

THE GLUTEN FREE DIET

WHAT'S ALL THE HYPE ABOUT?

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The gluten-free (GF) diet has become a hot topic over the last few years. With celebrities and professional athletes embracing it along with others who promote fad diets, it is hard to sift through fact vs. fiction. Much of the popularity is from the proposed link between a GF diet and weight loss. However, to date, no randomized controlled clinical trials have been conducted to support this claim. Another reason for the diet's popularity is due to an increased prevalence of celiac disease in the population over the past 50 years. Many reasons may be contributing to this including higher rates of diagnosis, excessive wheat consumption or the composition of bacteria in our gut being a trigger.

CELIAC DISEASE

Celiac Disease (CD) is the most common inherited autoimmune disorder, where the villi of the small intestine are damaged by gluten, resulting in poor absorption of essential nutrients. It is estimated that 1% of the population have CD, however many remain undiagnosed. Prevalence is often increased with associated conditions such as type-one diabetes, autoimmune thyroid disease, autoimmune liver disease or Down syndrome.

Symptoms

The severity of symptoms associated with untreated CD is highly individual. Symptoms are often silent and CD is only discovered through testing. The following symptoms can occur singly or in combination:

- Anemia-iron, folate, vitamin B12 deficiency
- Deficiency of vitamins A, D, E, K
- Abdominal pain, bloating/cramping/gas
- Indigestion and nausea
- Recurring/persistent diarrhea
- Constipation
- Extreme weakness and fatigue
- Weight loss
- Lactose Intolerance
- Dermatitis herpetiformis (skin form of CD)
- Recurrent canker sores
- Bone/joint pain
- Menstrual irregularities
- Infertility in men and women
- Migraine
- Changes in mood/depression/irritability
- Bruising of skin
- Low bone mineral density
- Dental enamel defects
- Peripheral neuropathy, ataxia, epilepsy

Similarity of symptoms to those of other diseases often leads to misdiagnoses such as irritable bowel syndrome, lactose intolerance, chronic fatigue syndrome, and diverticulosis.

Diagnosis

- Blood tests: Antibodies IgA endomysial (EMA) and IgA tissue transglutaminase (TTG) are tests available to screen for CD. False negative results can occur with these tests.
- Biopsy: For positive blood tests the next step is a biopsy which is the GOLD-STANDARD for diagnosing CD. It is important for a minimum of four to eight biopsy samples be taken.
- Genetic testing: Blood or swab tests are done to determine if an individual carries specific genes for CD (HLA, DQ2, DQ8). Testing can be done if a GF diet has already been started or for close relatives of people with confirmed CD.

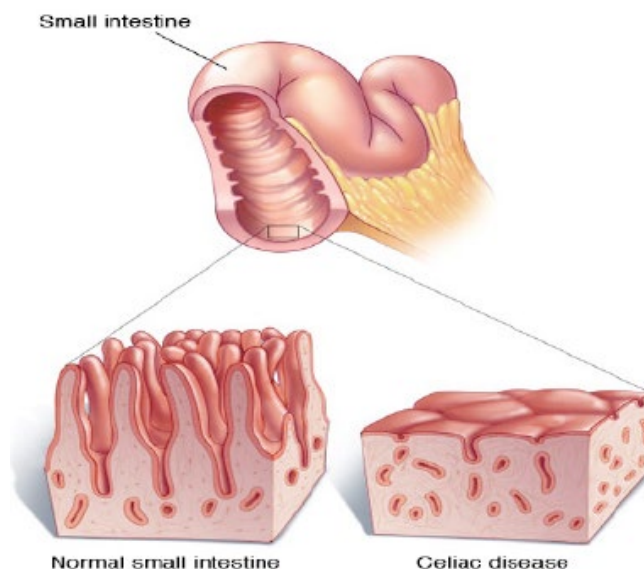
Note: For adults, a minimum of 10g gluten / day (four slices of bread) must be consumed for four to six weeks before testing. **It is vital to test for CD before going on a GF diet!** http://www.victoriaceliac.org/images/uploads/Why_Test_Before_GF.pdf

Treatment

A strict gluten-free (GF) diet for life is the **ONLY** treatment for CD. This will allow the gut to heal, eliminate symptoms and reduce the risk of developing complications linked with untreated CD. These include nutritional deficiencies, osteoporosis, reproductive complications (infertility and miscarriage), lymphoma and the development of other autoimmune disorders.

