

# **Association of Food and Drug Officials**

Tuesday, June 23, 2015

Mary Schluckebier, BS, MA



## **Celiac Support Association**



# Objectives

Gluten induced conditions

Celiac consumer mindset

Identify food supply concerns

Identify food distribution concerns

Terminology, marketing and regulations



# **Celiac disease is...**

A hypersensitivity

An autoimmune disease

An inflammatory disease

A malabsorption disease

A systemic disease

A common genetic disease -- world wide

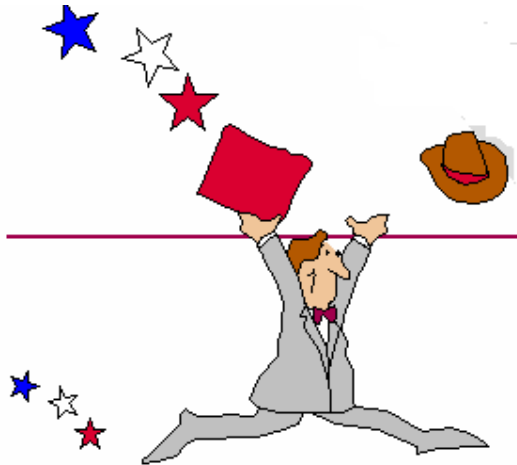
Triggered at any age

For life after triggered

Rarely diagnosed in a timely manner

# Who has celiac disease?

- 2012 NHANES multi-center study 1:141 in US
- 1% of population world wide
- Estimated 15% diagnosis rate
- 10-11 years delay in diagnosis in 1998
- Refractory celiac disease I and II

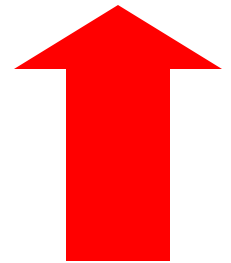


# Reality of living with celiac disease

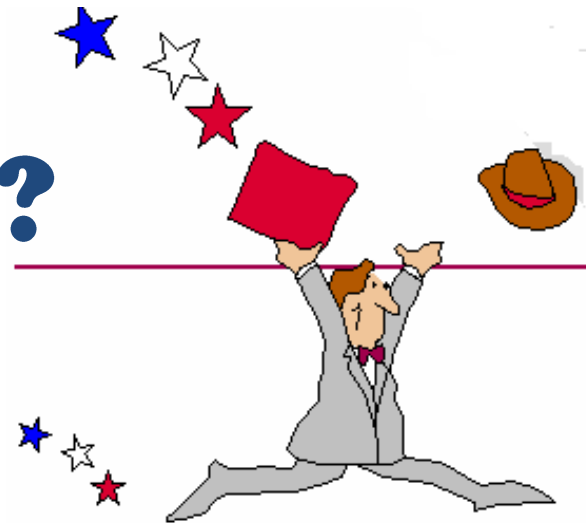
## Undiagnosed – untreated

Peter Green Research Columbia University

- Risk of cancer 200-300%
- Risk of miscarriage 800-900%
- Healthcare annual costs \$14.5-\$34.8 billion  
10 years from symptoms to diagnosis



# Who catches celiac disease?



- Genetic predisposition
- Exposure to an environmental “trigger”
- Consume foods containing specific prolamins and glutelins most prevalent in wheat, barley, rye and to a lesser degree oats – crosses and derivatives.



# **Diagnosis is important**

- To eliminate other health conditions
- To avoid unnecessary limitation of foods
- To communicate dietary needs:
  - School situations
  - Hospitalizations
  - Emergency situations
  - Benefit from ADA Title 2

# Diagnosis and treatment

- Celiac Blood Panel --- antibodies
  - tTG (IgA anti-tissue transglutaminase)**
  - EMA (Endomysial Antibody)**
  - DGP (Deamidated Gliadin Peptide)**



- The "gold standard" for diagnosis is a positive small bowel biopsy
- Positive response to a gluten-free diet



# Genetics



**30-40%** of Americans have genetic predisposition for celiac disease. **1%** will have active celiac disease. **20%** will pass active celiac disease to the next generation.



