to gluten are the established methods for identifying gluten sensitivity. Stool testing for gluten sensitivity has little evidence in the literature, so I do not use it or endorse it at this point. Most doctors screen for gluten sensitivity using blood tests, but saliva tests have shown great promise in terms of their reliability.

Blood testing for gluten sensitivity involves placing samples of your blood in a dish of gluten proteins and seeing whether antibodies develop, an indication gluten activates your immune cells and you have gluten sensitivity.

The problems and solutions with gluten sensitivity testing

Testing for a gluten sensitivity is much more complex than most people and the standard health care model realize. This is because people can react to a number of different portions of the gluten protein. Most labs only test for antibodies to a portion of gluten called “alpha gliadin,” which, thanks to current research, we now know is extremely limited and produces many clinically negative results. If you have symptoms that suggest a gluten sensitivity but your gluten test came back negative, you may want to get tested again with a more thorough evaluation using the information below.

Gliadin

Gluten is made of a sticky portion called “glutenin” and a protein portion called “gliadin.” Gliadin is further broken down into alpha, omega, and gamma gliadians. As I mentioned before, most labs only test for alpha gliadin antibodies, which is most commonly associated with celiac disease. Even worse, they do not

report this limitation in test results. The reports usually state “gliadin” antibody, but do not specify it is *alpha* gliadin. The result often comes back negative, doctors tell patients they can eat gluten, and patient health further deteriorates. When the patient finally tests for the other branches of gluten, the results show severe gluten sensitivity. I have seen this happen many times.

Glutenin

Glutenin, the sticky portion, makes up 47 percent of the total protein content of wheat and is responsible for the strength and elasticity of wheat dough. Most labs do not test for glutenin sensitivity because it was believed glutenin is not immune reactive. However, this has been disproven. Many people have severe reactions to glutenin but show normal results on the basic gliadin antibody test.

Deamidated gluten

As I mentioned earlier, deamidation is an acid or enzymatic treatment used by the food processing industry to make wheat water soluble so it mixes easily with other foods, and deamidated gliadin has been shown to trigger a severe immune response in people. Many people will never test positive on a conventional gliadin antibody test, but will have profound immune reactions to deamidated gliadin. If you suffer from impaired brain function, testing for deamidated gluten is critical.

At this point, I hope you can see how gluten antibody testing conducted by most labs today captures only a small part of the picture, leading to many improper diagnoses and the continuation of patient suffering. A test should screen for an immune reaction to the alpha, omega, and gamma branches of gliadin as well as glutenin and deamidated gluten.

Lectins

This may seem like more than enough for which to test, but a couple of other components of wheat have been identified as immune reactive. Many people who react to wheat do not react to the gluten portion of wheat. Instead they react to the *lectin* portion. Lectins are substances that bind sugars and carbohydrates together. In wheat they are called wheat germ agglutinin (WGA).

The highest concentration of WGA is found in whole wheat or sprouted wheat, popular among health enthusiasts. WGA can pass through the blood-brain barrier

and attach to the myelin sheath, the protective coating on nerves. This can inhibit nerve growth factor, a chemical critical for neuron growth and health. Many people never test positive for gluten antibodies but have a WGA sensitivity. For these people eating lectins may cause a severe inflammatory response and destroy neurons.

Opioids

Lastly, people may react to gluten opioids, which is different than a reaction to gliadin, glutenin, or WGA. An immune response to opioids takes place in the nervous system and can be measured by antibodies to *gluteomorphin* and *prodynorphin*. Gluteomorphin is an opioid peptide formed during the digestion of gluten. Prodynorphin is an opioid that is the basic building block of endorphins.

If a person has elevated antibodies to these compounds gluten may cause a neurological reaction. The most difficult thing about an opioid sensitivity is that going gluten-free can cause severe withdrawal symptoms, including depression, mood swings, or abnormal bowel activity. It is similar to withdrawal from opioid drugs such as heroin. If this occurs the person must hang in there for a couple of weeks on a strict gluten-free diet and deal with the withdrawal symptoms until they've kicked the gluten addiction.

Transglutaminase

The last issue to cover with gluten sensitivity testing is transglutaminase. Positive transglutaminase antibodies indicate gluten triggers autoimmunity.

There are three major transglutaminases: TG2, TG3, and TG6.

- TG2 is found in the intestinal tract and elevated TG2 antibodies indicates villous atrophy (destruction of the tiny finger-like projections in the small intestine that absorb food) and destruction of the intestinal lining.

