The Gluten-Free Revolution!
The secrets behind feeling better!

The Gluten Effect

Gluten, like all proteins, is composed of hundreds of building blocks called amino acids which are linked together to form the protein molecule. In most people, the gluten molecule is broken down by digestive enzymes in the small intestine and the simple amino acids of which gluten is composed are absorbed by the intestinal absorptive cells to provide nutrition for the rest of the body. This is not the case in celiac disease, the gluten remains undigested.

The undigested gluten possesses toxic properties which actually injure the intestinal cells of the small intestines. The molecules inside the gluten penetrate the intestinal cell membrane, reach the underlying layer of white blood cells and cause an immune response. The products of the immune response, including antibodies, injure the intestinal cells and cause them to change their shape and to function abnormally. Further investigation has found that it is not the gluten alone which results in intestinal dysfunction.

Once the small intestine has been affected, the flattened or blunted intestinal surface makes it impossible for normal absorption of any food eaten. The most disquieting development in the gluten-celiac picture is the fact that celiacs, whether or not they respond favorably or unfavorably to gluten withdrawal, exhibit other serious intestinal problems which a gluten-free diet does not appear to be effective in preventing.

Studies show that an inability to digest disaccharides can compound the sensitivity to gluten. The flattened intestinal absorptive cells have lost their ability to perform the last step in the digestive process which is to split disaccharides. Many researchers have confirmed the fact that in celiac patients, ability to digest disaccharides, especially lactose, is severely limited.

Once the small intestine is injured, the problem of malabsorption occurs. Faulty absorption or ingestion of vitamins and minerals affect the function of the nervous system, and triggers an immune response. It is well known that compounds (undigested food particles and microbes) arising in the intestinal tract can enter the bloodstream and cross the blood brain barrier. All undigested and unabsorbed carbohydrates (starch and sugar) have the greatest influence on the growth of intestinal microbes.

This immune response is considered an innate immune response, an ancient form of defense coded in the genes as an inherited trait. This innate immune response could stimulate the production of antibodies and cytokine, initiators of an inflammatory response, part of an adaptive immune response. All autoimmune diseases are linked, and most of them have been linked to beginning in the ‘gut’.

Keeping disaccharide ingestion to a minimum is important to becoming and staying healthy. By avoidance lactose, sucrose, maltose and isomaltose many patients can begin a healing process in the small intestine.

Single Sugars (monosaccharides)
These sugars require no further splitting in order to be transported from the intestine into the bloodstream. They are glucose, fructose, and galactose. Glucose and fructose are found in honey, fruits, and some vegetables. Galactose is found in lactose-hydrolyzed milk (LHM) and in yogurt.
**Double Sugars** (disaccharides)
These sugars require splitting by intestinal cell enzymes. There are four main disaccharides: lactose, sucrose, maltose, and isomaltose.

Lactose is found in fluid milk, dried milk powder, commercial yogurt, homemade yogurt which has not been fermented for 24 hours, processed cheeses, cottage cheese, cream cheese, ice cream, some sour creams, whey (70% lactose by weight), and many products which have added milk solids or whey. Many drugs and vitamin and mineral supplements have added lactose.

Sucrose is table sugar and is found in processed foods such as gelatin desserts, ketchup, cereals, many canned foods and some frozen preparations.

Maltose and Isomaltose are found in sources such as corn syrup, malted milk, and candies.

**Starch** (polysaccharides)
Starch can be of two types called amylose and amylopectin. Most vegetables contain both types in various proportions. Vegetables that contain more amylose than amylopectin starch are simpler to digest.

The small intestine is where we absorb our vitamins and minerals as well, and the most common vitamins and minerals that are not absorbed (or lacking) in patients with chronic intestinal disorders are:

Vitamins: **Vitamin B12** (which can even fall within the ‘normal’ range in testing but still not be high enough for optimal health) *Any woman with an intestinal disorder who is on the contraceptive pill must very seriously consider vitamin supplementation, especially of the B-Complex family, some of which are depleted by birth control medication.) **Vitamin C** Since Vitamin C is readily destroyed as a result of cooking and exposure to air, it is advisable that at least 100 mg be taken daily. **Vitamin D**…should be taken in combination with vitamin A.

Minerals: **Calcium, iron, iodine and potassium.**
Minerals, unlike vitamins, are not destroyed by air or temperature but can be lost in cooking water.
The Lectin Effect

Researchers are now finding that lectins are also involved in food allergies/sensitivities, inflammation and autoimmune disease, including celiac disease.

