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3 Ounces of This a Day May Be Harming Your Brain

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Eating wheat may not be beneficial to your health. Among many other reasons, each grain contains about one microgram of Wheat Germ Agglutinin (WGA). Even in small quantities, WGA can have profoundly adverse effects. It may be pro-inflammatory, immunotoxic, cardiotoxic ... and neurotoxic.



According to an article on Green Med Info:

“WGA can pass through the blood brain barrier (BBB) through a process called ‘adsorptive endocytosis’ ... WGA may attach to the protective coating on the nerves known as the myelin sheath and is capable of inhibiting nerve growth factor which is important for the growth, maintenance, and survival of certain target neurons. WGA binds to N-Acetylglucosamine which is believed to function as an atypical neurotransmitter functioning in nociceptive (pain) pathways.”

Sources:

- » [Green Med Info](#)
- » [Biological Psychiatry March 1984;19\(3\):385-99](#)
- » [Scandinavian Journal of Gastroenterology October 2010; 45\(10\):1197-202](#)
- » [Biological Psychiatry July 1 2010; 68\(1\):100-4](#)

Dr. Mercola’s Comments:

Most people believe that grains are a wholesome part of a healthy diet, particularly whole grains, such as whole wheat. Whole grains are also one of the relatively few foods that are [allowed to make health claims](#) on their labels, relating whole grains with a reduced risk of heart disease and certain cancers.

Unfortunately, there's a large body of evidence indicating that whole grains, and whole wheat in particular (yes even organic), can contribute to significant health problems—both physical and mental. This evidence, however, has not registered with the U.S. Department of Health and Human Services, the U.S. Department of Agriculture (USDA), or the Food and Drug

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Administration (FDA)—the first two of which developed the [dietary guideline to consume three or more ounces of whole grain](#) products per day.

When you begin to review the evidence stacked up against whole grains, it becomes rather self-evident that our reliance on wheat and other grains may be one of the primary culprits for the poor health of so many.

Here, my primary focus will be on the *mental health* impacts of wheat, but for even more information about why wheat isn't the health food you've been lead to believe, please [review the two articles referenced above](#), and the long list of related studies.

The Side Effects of Wheat Consumption—It's Not Just about Celiac Disease

Many of you may be familiar with [Celiac disease \(CD\)](#), a gastrointestinal disorder characterized by intolerance to wheat gluten. According to [statistics from the University of Chicago Celiac Disease Center](#), an average of one out of every 133 otherwise healthy people in the United States suffers from CD. However, an estimated *20-30 percent of the world's population* may carry the genetic susceptibility to celiac disease—and the way to avoid turning these genes 'on' is by avoiding gluten.

When you consider that undiagnosed CD is associated with a nearly four-fold increased risk of premature death, the seriousness of this food sensitivity becomes quite evident. The primary disease mechanism at play is *chronic inflammation*, and chronic inflammatory and degenerative conditions are endemic to grain-consuming populations.



However, other rampant health afflictions include depression, ADD/ADHD, and Alzheimer's disease, just to name a few. As it turns out, excessive wheat consumption may play a significant role here as well. In fact, there's evidence suggesting that [gluten sensitivity may be at the root of many neurological- and psychiatric conditions](#).

The Toxic Effects of Wheat Germ Agglutinin (WGA)

Wheat contains high amounts of wheat germ agglutinin (WGA); a glycoprotein classified as a lectin, which is largely responsible for many of wheat's ill effects. Other grains high in lectins include rice, spelt, and rye.


Interestingly enough, the *highest* amounts of WGA is found in *whole* wheat, including its sprouted form, which is touted as being the most healthful form of all... Aside from high amounts of WGA, wheat also contains a number of other potentially health-harming components, including:

- Gliadin (an alcohol soluble protein component)

- Gliadomorphin (exorphins, or group of opioid peptides that form during digestion of the gluten protein)
- Enzyme inhibitors

The traditional ways of addressing many of these anti-nutrients is by sprouting, fermenting and cooking. However, lectins are designed to withstand degradation through a wide range of pH and temperatures. WGA lectin is particularly tough because it's actually formed by the same disulfide bonds that give strength and resilience to vulcanized rubber and human hair.

