

# CELIAC DISEASE AND THE GLUTEN-FREE DIET

Lara A. Field, MS, RD, LDN

Pediatric Dietitian

University of Chicago Celiac Disease Center

September 24, 2009

# Gluten-Free Diet

- Avoid all food products containing wheat, rye, barley, and oats and their derivatives
- Gluten = general name for storage protein (prolamins) found in these grains
- Complete exclusion of these foods is essential

# Nutrient Deficiencies

- Nutrient deficiencies may be present at time of diagnosis
  - Iron
  - Folate
  - Calcium
  - Fat-soluble vitamins
- Commonly found in the duodenum
  - First portion of the small intestine
  - Site of iron, calcium, magnesium, and zinc absorption
  - Nutrients that may become deficient over time
- As the damaged bowel is healed, vitamin absorption, becomes corrected

# Gluten Containing Grains: Foods to AVOID

- Barley
- Barley malt, extract
- Bran
- Bulgur
- Couscous
- Durum
- Einkorn
- Emmer
- Farina
- Faro
- Graham flour
- Kamut
- Matzo flour, meal
- Orzo
- Panko
- Rye
- Seitan
- Semolina
- Spelt
- Triticale
- Udon
- Wheat
- Wheat berry
- Wheat bran
- Wheat germ
- Wheat germ oil
- Wheat gluten
- Wheat starch

# Gluten-Free Grains:

## Foods SAFE to Consume

- Amaranth
- Arrowroot flour
- Baking soda
- Bean flour
- Buckwheat
- Cassava (Manioc flour)
- Corn flour, cornmeal, cornstarch
- Cream of tartar
- Dal or Dahl
- Flax
- Gelatin
- Green pea flour
- Gums: acacia, carob bean gum, carrageenan, cellulose, guala, guar, karaya, locust bean, tragacanth, xanthum
- Invert sugar
- Kudzu lecithin
- Legumes: channa, chick peas, gram, lentils, peanuts, peas, soy
- Maltodextrin
- Maltol (sweetener not related to malt)
- Mannitol
- Millet
- Montina™
- Molasses
- Mustard flour (ground mustard)
- Poi
- Potato flour
- Potato starch
- Quinoa
- Rice bran, rice flour, rice polishings, rice starch
- Sorghum
- Soy flour, soy starch
- Sweet potato
- Tapioca flour, tapioca starch
- Teff
- Tofu
- White vinegar
- Xanthum gum
- Yam
- Yeast

# Additives SAFE to Consume

- Caramel color - manufactured by heating carbohydrates and is produced from sweeteners
  - Gluten-containing ingredients can be used, not used in North America; corn is most often used, however it is important to check with food manufacturers.
  
- Maltodextrin is made from cornstarch, potato starch, or rice starch.
  
- Distilled white vinegar is safe to consume on the gluten-free diet.
  - Vinegar is made of acetic acid and flavoring materials such as apples, grapes, grain, and molasses.
  - Distilled vinegars filter out the large gluten proteins
  - Exception to this rule is MALT VINEGAR = not distilled = not safe to consume.

# What about Oats?

- Recent research in Europe and the US
  - Oats are well-tolerated by most children and adults when consumed in moderation and do not contribute to abdominal symptoms, nor prevent intestinal healing.
- PLEASE NOTE: regular, commercially available oats are frequently contaminated with wheat or barley.
- “Pure, uncontaminated” oats have recently become available from several companies in the US and Canada
  - These companies’ process oats in dedicated facilities and their oats are tested for purity. **Pure, uncontaminated oats** can be consumed safely in quantities < 1 cup per day.
- It is important that you talk to your physician and your registered dietitian prior to starting oats.

# Label Reading

- FALCPA (Food Allergy and Labeling Consumer Protection Act)<sup>10</sup>
  - ▣ Clear Labeling of top 8 allergens
    - Milk, eggs, soy, peanuts, tree nuts, fish, shellfish and WHEAT (excludes barley and rye)
    - The word “Contains” followed by the name of the major food allergen (milk, wheat, or eggs)
    - A parenthetical statement in the list of ingredients: albumin (egg)

# What does “Gluten-Free” mean?

- Term is unregulated in US at this time
  - Canada has determined a regulation for the term
  - Products are randomly tested for gluten content
  - European countries have a different definition – wheat starch is allowed