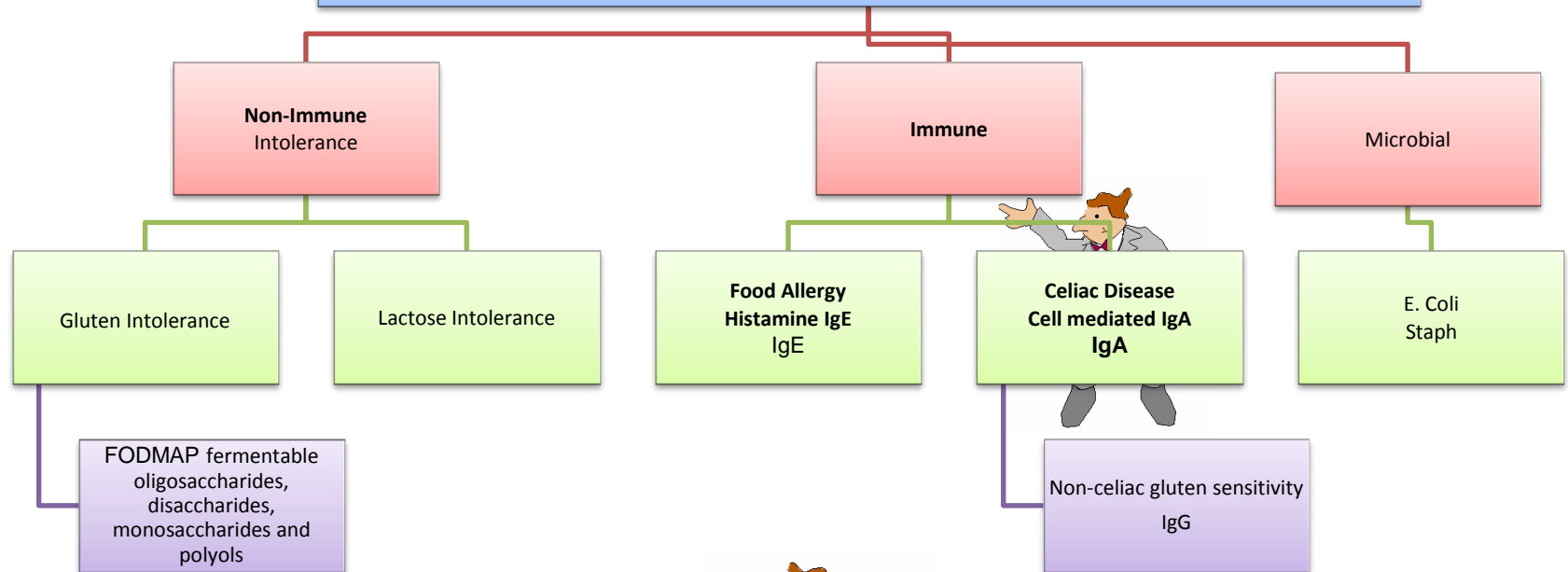
# **Adverse Reactions to Foods**

**Non-Immune  
Intolerance**

**Immune**

**Microbial**

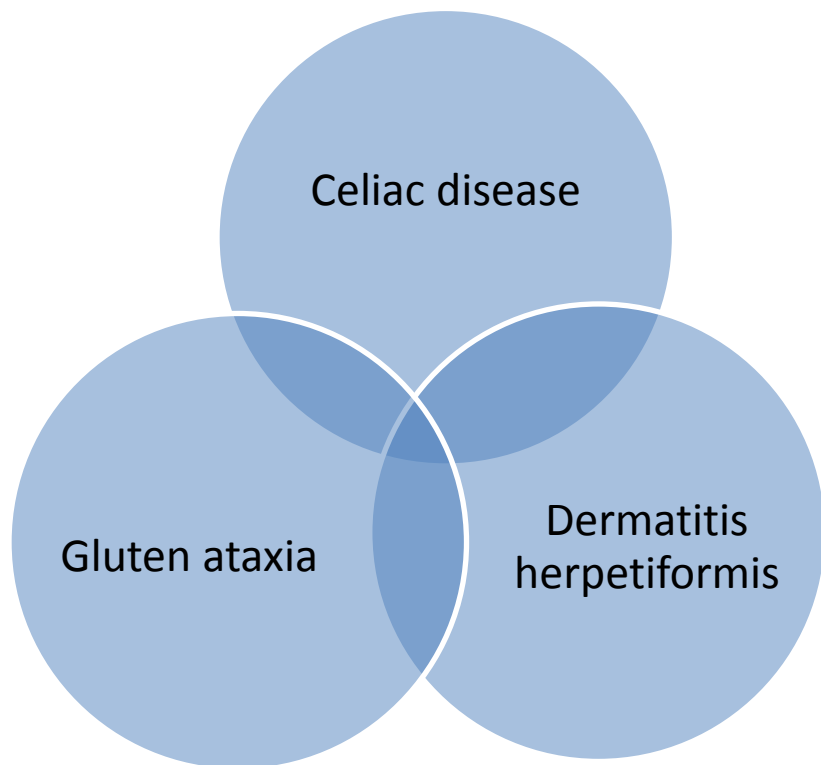
# Adverse Reactions to Foods



## Approaches to Establish Thresholds for Major Food Allergens and for Gluten in Food

FDA Threshold Working Group March 2006 Figure II-1;  
<http://www.cfsan.fda.gov/~dms/alrgn2.html#fig-ii-1>