GLUTEN SENSITIVITY

According to recent research it is possible to be sensitive to gluten but not have CD, and it is estimated that 6% of the population have a gluten sensitivity (GS). This is not an autoimmune disease, and consumption of gluten does not appear to cause the increased intestinal permeability or severe intestinal damage as seen in CD. Also, celiac antibodies may or may not be present with testing. Symptoms are similar to CD including abdominal pain, bloating, gas, diarrhoea, unexplained anaemia, muscle cramps, leg numbness and bone or joint pain. Currently there are no tests to diagnose GS, and the only way to determine if you have GS is to rule out CD and a wheat allergy. It is unknown if an individual with GS needs to follow a GF diet as strictly, or for life as those with CD.



WHAT IS GLUTEN?

This is the general name for the storage protein (prolamins) in wheat, rye, barley and related grains (triticale, spelt and kamut). It is found in a variety of foods such as breads and other baked products, cereals, pasta, soups, sauces, seasonings, salad dressing, snack foods, prepared meats, even in some nutritional supplements and medications. Typically, foods allowed on a GF diet include plain meat, poultry, fish, eggs, legumes, nuts, seeds, milk, yogurt, cheese, fruits, vegetables, as well as many gluten-free flours, cereals and starches (see lists below).

Do I Need to Follow a GF Diet?

If you are experiencing any of the listed symptoms, have a close family member with diagnosed CD, or are concerned about your risk for CD or GS, speak to a physician or sport dietitian before self-diagnosing and/or going on a GF diet. Proper support and education are essential. A sport dietitian can help you make safe and nutritious GF choices, properly read labels, safely eat at restaurants and avoid any risks of cross contamination. Here is a list of grains to avoid while on a GF diet:

- | | | | |
|------------|-------------------|---------------------|----------------|
| • Barley | • Emmer* | • Malt Flavouring** | • Triticale |
| • Bulgur | • Farro* | • Commercial Oats | • Wheat |
| • Couscous | • Kamut | • Rye | • Wheat Bran |
| • Durum | • Malt** | • Semolina | • Wheat Starch |
| • Einkorn | • Malt Extract ** | • Spelt (Dinkel)* | • Wheat Germ |

* Ancient variety of wheat

** From barley

Frequently Overlooked Items that may Contain Gluten

- Corn and rice cereals (must say GF on label)
- Baked beans
- Dry roasted or flavoured nuts
- Seasoned rice mixes and rice pilafs
- Seasoned potato chips, corn chips, and other snack foods
- Breading, stuffing, gravy
- Chocolate bars, chocolate, licorice
- Flavoured and herbal teas, flavoured coffees, coffee substitutes
- Self-basting poultry, imitation seafood
- Amaranth
- Arrowroot
- Pure buckwheat
- Corn
- Flax
- Indian Ricegrass
- Legume flours (bean, chickpea, lentil, pea)
- Mesquite flour
- Millet
- Nut flour (almond, hazelnut, pecan)
- Potato flour and starch
- Beer, ale and lager (from barley, but GF options are available)
- Sauces, soy sauces, salad dressings, marinades
- Seasonings, specialty prepared mustards
- Sushi
- Soups, soup bases, broth, bouillon cubes
- Meat loaf, sausages, hot dogs, other processed meats, burgers (beef, fish, chicken), imitation bacon bits
- Meat substitutes (vegetarian burgers, textured vegetarian product)
- Quinoa
- Rice bran
- Rice polish
- Sago
- Sorghum
- Sweet potato flour
- Rice (all varieties)
- Tapioca
- Teff
- Pure, uncontaminated oats only *