- TG3 is found in the skin and is associated with skin outbreaks triggered by gluten, such as dermatitis herpetiformis.

- TG6 is found in the nervous system and is associated with neurological destruction triggered by gluten.

The problem with labs today is they test only for antibodies to TG2, the intestinal transglutaminase, which indicates an autoimmune reaction in the gut. They also list the test results as “transglutaminase” and never specify it is only TG2. If you have neurological issues possibly stemming from gluten, you also need to evaluate TG6.

Also, it’s important to test additionally for transglutaminase bound to gliadin or the test may miss transglutaminase antibodies, possibly resulting in a clinically negative result. Most labs only test for transglutaminase not bound to gliadin.

You can now see how flawed and limited gluten testing is today and why so many people continue to suffer despite a negative celiac test. The most common tests my patients have done before they come to my office are an isolated alpha gliadin and TG2. As you now know, this is not nearly enough information, as many people have severe immune reactions to other types of gluten or may produce antibodies to a different transglutaminase enzyme.

In summary, a complete gluten antibody screen should include:

- alpha gliadin
- omega gliadin
- gamma gliadin
- deamidated gliadin
- wheat germ agglutinin (WGA)
- gluteomorphin
- prodynorphin
- transglutaminase-2 (TG2)
- transglutaminase-3 (TG3)
- transglutaminase-6 (TG6)

This is the panel I use for my patients, and it has revealed countless misdiagnosed issues of gluten sensitivity. This panel is only available through Cyrex Labs (cyrexlabs.com), and it is called the Wheat/Gluten Proteome Sensitivity and Autoimmunity Panel.

If the test shows you are gluten sensitive you should avoid gluten at all costs. If you have positive reactions to any of the transglutaminases, it means you have an autoimmune reaction and should consider further screening for antibodies to neurological tissue if you suffer from brain decline. I discuss this in detail in Chapter Eleven.

GOING GLUTEN FREE

Going gluten free may seem difficult at first, especially if you regularly eat fast food and processed food. However, if you already eat a whole foods diet, it's not that difficult. Many gluten-free resources are available today, some of which are listed on my web site.

Sources of Gluten

- Wheat
- Barley
- Rye
- Spelt
- Kamut
- Oats (except from a gluten-free oat farm)

Foods suspected to cross-react with gluten (the immune system recognizes them as gluten)

- Casein (milk protein)
- Corn
- Oats (including gluten-free)
- Some brands of instant coffee

Hidden sources of gluten

- Modified food starch
- Food emulsifiers
- Food stabilizers
- Artificial food coloring
- Malt extract
- Dextrins
- Clarifying agents in some red wines

Commonly overlooked sources of gluten

- Processed condiments (ketchup, mustard, salad dressing)
- Deli meats
- Beer
- Soy sauce
- Imitation crab meat
- Shampoos

Transglutaminase is an enzyme used in the food industry to tenderize poor quality meat for cheap food or fast foods. It is not typically found in meats in grocery store meat departments or normal steakhouses. The food industry also uses transglutaminase to form meat into perfect shapes. Have you ever seen chicken nuggets that all look the same? If so, they probably used transglutaminase. If you have an immune response to transglutaminase, you may have an immune cross-reactive response to food industry transglutaminase and notice symptoms of inflammation if you eat it.

Going gluten free can be as simple as avoiding processed and fast foods, eating a diet of meats, vegetables, fruits, and using gluten-free condiments. If you have a confirmed gluten sensitivity and feel going gluten free is too difficult, it is time for you to put this book down and realize your brain has no chance, as you will continue to get worse.

You should also know there is no such thing as being “90 percent gluten free” or “pretty good,” or “almost gluten-free.” It is like saying you are 90 percent pregnant. You either are or you are not. If you are emotionally attached to gluten, you need to get over it and get serious to protect the health of your brain.

Getting serious means learning how to incorporate a gluten-free diet and gluten-free products into your lifestyle. It means when you eat out you cannot always trust the server or the chef, and you must stick to meat and vegetable dishes without heavy or processed sauces. It also means you must be patient and committed if family members give you a hard time at holiday gatherings. It can be challenging until you find your safe snacks, meals, and restaurants, and

you often may need to prepare food in advance to bring along instead of eating out. Once you figure out your new routine, it becomes easier and easier. As you become established in your gluten-free lifestyle, you will get to the point where you don't even miss it.