# Long way from definitive answers



Baker's  
Asthma



Non-celiac gluten  
sensitivity



Gluten-free –  
just because



# The Gluten Wars

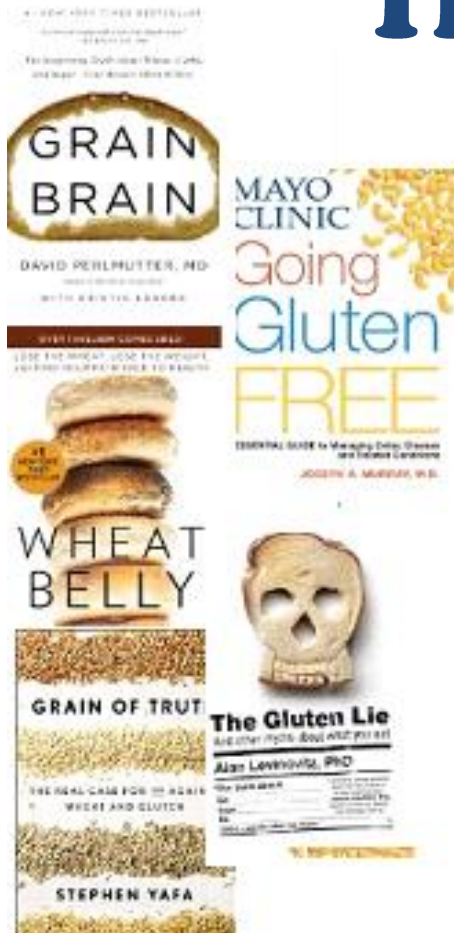
TIME

Book Review:

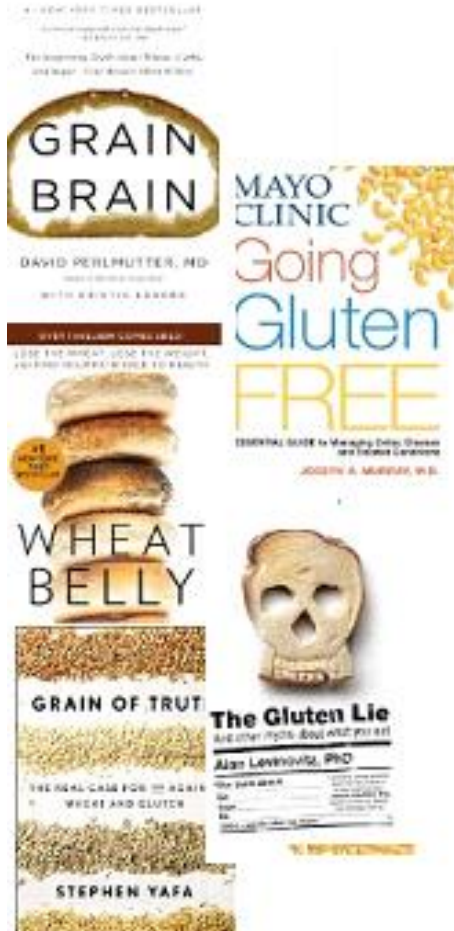
**“But while both books add to the conversation around gluten paranoia, we’re still a long way from definitive answers about whom gluten affects and why.”**

