

# Answers!<sup>™</sup>

## To Gluten Intolerance

*Presented By:*  
*Dr. Shan Hager*

## Problem 1 - Storage



- most of these pesticides are fumigants (gas producing) and are “restricted use pesticides” that are *highly toxic, can be dangerous*, and can only be purchased and used by certified and licensed applicators
- Storage at temperatures above 60o F* causes a more rapid decline in seed viability (ability to germinate) and a rapid incline in rancidity
- A high moisture content* (greater than 12%) in grain causes damage because it promotes diseases. The outer layer of each kernel of grain may bear several thousand spores of fungi and bacteria which are inactive at low moisture levels.

[extension.usu.edu](http://extension.usu.edu)

 **Utah State University**  
COOPERATIVE EXTENSION



Modern wheat has had a very long history of hybridization, starting with ancestral grasses in the wild and also occurring naturally in farmers' fields in antiquity. Humans have *continued the process chemically in the last century, and especially during the last 50 years in order to increase yields*, resist fungal diseases and pest attacks, improve ease of mechanical harvesting and meet rigorous demands of industrial milling and mechanized baking methods. Transgenic wheat varieties via GMO technology are now waiting in the wings for their debut, albeit to an unexpectedly (at least to Monsanto) hostile audience both at home and abroad.



But even before these latest GMO changes, it appears that recent forced and accelerated hybridizations have changed wheat nutritionally in ways that no one seems to have considered, *while research into the health effects of these transformations has barely begun*. It is through the story of modern wheat's pedigree, some of which is still disputed by archaeobotanists, that some light can be shed upon gluten intolerance and celiac disease.

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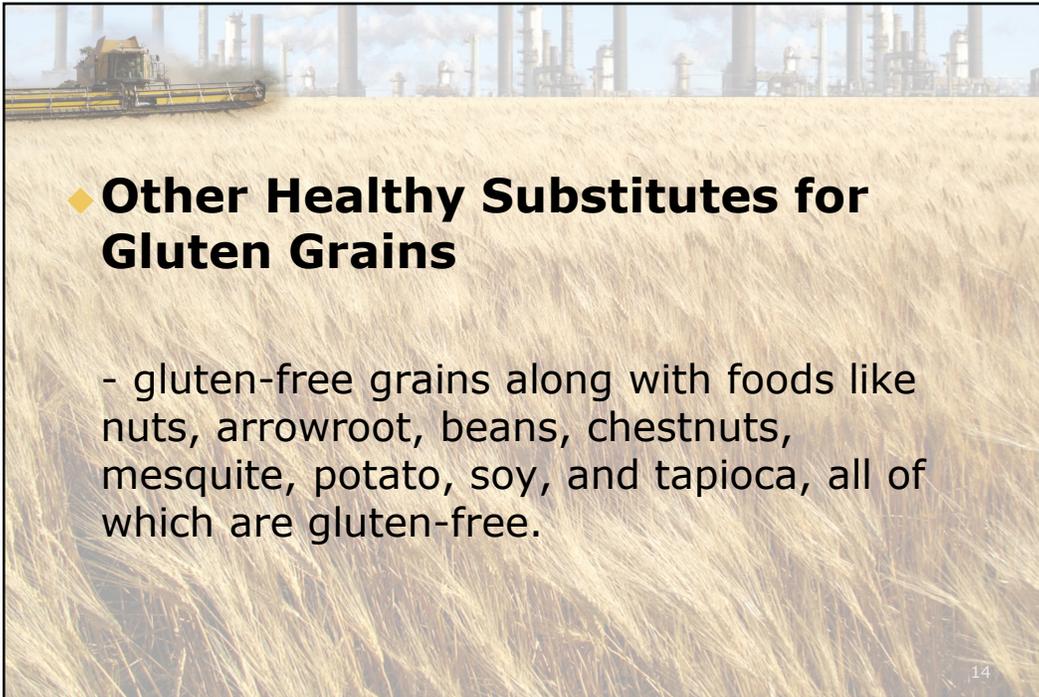
◆ **Grains with GLUTEN**

- Wheat varieties: spelt, emmer, farro, einkorn, kamut, durum, semolina, bulgur, cracked wheat, wheatberries
- Barley
- Rye
- Triticale
- \*\*\*Oats\*\*\*

◆ **Without GLUTEN**

- Amaranth
- Buckwheat
- Corn
- Millet
- Montina (Indian Rice Grass)
- Quinoa
- Rice
- Sorghum (also called milo)
- Teff
- Wild Rice

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◆ **Other Healthy Substitutes for Gluten Grains**

- gluten-free grains along with foods like nuts, arrowroot, beans, chestnuts, mesquite, potato, soy, and tapioca, all of which are gluten-free.