Lectins are hardy proteins that do not break down easily. They are a class of proteins known for their ability to bind to the carbohydrates found in our cells and are resistant to stomach acid and digestive enzymes.

Lectin intolerance means the inability to deactivate the toxic lectin (prevent its binding to your cells) in the confines of your own body, be it in the gut, artery, organ, gland or brain. The lectin then proceeds to invoke immune responses that damage the cell to which it attaches and possibly surrounding cells. This antigen/antibody response is also related to most autoimmune diseases and many degenerative diseases, which, may need to be reclassified as autoimmune.

Lectins may bind to the gut wall and damage the gut lining. They are not altered by digestive enzymes, and may alter or compound gut permeability as well as pass through the gut into general circulation. In so doing, they disable cells in the GI tract, keeping them from repairing and rebuilding. Therefore, lectins can contribute to eroding your intestinal barrier (leaky gut). Lectins can cause alterations in gut function that may be related to colitis, Crohn's Disease, Celiac-Sprue, IBS and gut permeability.

Lectin intolerance reactions occur in the gut, general circulation (artery walls and the like), brain, gland or organ as well as red blood cells. Having gained access to general circulation various lectins may bind to surface cell membranes in arteries and vessels, organs and glands, including the thyroid, pancreas, kidney and adrenals, in susceptible animals and humans.

This binding begins an antigen antibody reaction leading to autoimmune disorders and so-called degenerative diseases. Different lectins have been implicated in different diseases. Dairy lectins have been implicated in juvenile onset type I diabetes. Wheat lectins have been implicated in juvenile nephropathy (inflammatory kidney disease).

Whole grains, peanuts, kidney beans, and soybeans are high in lectins. Cow's milk, nightshade vegetables (like potatoes and tomatoes) and some seafood also contain fairly high amounts of lectin. In fact, estimates are that about 30% of our foods contain lectins, and about 5% of the lectins we eat will enter our circulation.

High levels of plant lectins can be toxic and cause a form of food poisoning. Symptoms of lectin food poisoning include nausea, vomiting and diarrhea. This toxicity may be caused by the ability of lectin to inhibit cell repair. Many commonly consumed foods contain lectin, but proper cooking of these foods may inactivate the lectin proteins.

The most common potentially 'toxic' lectin containing food groups are:

- grains, especially wheat and wheat germ but also quinoa, rice, buckwheat, oats, rye, barley, millet and corn.
- legumes (all dried beans, including soy and peanuts),
- dairy (perhaps more so when cows are feed grains instead of grass, a speculation based on research showing transference of lectins into breast milk and dairy.
- nightshade (includes potato, tomato, eggplant and pepper).
Beans that show oral toxicity include kidney beans, navy beans, pinto beans, lima beans and broad beans. Broad beans are also known as field beans or fava beans.

Vegetables with lectins that do react include tomatoes, potatoes, string beans, zucchini, green peas, asparagus, radish, sweet peppers, cucumber seeds and mushrooms. Other human-reactive lectins are in the sprouts of soybeans, mung bean and lentils. Some lectin levels vary considerably even among the same vegetable. One zucchini, for example, may contain more lectin than a zucchini from another location or one harvested at another time. These vegetables can be eaten raw, as their lectins are not orally toxic. However, if you are lectin-sensitive you will find these vegetables easier to digest when they are cooked.

Even though fresh fruits and vegetables are mainly monosaccharides and easily digestible by people with chronic intestinal issues, many of those same fruits and vegetables contain lectin. It’s the lectin in the food that creates a problem in the intestines, and in essence, the body.

Genetically modified foods are modified by splicing 'lectins' from one plant family to another. This is extremely problematic. If you know you react to a particular plant family but that lectin has been put in a plant not of that family you may consume the 'toxic to you' lectin, have the reaction/response and not know the cause.

Most persons are aware that there are certain foods they seem to 'react' to. Symptoms could be obvious, such as gas, bloating, diarrhea or constipation (or both, alternating). Less obvious symptoms may include headache, fatigue, 'indigestion', skin problems including hives, psoriasis, swollen joints or water retention.

