Learning Objectives
After completing, the learner will:
- Distinguish between celiac disease, non-celiac gluten sensitivity and wheat allergy
- Identify the dietary needs for celiac disease, non-celiac gluten/wheat sensitivity and wheat allergy
- Recognize the variety of resources that support gluten-free living

Prevalence
- ~15 million with diagnosed food allergies
- 5% of children
- 4% of adults
- Food Intolerance / Sensitivity
  - Not quantifiable
  - 1:3 people claim issues
  - P.S. That’s 100 million people
  - <1% of popu. w/diagnosed celiac disease

Defining an Allergy
- Abnormal response to a ‘normal’ food
- Triggered by immune system
- Body produces antibody IgE
- Reaction may be immediate or hours after exposure
- Response ranges from mild to severe
- Risk is tied to genetics
- Proteins in the offending food have survived usual breakdown from cooking, stomach acids and/or digestive enzymes

The Allergic Response
- Response & timing unique to individual
- Protein fragments are introduced and allergic reactions follow:
  - Itching in mouth; throat discomfort
  - Abdominal discomfort with digestion
  - Vomiting, diarrhea, GI pain
  - Allergens in bloodstream
  - Drop in blood pressure
  - Upon reaching the skin → hives, eczema
  - Reaching the lungs → wheezing

8 Foods cause 90%* of Allergies
- Milk
- Eggs
- Wheat
- Soybeans
- Peanuts
- Tree Nuts
- Shellfish
- Fish

*The other 10% is any number of other foods.
Definition – Intolerance / Sensitivity

- Intolerance / Hypersensitivity - not a true allergy
  - Non-IgE mediated
  - Not linked to genetics
- Abnormal physiological or psychological response to food or food compound
- Varied mechanisms of action:
  - Metabolic: absence of chemicals/enzymes to digest a food (e.g., lactose)
  - GI: Inability to absorb nutrients (e.g., fructose)
  - Pharmacologic: natural/artificial food chemical sensitivity (e.g., salicylates, nitrates, caffeine)
  - Psychological: extreme dislike for a food

Intolerance/Sensitivity Response

- Chronic vs. acute; less obvious
- Dose / exposure dependent
- Symptoms vary greatly
- Skin: rash, hives, dermatitis, eczema
- Respiratory: nasal congestion, sinusitis, throat irritation, asthma, cough
- GI: mouth ulcers, cramping, nausea, gas, diarrhea, IBS
- Anaphylaxis (rare)

Tip to Remember

- Allergies involve the immune system
  - Can be acute and life-threatening
  - However, no long-term consequences
- Intolerances / Sensitivities involve the GI tract
  - Rarely life-threatening
  - Long-term consequences possible; not likely

Gluten Intolerance?
Gluten or Wheat Sensitivity?
Wheat Allergy?
Sorting Out The Situation

Just What is Gluten?

- A Protein
- Found in cereal grains
- Gluten is composed of two protein factions:
  - Gliadin (a prolamin)
    - Wheat = gliadin
    - Barley = hordein
    - Rye = secalin
  - Glutenin (a glutelin)
  - Secaline = Wheat + Rye

Linking Gluten to Celiac Disease

- Celiac is a genetic disorder
  - 1:133
- Eating gluten triggers an autoimmune reaction
  - Body triggers an attack on the intestinal villi
  - Leads to malabsorption
- Left untreated = malnutrition
Celiac sounds like an Allergy

- Allergies (especially wheat) can be outgrown
- An allergy doesn’t create malabsorption → celiac does

Celiac: Symptoms & Diagnosis

- 200+ symptoms
  - Diarrhea, malnutrition, weight loss
  - Isolated nutrient deficiencies but no GI issues (e.g. bone disease)
- Suspicion → Blood test
- Genetic testing – fairly new
- Biopsy; with positive blood test
- Only Treatment = gluten-free diet

Associations

- Allergies
- Asthma
- Arthritis
- ADD
- Autism
- Cancer (GI)
- T1 Diabetes
- Epilepsy
- Fibromyalgia
- Kidney disease
- Migraines
- Nerve disease
- Osteoporosis
- Thyroid disorders

Common Sources of Gluten

- Barley malt/extract
- Bran
- Bulgur
- Couscous
- Durum
- Einkorn
- Emmer
- Farina
- Faro
- Graham Flour
- Hydrolyzed Veg Protein
- Kamut
- Matzo Flour/Meal
- Orzo
- Panko
- Seitan
- Semolina
- Speelt/Speelta
- Triticale
- Udon
- Wheat Germ
- Wheat Starch
Hidden Sources of Gluten
- Processed foods
  - Soups, bouillon, mixes
  - Communion wafers
  - Lipstick, toothpaste, chewing gum, mints
  - Licorice and some candies
  - Soy sauce, marinades
  - Modified food starch
  - Supplements
  - Medications

How much gluten is tolerated?
- NONE
- Small amounts of gluten can damage the intestine
  - Small = 1/7000th of a slice of wheat bread equates to the ‘less than 20 ppm gluten’

Non-Celiac Gluten Sensitivity**
- Greater occurrence than celiac
- Often self-diagnosed
- Diagnosed NCGS/NCWS if removing gluten from diet helps
- Negative test for celiac
- No intestinal villi destruction (?)
- BUT symptoms linked to gluten
  - c/o diarrhea, bloating, fatigue, “foggy brain”

Non-Celiac Gluten Sensitivity**
- ?? No intestinal villi destruction
- New research questions this
- Cell damage is observed
- Unclear that it is the gluten

** Also called Non-Celiac Wheat Sensitivity

If not gluten, then what?
- Almost 1/3 of adults in US have digestive sensitivities
  - Symptoms are similar to celiac disease
  - Certain CHO’s can be difficult to digest
    - F - fermentable
    - O - oligosaccharides
    - D - disaccharides
    - M - monosaccharides
    - And
    - P - polyols