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GLUTEN FREE Resources

- ◆ <http://www.celiac.org/>
- ◆ <http://www.csaceliacs.org/oatintolerance.php>
- ◆ <http://www.wholegrainscouncil.org/whole-grains-101/gluten-free-whole-grains>
- ◆ <http://www.savorypalate.com/>
- ◆ <http://glutenfreeliving.com/ingredient.php>
- ◆ <http://www.gluten.net/diet.php>
- ◆ **Dangerous Grains: Why Gluten Cereal Grains May ...**  
by James Braly, Ron Hoggan - 2002 - 272 pages
- ◆ <http://www.organicconsumers.org/whole-grains/>

Places to Purchase GLUTEN FREE

- ◆ <http://www.allergygrocer.com/>
- ◆ <http://www.bobsredmill.com/>
- ◆ <http://www.ener-g.com/>
- ◆ <http://www.enjoylifefoods.com/>
- ◆ <http://www.glutenfreemall.com/>
- ◆ <http://www.glutenfree.com/home.aspx>
- ◆ <http://www.glutensolutions.com/>

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## What Does the Label Say?

- ◆ Reading labels is very important. In the U.S., the Food Allergen Labeling and Consumer Protection Act mandates that labels on foods manufactured after January, 2006, will list the word "**wheat**" to indicate the presence of wheat.
- ◆ But **the label doesn't have to list other gluten-containing grains** such as barley, rye, spelt, kamut, or triticale. The definition and requirements for gluten-free labeling are scheduled to be decided by the U.S. Food and Drug Administration by 2008. (NOT YET???)
- ◆ According to the American Celiac Disease Alliance, the *Food Allergen Labeling and Consumer Protection Act* (passed on August 2, 2004) requires the **top eight allergens** – milk, eggs, tree nuts, peanuts, fish, crustacean shellfish, soy and wheat – to be listed on food products.\*

## Hidden Sources of GLUTEN:

- ◆ Flavored prepackaged rice or pasta
- ◆ Tomato and spaghetti sauces
- ◆ Condensed canned soups
- ◆ Vegetable cooking sprays
- ◆ Flavored instant coffees and teas
- ◆ Some veined cheeses such as Roquefort and blue
- ◆ Chow mien noodles
- ◆ Artificial coffee creamer (all kinds)
- ◆ Bouillon cubes or powder, gravy and sauce mixes
- ◆ Imitation seafood products
- ◆ Ground spices
- ◆ Chewing gum can be dusted with wheat starch
- ◆ Communion wafers



## Indicate the presence of GLUTEN:

- ◆ Hydrolyzed plant protein (HPP)
- ◆ Hydrolyzed vegetable protein (HVP)
- ◆ Modified food starch (source is either corn or wheat)
- ◆ Mustard powder (some contain gluten)
- ◆ Monosodium Glutamate (MSG)
- ◆ Gelatinized starch
- ◆ Natural flavoring, fillers
- ◆ Whey protein concentrate
- ◆ Whey sodium caseinate
- ◆ White vinegar or white grain vinegar
- ◆ Rice malt (contains barley or Koji)
- ◆ Rice syrup (contains barley enzymes)
- ◆ Dextrin, malt, maltodextrin