**Siobhan O'Connor**

**Time Magazine June 15, 2015 The Gluten Wars p 54-55**



# Celiac consumer mindset

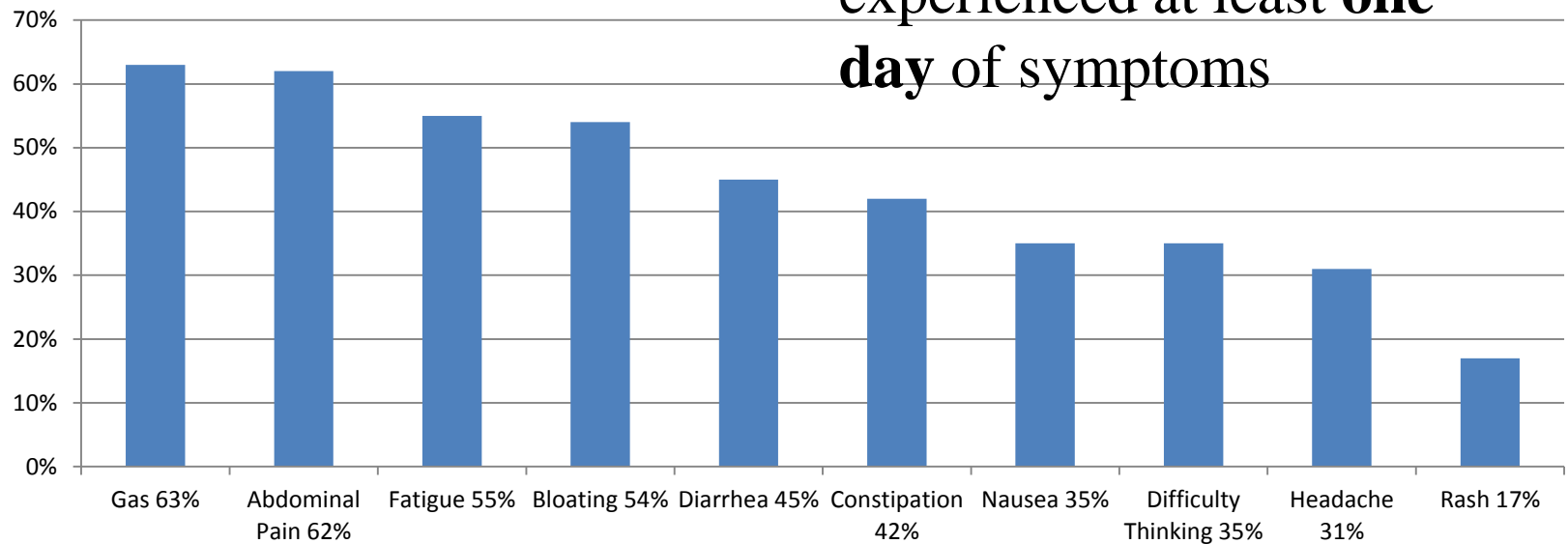


“As for me, I’m stuck with this diet for life, comforted by the fact that food doesn’t make me feel sick anymore---even if I still miss those croissants.”

**Siobhan O'Connor** Time Magazine  
June 15, 2015 The Gluten Wars p 54-55

# One week of reported Symptoms

**90% of patients  
experienced at least **one**  
day of symptoms**



202 Patients

Daniel A. Leffler, MD David Adler, MD Alvine.

# Prevalence rate of celiac disease

Diagnosed 15%		Prevalence 1%	Population Estimated Used
Celiac Disease in North America (Extrapolated Statistics)			
USA	481,140	3,207,600	320,760,000
Canada	53,017	353,450	35,344,962
Mexico	179,570	1,197,132	119,713,203

**2,726,460 undiagnosed**





# **Why are there more people with celiac disease?**

- More environmental stress?
- Wheat consumption is down not up
- Fine milled flour – wheat and barley?
- Antibiotics and vaccines?
- Longer lifespan