Most people who react to gluten notice a change in their well-being within a week of adopting a gluten-free diet, though some will take longer. It may take several weeks or even months for the immune response to gluten to calm down, which is why cheating or small exposures can sabotage the entire program. "Just a bite" triggers a domino-effect immune response that can last for long periods of time, so please be strict.

WHEN GOING GLUTEN FREE IS NOT ENOUGH

Unfortunately, going gluten free alone may not be enough to manage declining brain function, autoimmunity, or inflammation. This is because proteins in other foods can cross-react with gluten. Cross-reactivity means the proteins in certain foods are similar enough to those in gluten to trigger a reaction.[54] Foods known to commonly cross-react with gluten include casein (the dairy protein), yeast, oats, sesame, and some brands of instant coffee.

The food that most commonly cross-reacts with gluten is casein. This is not to be confused with a lactose intolerance. Lactose is the sugar portion of milk whereas casein is the protein. Lactose intolerance is a condition in which some people lack the enzymes to digest milk sugars. It is not the same as an immune response to casein.

One study found 50 percent of patients with gluten sensitivity experienced only partial remission of symptoms on a gluten-free diet because they had a cross-reactivity to milk. I have personally witnessed countless cases of individuals who needed to give up both gluten and dairy for a positive health response. Also, it's important to test for different antibodies to milk protein or you may miss a dairy sensitivity. These include alpha-casein, beta-casein, casomorphin, and milk butyrophilin.

The other common cross-reactive foods—oats, yeast, sesame, and some brands of instant coffee—can also be an issue. If your symptoms are not improving on a

gluten-free diet you many need to get tested for these cross-reactive foods or simply avoid them completely.

The other main issue with going on a gluten-free diet is many people begin eating more of other grains, such as corn, rice, or quinoa, and develop sensitivities to those grains. This happens all the time with gluten-sensitive people. If you are gluten sensitive and have been on a strict gluten-free diet with minimal results, you may be sensitive to other grains.

Cyrex Labs offers a panel that checks for the foods that most commonly cross-react with gluten. It also screens for common sensitivities to other grains and non-gluten foods and is called the Gluten-Associated Sensitivity and Cross Reactive Foods Array 4.

Foods tested on the Cyrex Array 4 food sensitivity panel

(an [X] indicates a food that commonly cross-reacts with gluten;
a [*] indicates the food is often contaminated with wheat during the processing of the food)

[X] Rye, barley, spelt, Polish wheat
[X] Cow's milk
[X] Alpha-casein and beta-casein (milk proteins)
[X] Casomorphin (peptide created during digestion of milk protein
that produces an opioid affect in the nervous system)
[X] Milk butyrophilin (a protein in milk fat)
[X] Whey protein
[X] Milk chocolate
[X,*] Oats
[*] Some brands of prepackaged, preground, and instant coffee are contaminated with gluten
[X] Yeast
Sesame
Buckwheat
Sorghum
[X] Millet
Hemp

Amaranth
Quinoa
Tapioca
Teff
Soy
Egg
[X] Corn
[X] Rice
Potato

I have found this panel makes it easy to quickly identify which cross-reactive and gluten-free foods must be avoided on a gluten-free diet. If you do not have access to the testing, then follow a diet eliminating the entire list of grains, which is beneficial anyway if you have intestinal permeability, or leaky gut.

How to get the most out of your food sensitivity panel

To get the most out of your Cyrex food sensitivity panel, or any food sensitivity panel, it's important to know some immune basics.

A food sensitivity panel screens for antibodies (Cyrex measures IgA and IgG) to foods, and these antibodies take time to develop.

Antibodies are proteins the immune system makes to tag an antigen, or harmful invader. Once an antibody tags an antigen, the immune system knows to destroy and remove it. This immune reaction is very useful in the case of a virus. However, if it is happening against a food you eat at almost every meal it can cause inflammation, immune imbalances, and raise your risk of developing or worsening autoimmune disease.

In the event of a sensitivity, it takes about one month after eating a particular food for positive antibodies to show up on a test. If you have not consumed a food in the last three to four months, it most likely will not produce positive antibodies, even though you may be sensitive to it. For example, someone could be sensitive to teff, but because they rarely eat it, it may not show up as positive on the test.

What to do with your test results

You got your test results back, now what? You need to immediately eliminate the foods that showed positive on the test. Foods that are cross-reactive with gluten should be permanently avoided, particularly if you also tested positive for transglutaminase antibodies. If you tested negative for transglutaminase antibodies it's possible you may be able to eat these foods again after repairing leaky gut, but it depends on the individual.