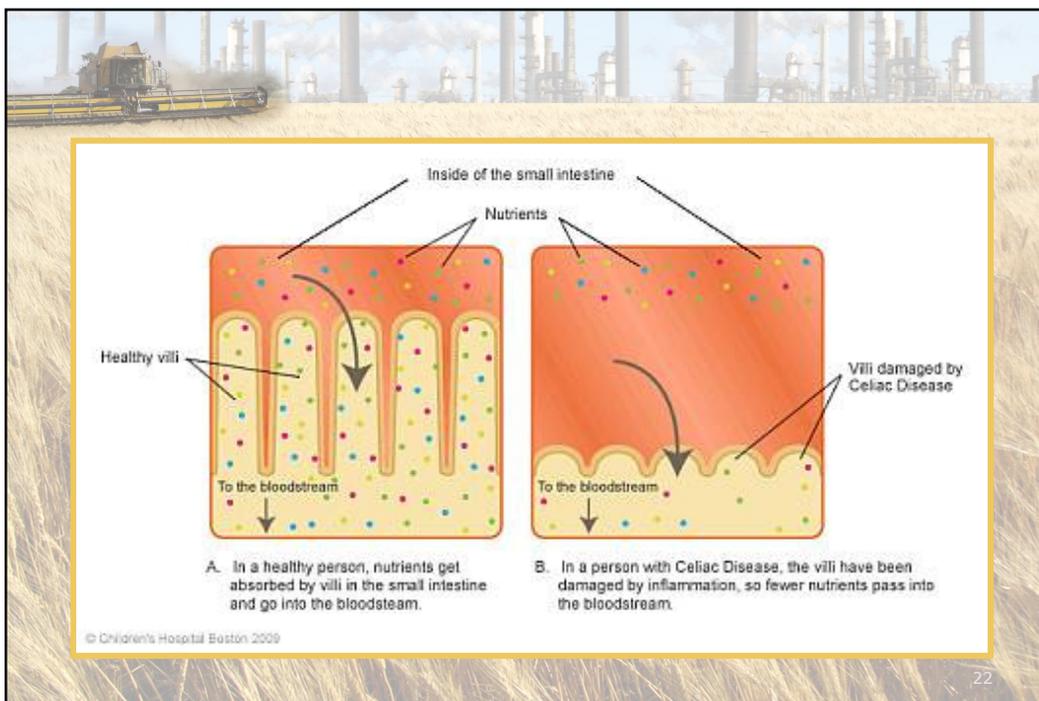


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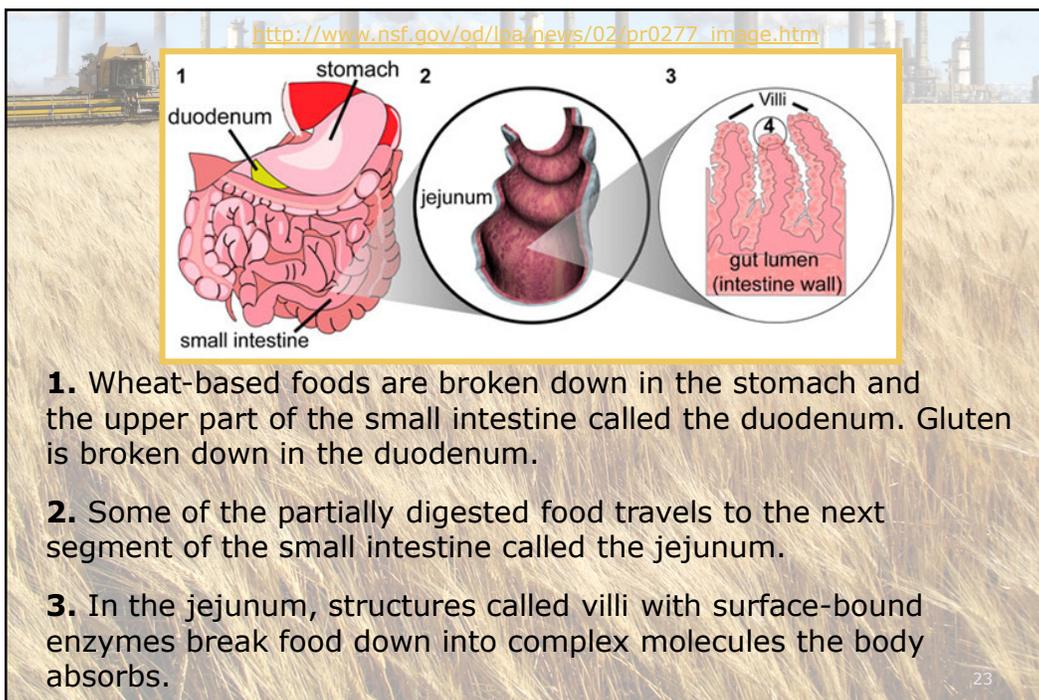
## Other Sources of GLUTEN:

- ◆ Lip stick and lip balm
- ◆ Sunscreen
- ◆ Glue on stamps and envelopes
- ◆ Laundry detergents
- ◆ Soaps and shampoos
- ◆ Toothpaste and mouthwash
- ◆ Cosmetics, lotions, creams
- ◆ Prescription drugs
- ◆ Health supplements (vitamin pills, etc.)