# What does “Gluten-Free” mean?

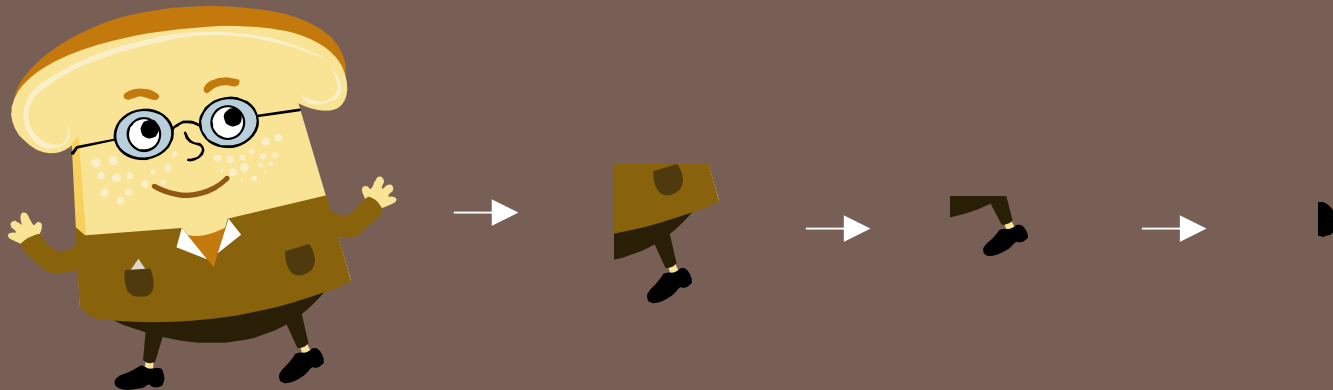
- Approval of this rule means that the food does not contain any of the following:
  - An ingredient that is any species of the grains wheat, rye, barley, or a crossbred hybrid of these grains (also referred to as “prohibited grains”)
  - An ingredient that is derived from a prohibited grain and that has not been processed to remove gluten (e.g., wheat flour)
  - An ingredient that is derived from a prohibited grain and that has been processed to remove gluten (e.g., wheat starch), if the use of that ingredient results in the presence of 20 parts per million (ppm) or more gluten in the food
  - 20 ppm or more gluten in the food

# How much gluten exposure is safe?

- Complete gluten avoidance is extremely difficult
  - Exposure to trace amounts of gluten common even if product is sold as *NATURALLY* gluten-free
  - Safe threshold for gluten exposure = 10-100 mg
    - Daily intake of 30 mg of gliadin seems not to harm the intestinal mucosa
  - Amount of residual gluten in gluten-free products and the total intake of these products must be considered

# How much gluten exposure is safe (<100 mg gliadin)?

- On average, one typical slice of wheat bread is approximately 40 grams (weight)
  - Protein makes up about 10-15% of the bread → 4 grams of protein.
  - Gliadin is 1/2 of the protein portion in wheat containing foods → 2 grams (2000 mg).
  - If a toxic reaction is caused by greater than or equal to 100 mg of gliadin, it takes only 5% of the protein portion of bread to cause an intestinal reaction.



# Cross Contamination

- Toaster
- Colander (strainer)
- Be careful with sponges!
- Condiment Containers (jam, butter, peanut butter, etc.)
  - ▣ Avoid double dipping!

# School Management

- Monitor activities with food (play dough)
  - ▣ Avoid using play dough, finger paints, pasta or any other gluten containing food products for art projects in school
  - ▣ Child should not feel ostracized from the rest of the class
- Thorough hand washing to ensure safety
  - ▣ Cross-contamination from foods or other gluten containing products that other children are using
  - ▣ Hand washing policy should be in place to ensure that celiacs remains safe after other children use these gluten containing products
- Parents should leave gluten-free snacks

# Gluten Free Snack Ideas

- ❑ Gluten-free Yogurt
- ❑ Gluten-free pretzels with peanut butter or cheese
- ❑ Fresh, dried, or canned fruit
- ❑ Popcorn
- ❑ Fresh vegetables and gluten-free dip
- ❑ Gluten-free snack bars
- ❑ Homemade gluten-free trail mix (gluten-free cereal, raisins, nuts, and M&M chocolate candies)

# Need more information?

- University of Chicago Celiac Disease Center  
5839 S. Maryland Avenue  
MC 4069, Room C-491  
Chicago, Illinois 60637  
Phone: 773-702-7593  
Fax: 773-702-0666
- [www.celiacdisease.net](http://www.celiacdisease.net)

# Contact Information

Lara Field, MS, RD, LDN

Pediatric Dietitian

847-651-4729

[lara@feedkids.com](mailto:lara@feedkids.com)