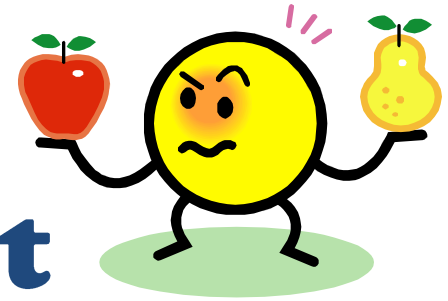


# **Adapt**

## Manage RISK

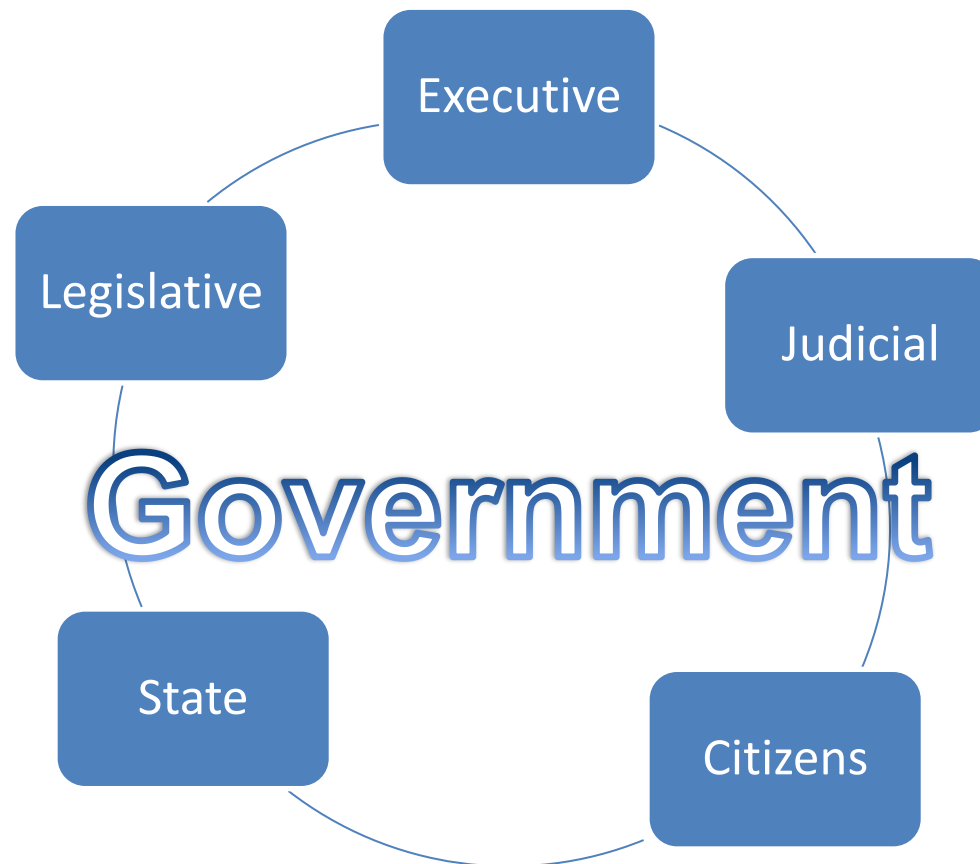


# **RISK management responsibility**



- Design decision-making process to maintain optimal health
- Gather and evaluate information
- Initiate coping techniques
- Improve skills
- Adapt information to meet personal needs
- Establish a health team