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[http://www.nsf.gov/od/lpa/news/02/pr0277\\_image.htm](http://www.nsf.gov/od/lpa/news/02/pr0277_image.htm)

**4.** Gluten adheres to the tips of villi where enzymes **break it down into simpler** molecules called peptides. Some of the peptides, called 33-MER, cannot be broken down any further.  
*This is true for all persons whether they suffer from celiac or not.*

**5.** Absorption **cells in the gut lumen absorb** 33-MER peptides and pass them into the tissues of the lamina propria. Antigen presenting cells (APC), part of the body's immune system, target foreign substances in the body for response by the immune system. APC do this by binding with the foreign substance, and then send biochemical signals to white blood cells to attack. In nearly all people with celiac sprue, APC bind with 33-MER only if the APC carry a protein called DQ2.

**6.** Once the intestinal wall absorbs 33-MER peptides, APC in celiac sprue patients **signal white blood cells to attack**. The result is eventual destruction of absorption cells and villi in the intestinal wall.

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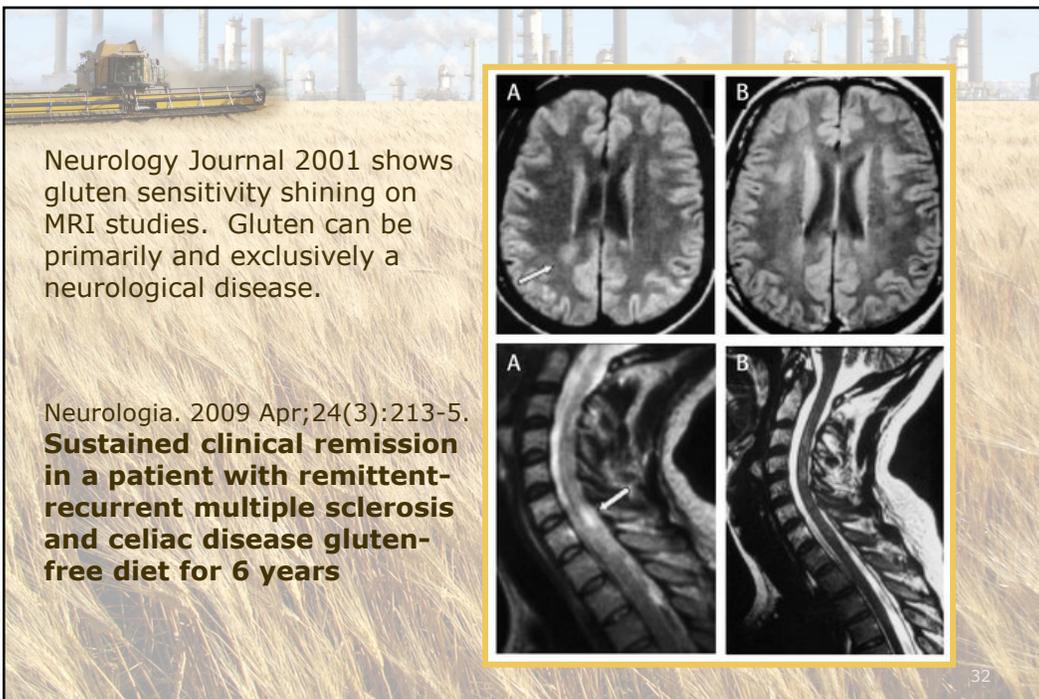
**"links between Celiac disease and other inflammatory diseases (e.g., asthma, inflammatory bowel disease)."**

Journal of Pediatric Gastroenterology and Nutrition:  
April 2005 - Volume 40 - Issue - pp S41-S42  
First International Symposium on Pediatric Inflammatory Bowel Disease: Session IV. The Changing Environment in IBD Manifestation and Pathogenesis  
**Celiac Disease as a Model of Gastrointestinal Inflammation**