*Bob's Red Mill – www.bobsredmill.com; Cream Hill Estates www.creamhillestates.com; Avena Foods www.onlyoats.com; Gifts of nature www.giftsofnature.net; Gluten-Free Oats www.glutenfreeoats.com; Gluten-Free Prairie www.glutenfreeprairie.com

GLUTEN-FREE FLOURS, CEREALS, AND STARCH

Nutritional Concerns

Prior to diagnosis, untreated CD can affect nutrient absorption and increase the risk of a variety of vitamin and mineral deficiencies. In order for your intestinal villi to heal and nutrients to be fully absorbed, a strict GF diet is required with focus on these specific areas:

- **Lactose:** It is estimated that 30-60% of individuals with CD temporarily develop secondary lactose intolerance until the gut fully heals from following a GF diet. Consider trying:
 - Lactase enzyme drops or tablets when consuming dairy foods
 - Lactose-reduced milk
 - Lactose-free soy, rice, nut and potato beverages
 - Yogurt and some cheeses, which may be better tolerated than other dairy products
 - And ensure your food choices are enriched with calcium, vitamin D and other nutrients and contain no gluten ingredients such as barley malt often used for flavouring
- **Make sure you are consuming adequate calcium and vitamin D:** Ensuring adequate calcium and vitamin D is essential because of the connection between early bone disease and CD. Discuss with your physician or sport dietitian if a gluten-free supplement is required.
- **Iron:** 66% of adults with biopsy-proven CD have iron deficiency anemia prior to diagnosis. This means that consumption of iron-rich, gluten-free foods is essential.

- **Limit highly processed GF products:** Many are higher in fat and sugar and lower in nutrients than their gluten-containing alternatives.
- **Look for enriched GF products:** Ensure the GF products are enriched with B-vitamins, iron and dietary fibre.
- **Fibre:** Emphasize fibre-rich GF foods to ensure consistent bowel habits. Choose fruits, vegetables, nuts, seeds, legumes and their flours, amaranth, flax seed, mesquite flour, pure and uncontaminated oats, quinoa, rice bran, rice (brown and wild) and teff.

Resources:

www.glutenfreediet.ca

www.glutenfreepassport.com

www.celiaccentral.org

www.theceliacscene.com

www.reallifewithceliacdisease.com

www.glutenfreefind.com

www.celiac.ca

www.csaceliacs.org

www.celiac.org

www.gluten.net

GET MORE NUTRITION FROM YOUR GLUTEN-FREE DIET

<i>If You Eat This:</i>	<i>Add This:</i>	<i>Or Try This:</i>
Breakfast		
Puffed rice or corn cereal	Fresh fruit	GF granola with nuts, seeds, ground flax, dried fruit. For a list of GF cold cereals and granolas go to: http://www.glutenfreediet.ca/img/allergliv-summer2011canada.pdf
GF white rice bread or bagel	Nut butter, cheese, poached egg, or omelette with chopped vegetables	GF enriched bread or bagel; or try the recipe on following page to make your own bread
GF waffles or pancakes with syrup (made with white rice flour)	Cottage cheese or yogurt and fruit	Substitute brown rice, buckwheat, bean flour or ground flax for some of the white rice flour; or try GF fibre-rich frozen waffles
Power Lunches and Dinners		
White rice bread sandwich, mayo and lunch meat	Sprouts, lettuce, tomatoes, avocado, shredded carrots and cheese	GF enriched bread or bagel; low-fat mayo, salsa or GF mustard; salmon, tuna, low-fat GF deli meats (chicken, turkey, pastrami or ham), homemade left over poultry/roast meat
White rice and meat, fish or chicken	Fresh or frozen vegetables	Brown rice, or a combo of brown, wild and white rice; quinoa or pure buckwheat
Baked or mashed potato	Cheese and chopped veggies such as broccoli or asparagus on baked potato and milk and grated low-fat cheese in the mashed potatoes	Try a sweet potato or any mashed root vegetable or mashed cauliflower
Iceberg lettuce salad, GF croutons, cucumbers and celery with salad dressing	Tomatoes, peppers, cauliflower, broccoli, mushrooms, shredded carrots, spinach, kale, chickpeas, sunflower seeds	Romaine or spinach with strawberries or mandarin oranges, toasted slivered almonds, and/or sesame seeds with a fruit-based dressing or oil and vinegar dressing
Snack Ideas		
GF pretzels	Unseasoned nuts and seeds	Trail mix with GF granola, dried fruits, nuts and seeds
Rice crackers	Cheese (cubes or string), hummus, avocado with diced tomatoes	Brown rice cakes with nut butter and apple slices
Fried corn chips	Salsa and shredded cheese	Baked corn chips with low-fat cheese and sour cream; popcorn