# **Food safety shared responsibility in U.S.**



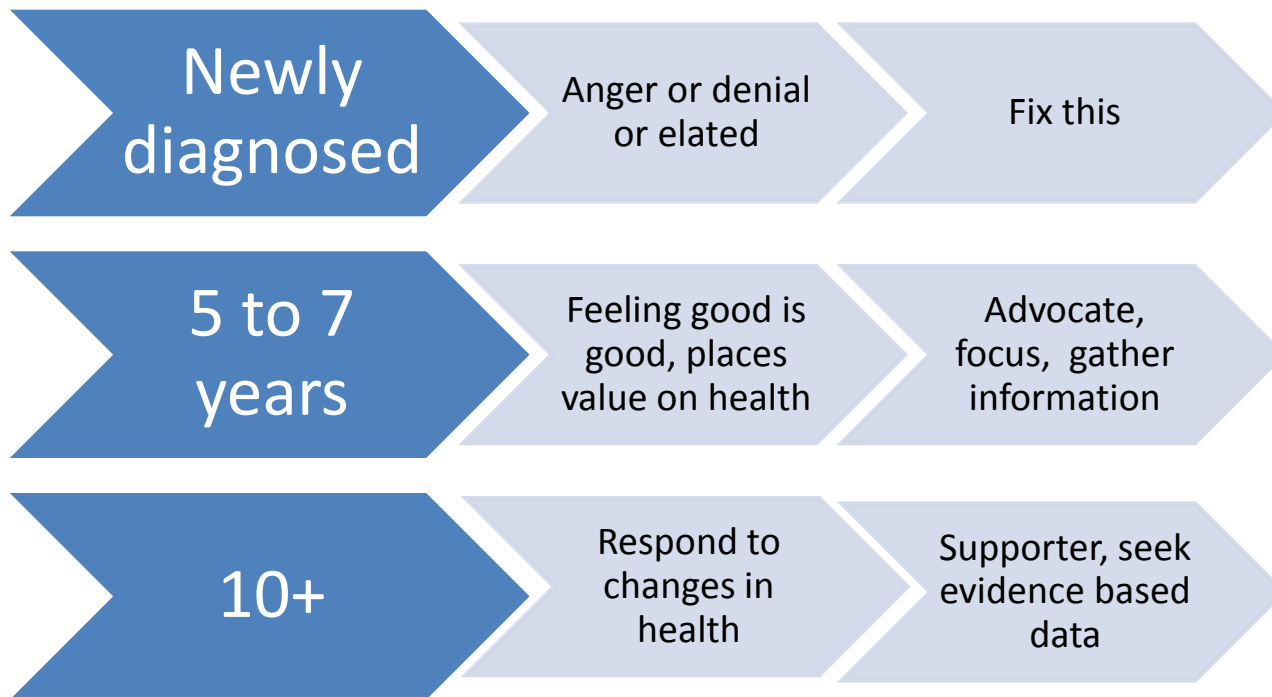


# Responsibility of patient

- Design own decision-making process to maintain optimal health
- Seek information to evaluate choices
- Read Labels
- Contact food companies
- Advocate