**"disease-specific autoantibodies are also present in rheumatoid arthritis."**

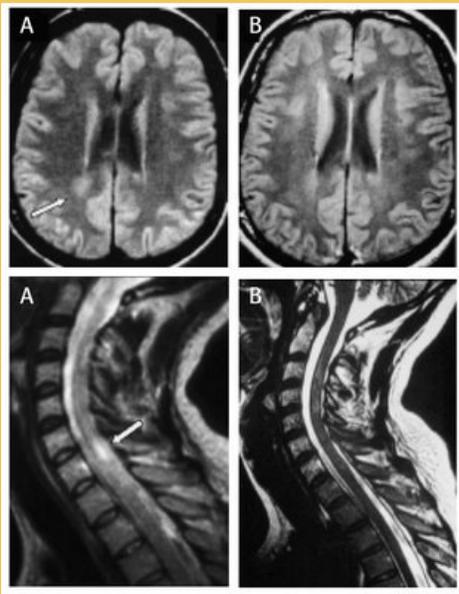
Trends in Immunology, Volume 27, Issue 4, 188-194, 1 April 2006  
**A gut feeling for joint inflammation using celiac disease to understand rheumatoid arthritis**

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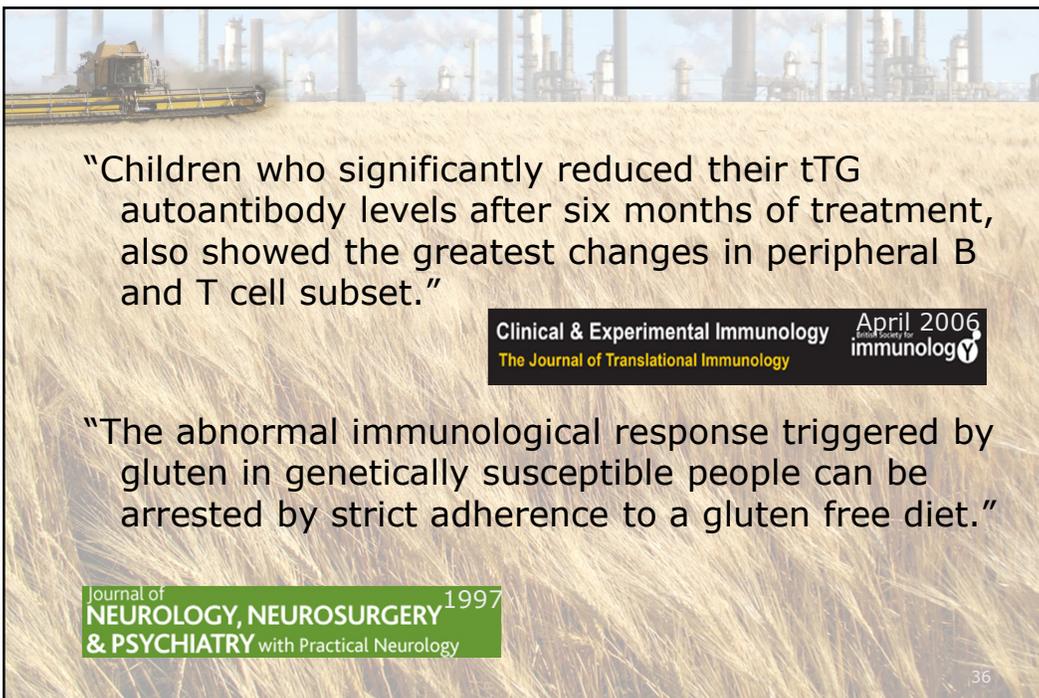


Neurology Journal 2001 shows gluten sensitivity shining on MRI studies. Gluten can be primarily and exclusively a neurological disease.

Neurologia. 2009 Apr;24(3):213-5.  
**Sustained clinical remission in a patient with remittent-recurrent multiple sclerosis and celiac disease gluten-free diet for 6 years**



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“Children who significantly reduced their tTG autoantibody levels after six months of treatment, also showed the greatest changes in peripheral B and T cell subset.”