Furthermore, because lectins are so small, and hard to digest, they tend to bioaccumulate in your body, where they can interfere with biological processes. WGA is particularly troublesome in this regard. Studies indicate it has a number of health-harming characteristics and activities:

<p>Pro-inflammatory--WGA stimulates the synthesis of pro-inflammatory chemical messengers (cytokines) in intestinal and immune cells, and has been shown to play a causative role in chronic thin gut inflammation.</p>	<p>Immunotoxicity--WGA induces thymus atrophy in rats, and anti-WGA antibodies in human blood have been shown to cross-react with other proteins, indicating that they may contribute to autoimmunity. In fact, WGA appears to play a role in celiac disease (CD) that is entirely distinct from that of gluten, due to significantly higher levels of IgG and IgA antibodies against WGA found in patients with CD, when compared with patients with other intestinal disorders.</p> 
<p>Neurotoxicity-- WGA can cross your blood brain barrier through a process called "adsorptive endocytosis," pulling other substances with it. WGA may attach to your myelin sheath and is capable of inhibiting nerve growth factor, which is important for the growth, maintenance, and survival of certain target neurons.</p>	<p>Excitotoxicity-- Wheat, dairy, and soy contain exceptionally high levels of glutamic and aspartic acid, which makes them all potentially excitotoxic. Excitotoxicity is a pathological process where glutamic and aspartic acid cause an over-activation of your nerve cell receptors, which can lead to calcium-induced nerve and brain injury. These two amino acids may contribute to neurodegenerative conditions such as multiple sclerosis, Alzheimer's, Huntington's disease, and other nervous system disorders such as epilepsy, ADD/ADHD and migraines.</p>

<p>Cytotoxicity—WGA has been demonstrated to be cytotoxic to both normal and cancerous cell lines, capable of inducing either cell cycle arrest or programmed cell death (apoptosis).</p>	<p>Disrupts Endocrine Function—WGA may contribute to weight gain, insulin resistance, and leptin resistance by blocking the leptin receptor in your hypothalamus. It also binds to both benign and malignant thyroid nodules, and interferes with the production of secretin from your pancreas, which can lead to digestive problems and pancreatic hypertrophy.</p>
<p>Cardiotoxicity—WGA has a potent, disruptive effect on platelet endothelial cell adhesion molecule-1, which plays a key role in tissue regeneration and safely removing neutrophils from your blood vessels.</p>	<p>Adversely effects gastrointestinal function by causing increased shedding of the intestinal brush border membrane, reducing the surface area, and accelerating cell loss and shortening of villi. It also causes cytoskeleton degradation in intestinal cells, contributing to cell death and increased turnover, and decreases levels of heat shock proteins in gut epithelial cells, leaving them more vulnerable to damage.</p>

The Gut-Brain Connection

Most people fail to realize that your gut is quite literally your second brain, and actually has the ability to significantly influence your:

- Mind
- Mood
- Behavior

As you can see from the listing of toxic influences above, wheat germ agglutinin (WGA) can damage both your gut and your brain in various ways. But damage to your gut can also, by virtue of the gut-brain connection, alter your mind, mood and behavior all by itself... Anxiety and depression are actually part of the signs and symptoms of celiac disease, for example.

The gut-brain connection is well-recognized as a basic tenet of physiology and medicine, so this isn't all that surprising, even though it's often overlooked. There's also a wealth of evidence showing gastrointestinal involvement in a variety of neurological diseases. With this in mind, it should also be crystal clear that nourishing your gut flora is extremely important, from cradle to grave, because in a very real sense you have *two brains*, one inside your skull and one in your gut, and each needs its own vital nourishment.