Citizens

# Ages of a person with celiac disease





# **Developing Celiac Disease**

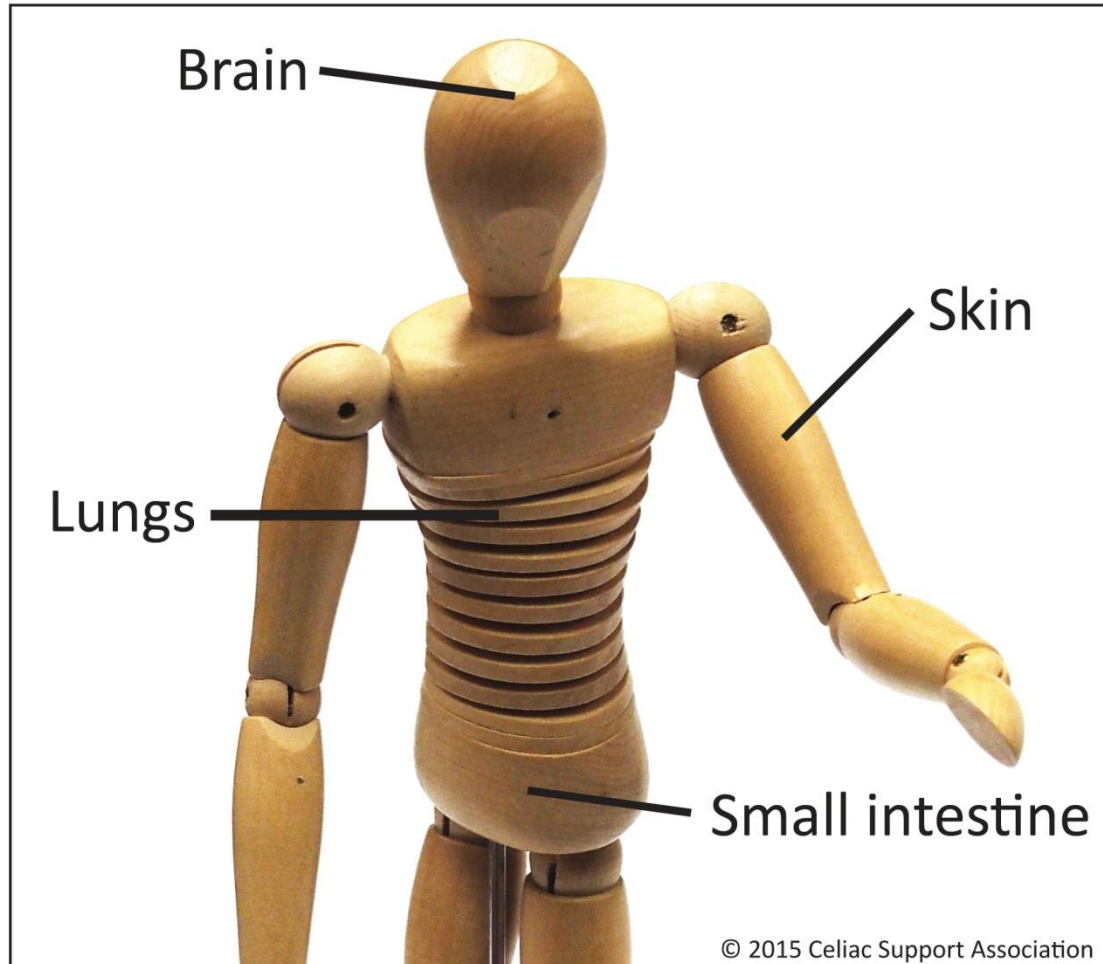


# In a person with celiac disease

- Protein “gluten” fractions not breaking down to simple amino acids are misidentified as an enemy to the body and jump start the immune system.
- A cascade of responses involving innate and adaptive immune systems. The main target is the **epithelial** cells.
- Antibodies produce transglaminase enzymes.
- Inflammation is followed by malabsorption.