Some symptoms may occur chronically and may seem in no way related to a gut/food or lectin intolerance reactions. This group of symptoms includes the so-called degenerative diseases and autoimmune diseases like atherosclerosis, hypertension, osteoporosis, senile dementia, osteoarthritis and rheumatoid arthritis, inflammatory joint diseases, fibromyalgia, chronic fatigue, and adult onset diabetes. Even obesity has been associated with consumption of 'enemy' lectins.
GLUTEN IN OUR FOOD

Remember…all wheat is gluten, but not all gluten is wheat. Other foods that do not contain wheat contain gluten. Read your labels and know your ingredients. Most soups and sauces are thickened with flour…it might not be on the label, or the waiter might not know that…so you have to ask. Most cheeses do not contain gluten, EXCEPT blue cheese (and some pre-shredded cheese). Some blue cheese does contain gluten because the process for making it ‘blue’ involves injecting bread mold into the cheese. Some manufacturers use the traditional method of using bread mold. Other manufacturers use a liquid blue mold that is made in a factory that does not contain gluten. So, make sure the one you are enjoying is made with the factory made liquid blue. These include: BelGioso gorgonzola, Marin French Cheese Factory blue cheese, Maytag blue cheese, Montforte blue cheese, Pt. Reyes blue cheese, Rosenborg blue cheese, Paladin MonSalvat blue cheese.

<table>
<thead>
<tr>
<th>Allowed Foods</th>
<th>Not Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice, corn, soy, potato, tapioca, beans, garfava, sorghum, quinoa, millet, buckwheat, arrowroot, amaranth, teff, Montina, nut flavors.</td>
<td>Wheat (durum, graham, kamut, semolina, spelt), rye, barley, triticale, or products containing these items.</td>
</tr>
<tr>
<td>Distilled vinegars, distilled alcoholic beverages, wine.</td>
<td>Malt or malt flavoring, malt vinegar, beers, ales, lagers (are made from gluten-containing grains)</td>
</tr>
<tr>
<td>Brand-name packaged yeast</td>
<td>Brewer’s yeast that is a byproduct of beer; brewer’s yeast nutritional supplements made from brewer’s yeast.</td>
</tr>
<tr>
<td>Caramel color made from corn, Citric Acid</td>
<td>Caramel color made from barley malt.</td>
</tr>
<tr>
<td>Dextrin made from corn, rice, potatoes, arrowroot, or tapioca.</td>
<td>Dextrin made from wheat.</td>
</tr>
<tr>
<td>Maltodextrin (despite the name) is gluten-free unless produced with wheat.</td>
<td>Wheat maltodextrin or maltodextrin (wheat)</td>
</tr>
<tr>
<td>Pure spices or bottled spices containing silicon dioxide. Vanilla and vanilla extract</td>
<td>Some companies use flour as an anti-caking devise. Make sure the spices are ‘pure’.</td>
</tr>
<tr>
<td>Cornstarch</td>
<td>Starch or modified food starch made from wheat.</td>
</tr>
<tr>
<td>Pure, uncontaminated oats used in moderation (1 cup cooked) are considered safe for most people but check with your physician before adding to your diet.</td>
<td>Caution: Bulk foods may come in contact with gluten during processing or storage.</td>
</tr>
</tbody>
</table>
Foods That May Contain Gluten:

- Bread or bread products, coating mixes
- Broth, soup bases
- Brown rice syrup
- Candy
- Cheese sauces, cheese spreads flavored cheeses
- Communion wafers
- Croutons, imitation bacon
- Dried fruits (may be dusted with flour)
- Drugs and over-the-counter medications
- Flour or cereal products
- Herbal supplements
- Hydrolyzed vegetable protein
- Ice creams made with gluten-containing ingredients (cookie dough, brownies, waffle cone pieces, etc)
- Icing and frosting (may contain wheat flour or wheat starch)
- Imitation seafood
- Marinades
- Matzo products
- Oats
- Panko
- Pastas
- Potato chips (some may contain wheat flour or wheat starch)
- Processed luncheon meats (Boar’s Head has a line of gluten free luncheon meat)
- Rice blends or mixes
- Sauces, gravies
- Seasoned nuts
- Self-basting poultry
- Soy sauce or soy sauce solids
- Stuffing, dressing
- Tempeh (may be combined with wheat)
- Thickeners (roux)
- Vegan products (may have wheat or flour added)
- Vitamin and mineral supplements
- Yogurts

If you are unsure if a product contains wheat or gluten simply call the company. If you are in a restaurant and are unsure if a menu item contains wheat, ask the waiter to consult the chef. Better safe than sorry.