Your gut and your brain are actually created out of the same type of tissue. During fetal development, one part turns into your central nervous system while the other develops into



your enteric nervous system. These two systems are connected via the vagus nerve, the tenth cranial nerve that runs from your brain stem down to your abdomen. This is what connects your two brains together, and explains such [phenomena as getting butterflies in your stomach](#) when you're nervous, for example.

Your gut and brain work in tandem, each influencing the other. This is why your intestinal health can have such a profound influence on your mental health, and vice versa. As a result, it should be obvious that your diet is closely linked to your mental health. Furthermore, it's requires almost no stretch of the imagination to see how improper nutrition can have an adverse effect on your mood and subsequently your behavior.

How Wheat May Sabotage Your Mental Health

As for the impact of wheat and other grains on your mood and mental health, a number of [studies indicate that wheat can have a detrimental effect](#), promoting depression and even more serious mental health problems such as schizophrenia. One recent [study, published in the Scandinavian Journal of Gastroenterology](#) last year, found that even those who do *not* present symptoms of celiac disease may have antigliadin antibodies, which was found to increase the risk of depression in elderly individuals.

Increased immune sensitivity to gluten has also been reported in schizophrenic patients, and the connection between gluten intolerance and schizophrenia has been established for over 20 years!



[According to a 1984 study:](#)

"If, as hypothesized, neuroactive peptides from grain gluteins are the major agents evoking schizophrenia in those with the genotype(s), it should be rare if grain is rare. To test this, we analyzed the results of our clinical examinations (e.g., kuru) and observations of anthropologists on peoples consuming little or no grain.

Only two overtly insane chronic schizophrenics were found among over 65,000 examined or closely observed adults in remote regions of Papua New Guinea and Malaita, Solomon Islands, and on Yap, Micronesia. In preneuroleptic Europe over 130 would have been expected.

When these peoples became partially westernized and consumed wheat, barley beer, and rice, the prevalence reached European levels. Our findings agree with previous epidemiologic and experimental results indicating that grain gluteins are harmful to schizophrenics."

[Another more recent study](#) found that:

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"Individuals with recent-onset psychosis and with multi-episode schizophrenia who have increased antibodies to gliadin may share some immunologic features of celiac disease, but their immune response to gliadin differs from that of celiac disease."

Wheat—A Real "Downer"

One mechanism that can help explain the mysterious connection between wheat and mental health problems is the fact that wheat inhibits production of serotonin.

Neurotransmitters like serotonin can be found not just in your brain, but also *in your gut*. In fact, the greatest concentration of serotonin, which is involved in mood control, depression and aggression, is found in your intestines, not your brain!

Therefore, it actually makes perfect sense to nourish your gut flora with probiotic foods and supplements to maintain optimal serotonin function, as it can have a profound impact on your mood, psychological health, and behavior. This conclusion is supported by [a recent animal study](#), which found that the absence or presence of beneficial gut microorganisms during infancy *permanently alters gene expression*—specifically genes and signaling pathways involved in learning, memory, and motor control.

This suggests that gut bacteria is closely tied to early brain development and subsequent behavior!



These behavioral changes could be reversed as long as the mice were exposed to normal microorganisms *early in life*. But once the germ-free mice had reached adulthood, colonizing them with beneficial bacteria did not influence their behavior. According to Dr. Rochellys Diaz Heijtz, lead author of that study:

"The data suggests that there is a critical period early in life when gut microorganisms affect the brain and change the behavior in later life."

The implications could be profound when you consider how many processed wheat products are consumed today, and from a very early age... Not only may our addiction to grains be fueling gastrointestinal diseases like celiac disease, along with wheat allergies, obesity, and diabetes; it may also contribute to deteriorating mental health, as well as neurodegenerative diseases like Alzheimer's.

It's definitely worth considering... especially if you're currently suffering with depression or any other psychiatric ailments.

Aside from that, ALL types of grains clearly contribute to insulin and leptin resistance, which are the primary underlying causes for most, if not all, chronic diseases—from diabetes to cancer. That alone is reason enough to restrict your intake of grains. But wheat may be of particular concern, for all the reasons discussed above.

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