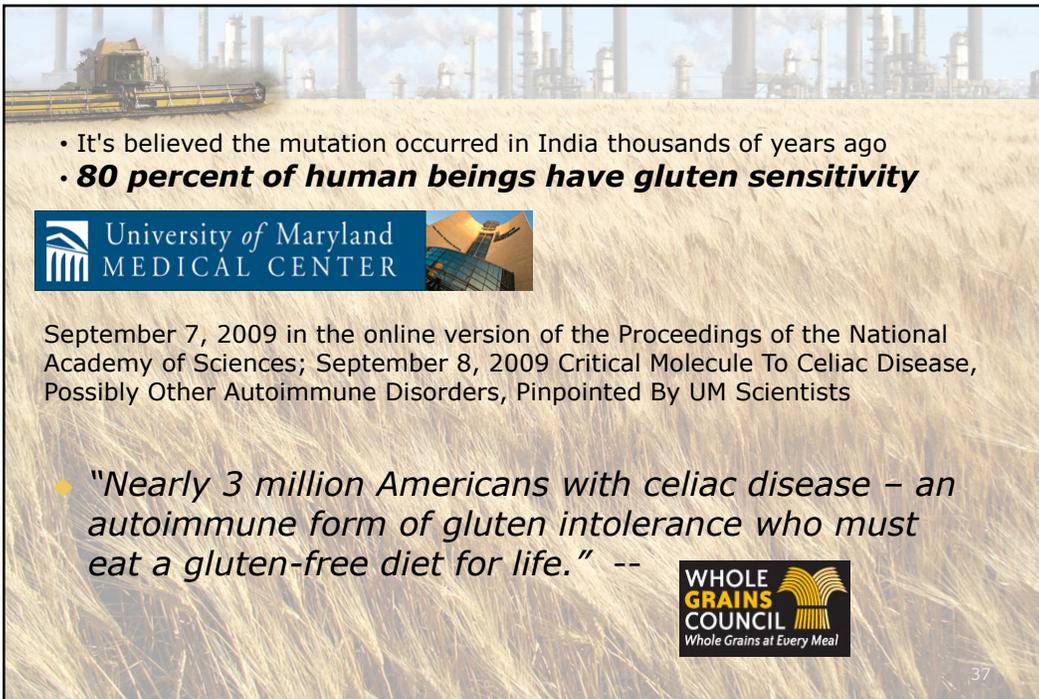
Clinical & Experimental Immunology  
 The Journal of Translational Immunology

April 2006  
 British Society for Immunology

“The abnormal immunological response triggered by gluten in genetically susceptible people can be arrested by strict adherence to a gluten free diet.”

Journal of  
**NEUROLOGY, NEUROSURGERY** 1997  
 & **PSYCHIATRY** with Practical Neurology

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- It's believed the mutation occurred in India thousands of years ago
- **80 percent of human beings have gluten sensitivity**