BROWN BREAD - Makes One Loaf or 12 Servings



Ingredients

- 1 ¼ cups brown rice flour
- ½ cup sorghum flour
- ½ cup corn-starch
- ½ cup rice bran
- 1 tbsp xanthan gum
- 1 tbsp bread machine or instant yeast
- 1 ¼ tsp salt
- 1 cup water
- 1 tsp cider vinegar
- 2 tbsp vegetable oil
- 1 tbsp liquid honey

Directions

1. Lightly grease a 9 x 5 inch (2L) loaf pan
2. In a large bowl or plastic bag, combine the first seven ingredients. Mix well and set aside
3. In a separate bowl, using a heavy-duty electric mixer with paddle attachment, combine the last six ingredients until well blended
4. With the mixer on lowest speed, slowly add the dry ingredients to the honey mixture until combined. With a rubber spatula, scrape the bottom and sides of the bowl. With the mixer on medium speed, beat for four minutes.
5. Spoon into prepared pan. Let rise, uncovered, in a warm, draft-free place for 60 - 75 minutes or until the dough has risen to the top of the pan. Meanwhile, pre-heat the oven to 350°F. Bake for 30 - 45 minutes or until the loaf sounds hollow when tapped on the bottom.

Reference: Washburn, D & Butt, H. (2013). Easy Everyday Gluten-Free Cooking

REFERENCES

1. American Gastroenterological Institute. AGA Institute Medical Position Statement on the Diagnosis and Management of Celiac Disease. Gastroenterology 2006;131:1977-1980.
2. Canadian Celiac Association, Dietitians of Canada. Gluten-Free Eating. (April 2011). Retrieved from: http://www.glutenfreediet.ca/media/Gluten_Free_Eating_Apr_2011.pdf
3. Canadian Celiac Association. (March 2008). Nutrition Complications for Celiac Disease http://www.celiacguide.org/articles/Nutrition_Complications_CCA.pdf
4. Case, S. Celiac Disease, Gluten Sensitivity and the Gluten-Free Diet. (May 2013). Retrieved from: <http://www.todaysdietitian.com/pdf/webinars/PresentationSummaryHandout.pdf>
5. Case, S. (May 28, 2013). Gluten Free "Diets" & Celiac Disease [Webinar]. Retrieved from: <http://ce.todaysdietitian.com/node/13814/takecourse/491#top>
6. Canadian Celiac Association. (August 2006). Celiac Disease – Hidden & Dangerous. <http://www.glutenfreediet.ca/img/MedicalFacts.pdf>
7. Fenster, C., & Case, S. Whole Grains and the Gluten Free Diet. Retrieved from:
8. <http://www.glutenfreediet.ca/img/WholeGrainHandoutFinal2012.pdf>
9. Go Gluten Free! Tips for Getting More Nutrition into the Gluten Free Diet. Retrieved from: http://www.glutenfreediet.ca/img/Meal_chart.pdf
10. Healthy Grains Institute. Hot Topic: The Gluten-Free Diet. <http://www.healthygrains.ca/resources/fact-sheets/gluten-free-hot-topic-fact-sheet/>
11. Health Canada, Food and Nutrition, Celiac Disease. <http://www.hc-sc.gc.ca/fn-an/securit/allerg/cel-coe/index-eng.php>
12. Biesiekierski J., et al. Gluten causes gastrointestinal symptoms in subjects without celiac disease: A double-blind randomized placebo-controlled trial. Am J Gastroenterol 2011;106:508-14.