The remaining foods are foods to which you have developed a sensitivity. Upon restoring gut health and reducing your overall immune load, it's possible you also may be able to eat these foods again in the future.

Many people with gluten sensitivity and gastrointestinal inflammation develop a leaky gut. As discussed in Chapter Nine, you can test for leaky gut using a panel from Cyrex Labs called the Intestinal Antigenic Permeability Panel. The dietary restrictions to repair leaky gut, which are discussed in the next chapter, include the removal of gluten, dairy, and all grains. Results can be profound.

Although these dietary changes can seem severe at first, they are the foundation to lowering overall inflammation and taming autoimmune reactions. Many people find that as their health improves they actually begin to love their new way of eating and how good it makes them feel.

CHAPTER SUMMARY

- No single dietary protein is a more potent trigger of neurological dysfunction and neurological autoimmunity than gluten, the protein found in wheat. We're seeing dramatic increases in the number of people sensitive to gluten in the United States. Research shows gluten sensitivity has risen sharply in the last 50 years.
- The gluten you eat today is not the same grain it once was. Gluten has been significant hybridized and deamidated over the years. Hybridization has created a "new wheat" that appears to trigger immune reactions, especially in the brain and nervous system. Deamidation, which is used by the food processing industry to make wheat water soluble, has been shown to cause a severe inflammatory process in people.

• The criteria for diagnosing celiac disease and gluten sensitivity are either outdated or incomplete. HLA-DQ2 and HLA-DQ8 celiac genotypes are very limited and cannot be used as sole determinants of gluten sensitivity or celiac disease. Many people who do not have the genotypes still have severe reactions to gluten. Second, many people with gluten sensitivity have silent celiac disease, meaning they do not manifest intestinal symptoms. Instead, the immune reaction to gluten is experienced in other tissues, such as the brain, thyroid, joints, or skin. Lastly, the most common area of non-intestinal manifestation of gluten sensitivity is the brain and nervous system.

• Despite the research, many physicians do not even understand celiac disease, much less such concepts such as non-celiac gluten sensitivity, silent gluten sensitivity, or extraintestinal manifestations of gluten sensitivity. Your average gastroenterologist is typically not aware of gluten reactions that do not cause intestinal destruction. Your average neurologist has no idea a gluten sensitivity can cause any type of neurological disease.

• Studies have found associations between gluten sensitivity and disorders in every major part of the nervous system, including the brain, the spinal cord, and the peripheral nerves that extend into the arms and feet. Countless practitioners all over the country and I are continually astonished by what a profound therapeutic effect a strict gluten-free diet has on all types of neurological disorders.

• Three main mechanisms appear to cause gluten to assault the nervous system. The first is that the immune system mistakes nervous tissue for gluten. Eating gluten may trigger an autoimmune attack against brain or nerve tissue. Another mechanism is that gluten can trigger immune reactivity to transglutaminase-6, leading to autoimmune destruction of neurons in a reaction similar to celiac disease. Lastly, immune reactions to gluten can also break down the blood-brain barrier, the thin lining that protects the brain, and lead to what is called “leaky brain.”

• Gluten is made of a sticky portion called glutenin and a protein portion called gliadin. Gliadin is further broken down into alpha, omega, and gamma fractions. However, most labs only run an isolated alpha gliadin test. This means most people receive incomplete gluten sensitivity testing and may not be diagnosed properly.

- A complete gluten antibody screen should include:
  - alpha gliadin
  - omega gliadin
  - gamma gliadin
  - deamidated gliadin
  - wheat germ agglutinin
  - gluteomorphin
  - prodynorphin
  - TG2
  - TG3
  - TG6

- Going gluten free alone may not be enough to manage declining brain function, autoimmunity, or inflammation. This is because proteins in other foods can cross-react with gluten. Cross-reactivity means the proteins in certain foods are similar enough to those in gluten to trigger a reaction.

- If you have a gluten sensitivity and are exposed to gluten, several natural enzymes and compounds can reduce the adverse reaction and help you recover faster. These natural compounds help degrade the gluten protein to reduce the intensity and duration of the immune response. They include the enzyme DPP-IV and the flavonoids lycopene, apigenin, quercetin, luteolin.

- If you have a confirmed gluten sensitivity and feel going gluten free is too difficult, it is time for you to put this book down and realize your brain has no chance and you will continue to get worse.