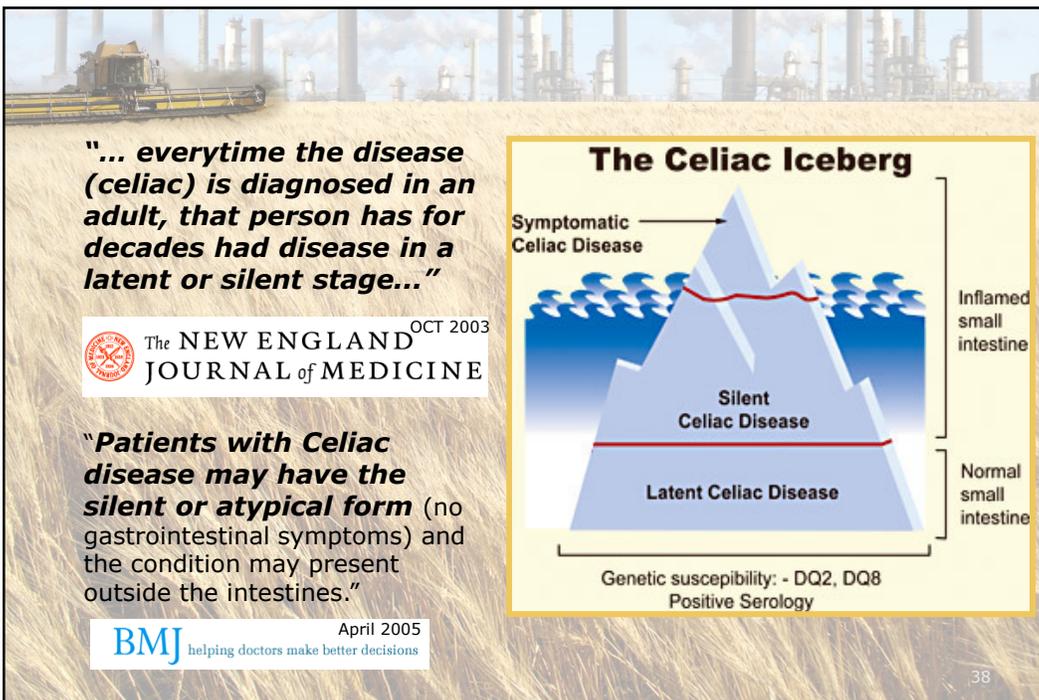

 University of Maryland  
 MEDICAL CENTER

September 7, 2009 in the online version of the Proceedings of the National Academy of Sciences; September 8, 2009 Critical Molecule To Celiac Disease, Possibly Other Autoimmune Disorders, Pinpointed By UM Scientists

- *"Nearly 3 million Americans with celiac disease – an autoimmune form of gluten intolerance who must eat a gluten-free diet for life." --*


 WHOLE  
 GRAINS  
 COUNCIL  
 Whole Grains at Every Meal

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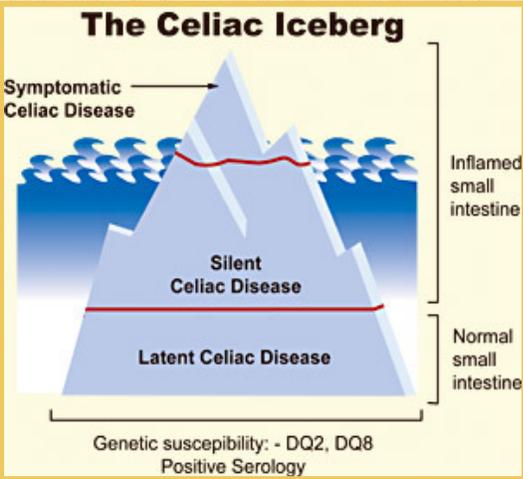
*"... everytime the disease (celiac) is diagnosed in an adult, that person has for decades had disease in a latent or silent stage..."*


 The NEW ENGLAND <sup>OCT 2003</sup>  
 JOURNAL of MEDICINE

*"Patients with Celiac disease may have the silent or atypical form (no gastrointestinal symptoms) and the condition may present outside the intestines."*


 BMJ <sup>April 2005</sup>  
 helping doctors make better decisions

### The Celiac Iceberg



Symptomatic Celiac Disease  
 Inflamed small intestine  
 Silent Celiac Disease  
 Normal small intestine  
 Latent Celiac Disease  
 Genetic susceptibility: - DQ2, DQ8  
 Positive Serology

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- ◆ Headaches (1)
- ◆ Ataxia – poor balance (3)
- ◆ Chronic fatigue syndrome
- ◆ Anemia (Iron-deficiency)
- ◆ Osteoporosis
- ◆ Weight loss / gain
- ◆ Short stature in children
- ◆ ADD / ADHD
- ◆ Mouth ulcers



The collage consists of three rectangular images with yellow borders. The top image shows a woman with blonde hair lying in a white bed, appearing to be asleep or resting. The middle image shows a woman with dark hair being examined by a blonde doctor who is using a stethoscope. The bottom image shows a woman with dark hair looking thoughtful, with her hand near her chin, in front of a computer monitor.

- ◆ Diarrhea / Constipation
- ◆ Abdominal bloating
- ◆ Crohn's disease
- ◆ Diverticulitis
- ◆ Depression (2)
- ◆ Autism
- ◆ Skin problems
- ◆ Asthma
- ◆ Irritability



The collage consists of four rectangular images with yellow borders. The top image shows a woman in a teal top holding her abdomen with both hands, indicating abdominal pain or bloating. The middle image shows a close-up of a hand with red, irritated skin, possibly a rash or eczema. The bottom-left image shows a close-up of a baby's face. The bottom-right image shows a woman with blonde hair holding her head in her hands, suggesting stress or depression.