High / Low FODMAP Grains

<table>
<thead>
<tr>
<th>HIGH</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>Buckwheat</td>
</tr>
<tr>
<td>Bran</td>
<td>Corn</td>
</tr>
<tr>
<td>Cous cous</td>
<td>Oats</td>
</tr>
<tr>
<td>Rye</td>
<td>Quinoa</td>
</tr>
<tr>
<td>Semolina</td>
<td>Rice</td>
</tr>
<tr>
<td>Spelt</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td></td>
</tr>
</tbody>
</table>
Wheat Allergy

- Allergy to the whole protein component in wheat.
- Evidenced by allergic reaction
  - Swelling, itching or irritation—especially around mouth
  - Nasal congestion
  - Itchy watery eyes
  - Difficulty breathing
  - Anaphylactic shock (swelling of throat, rapid heartbeat, dizziness/fainting)

“True” wheat allergy considered rare
- Affects 0.4% of children and 0.5% of adults
- ~65% of children typically outgrow
- ~75% of all grain products in the US contain wheat flour
- Hidden sources: processed foods, cosmetics, bath products, play dough, medications, lotions

Wheat Allergy No:
- Wheat
- Triticale (Wheat + Rye)

- Generally tolerated grains:
  - Amaranth
  - Barley
  - Buckwheat
  - Corn
  - Millet
  - Oats
  - Quinoa
  - Rice / Wild Rice
  - Rye
  - Sorghum

Celiac Disease (CD)
Gluten Sensitivity (GS)
Wheat Allergy (WA)

<table>
<thead>
<tr>
<th>Time between gluten exposure &amp; symptoms</th>
<th>Celiac Disease (CD)</th>
<th>Gluten Sensitivity (GS)</th>
<th>Wheat Allergy (WA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours – Days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergen related</td>
<td>Autoimmunity</td>
<td>Immunity (Innate)</td>
<td>Allergic Immune Response</td>
</tr>
<tr>
<td>HLA (the genetic testing)</td>
<td>HLA DQ2/8 restricted (~97% positive)</td>
<td>Not HLA DQ2/8 restricted (95% positive)</td>
<td>Not HLA DQ2/8 restricted (35-40% positive)</td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>Always present</td>
<td>Always absent</td>
<td>Always absent</td>
</tr>
<tr>
<td>Enteropathy (Inflammation of GI tract)</td>
<td>Always always present</td>
<td>Always absent</td>
<td>Always absent</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Both intestinal and extra intestinal (indistinguishable from CD &amp; WA when presenting with GI symptoms)</td>
<td>Both intestinal and extra intestinal (indistinguishable from CD &amp; WA with GI symptoms)</td>
<td>Both intestinal and extra intestinal (indistinguishable from CD &amp; WA when presenting with GI symptoms)</td>
</tr>
</tbody>
</table>

Adapted from the book Gluten Freedom by Alessio Fasano, MD

For a Wheat-Free Diet

Avoid foods that contain wheat or any of these ingredients:
- Spelt
- Durum wheat
- Durum wheat flour
- Farro
- Kamut
- Khorasan wheat
- Little wheat
- Freekeh
- Barley
- Rye
- Oats
- Quinoa
- Rice / Wild Rice
- Rye
- Sorghum

www.foodallergy.org

Adapted from the book Gluten Freedom by Alessio Fasano, MD
Ingredients in packaged products may change without warning.

Check ingredient statements every time you shop/purchase.

If in doubt call the manufacturer.

Labeling Law
- MUST call out wheat
- Any source of wheat must be identified
- Wheat free is not guaranteed
- No requirement to call out barley or rye

Labeling Law
- Gluten is not a required disclosure
- Labelling gluten-free is optional
- IF labeled gluten-free rules must be met
  - GF means the food does NOT contain:
  - An ingredient that is a gluten-containing grain
  - An ingredient derived from a gluten-containing grain
  - Unless it has been processed to remove the gluten
  - <20 ppm of gluten is threshold
  - Example: 1 kg (1 million milligrams) must have less than 20 mg of gluten

Reminders
- Avoid Cross-Contact
  - Separate storage, prep areas, utensils...
- Train staff
  - Consider vulnerable patients/residents
  - Report incidences

Resources / References
- Celiac Disease Foundation
  - www.celiac.org
- The Gluten Intolerance Group
  - www.gluten.org
- National Foundation for Celiac Awareness
  - www.celiaccentral.org
- Celiac Sprue Association
  - www.celiacplus.org
- Gluten-Free Drugs
  - www.glutenfreedrug.com
- Gluten Free Watch Dog
  - www.glutenfreewatchdog.org

Apps
- Find Me Gluten Free
- Identifies eateries with GF options
- Triumph Dining Cards
- Print & App
- Various cuisine & languages
- Explains GF diet

Thank you for participating in today’s session!

This presentation is intended to provide general information about the gluten free diet but is not intended to provide medical advice.

Presentation Author: Debra Zwiefelhofer, RDN, LD

Is this gluten free?

Fiesta Lime Chicken®
Grilled chicken done fiesta-style with zesty lime sauce, Mexi-ranch and Jack-cheddar. Served with crisp tortilla strips, seasoned rice and freshly-made pico de gallo.

What questions would you have before you ordered?

Post - Test

Is this gluten free?

Where is the Wheat?

Fiesta Lime Chicken®
Grilled chicken done fiesta-style with zesty lime sauce, Mexi-ranch and Jack-cheddar. Served with crisp tortilla strips, seasoned rice and freshly-made pico de gallo.

What questions would you have before you ordered?

Hint: You should find 7-8 suspect menu items