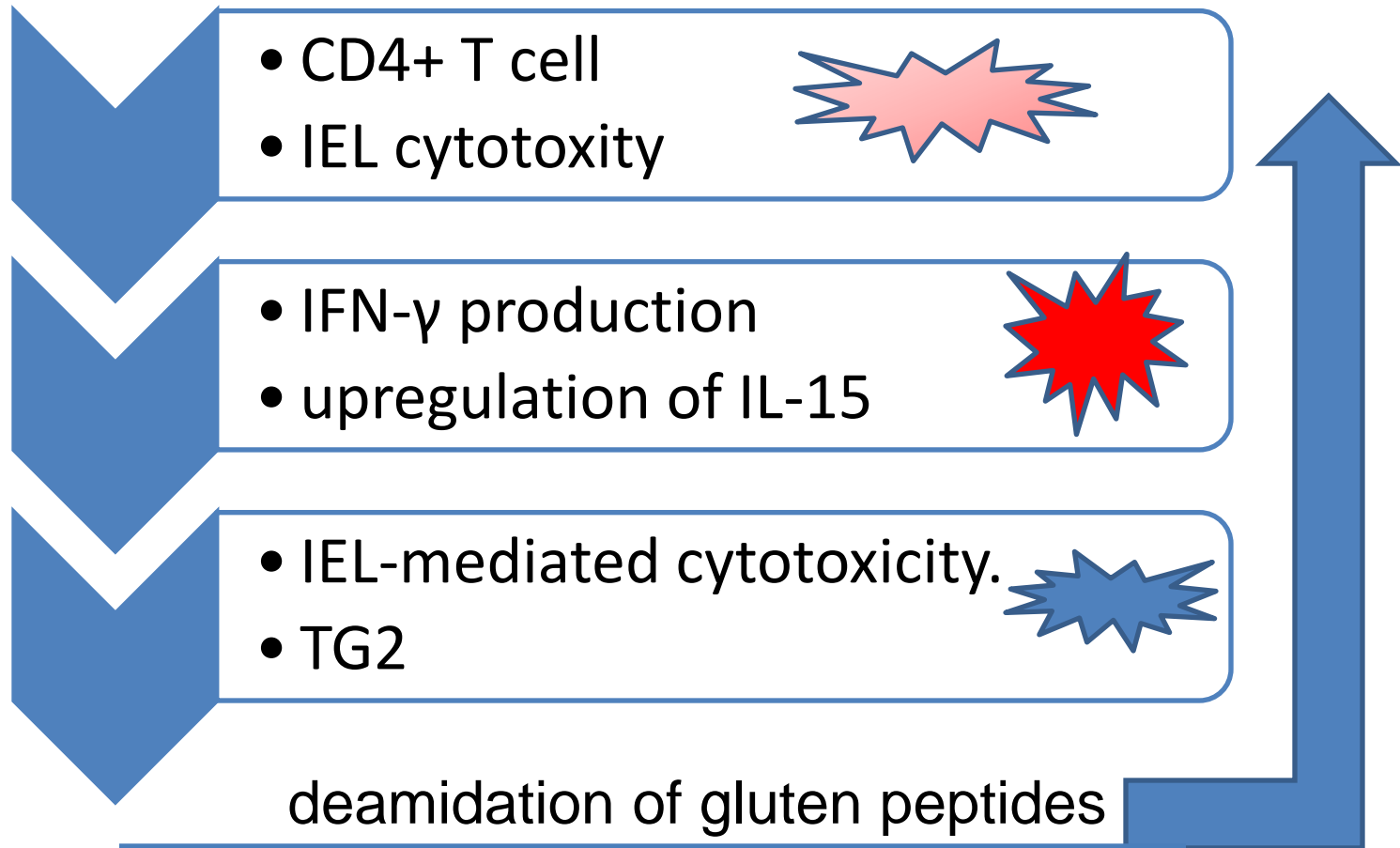
# The body is full of epithelial cells



© 2015 Celiac Support Association

Epithelial cells, like the villi, are susceptible to damage by the misdirected immune system.

# Self-amplifying loop



# Development of celiac disease



HLA DQ2  
DQ8  
//



CD4 T  
cells

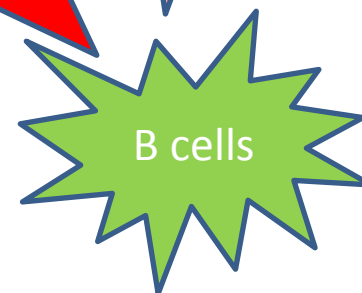
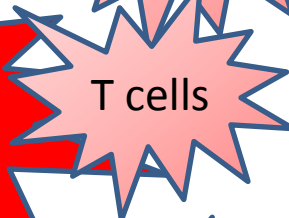
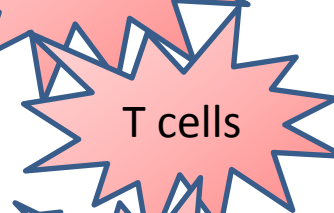
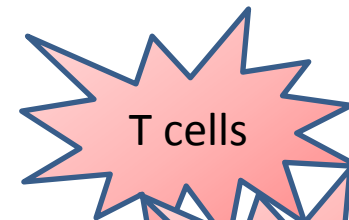
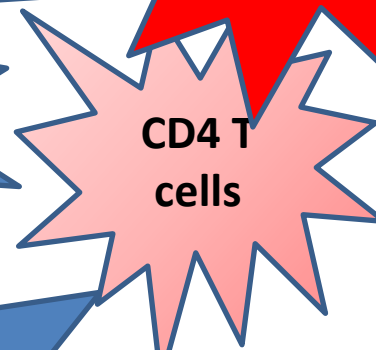
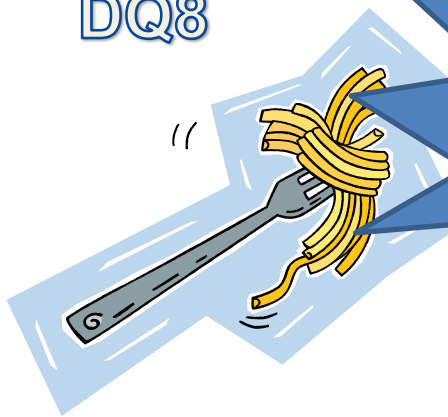
IFN- $\gamma$   
inflammation

Leading to TG2 release  
and Tissue Damage

# Active celiac disease



HLA DQ2  
DQ8



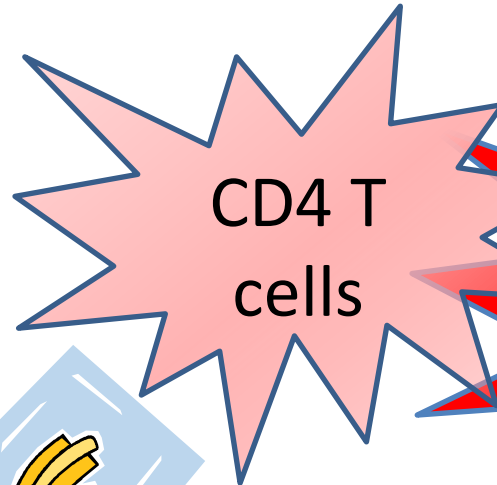
# Stop the damage Start healing



HLA DQ2  
DQ8



CD4 T  
cells



IFN- $\gamma$   
inflammation



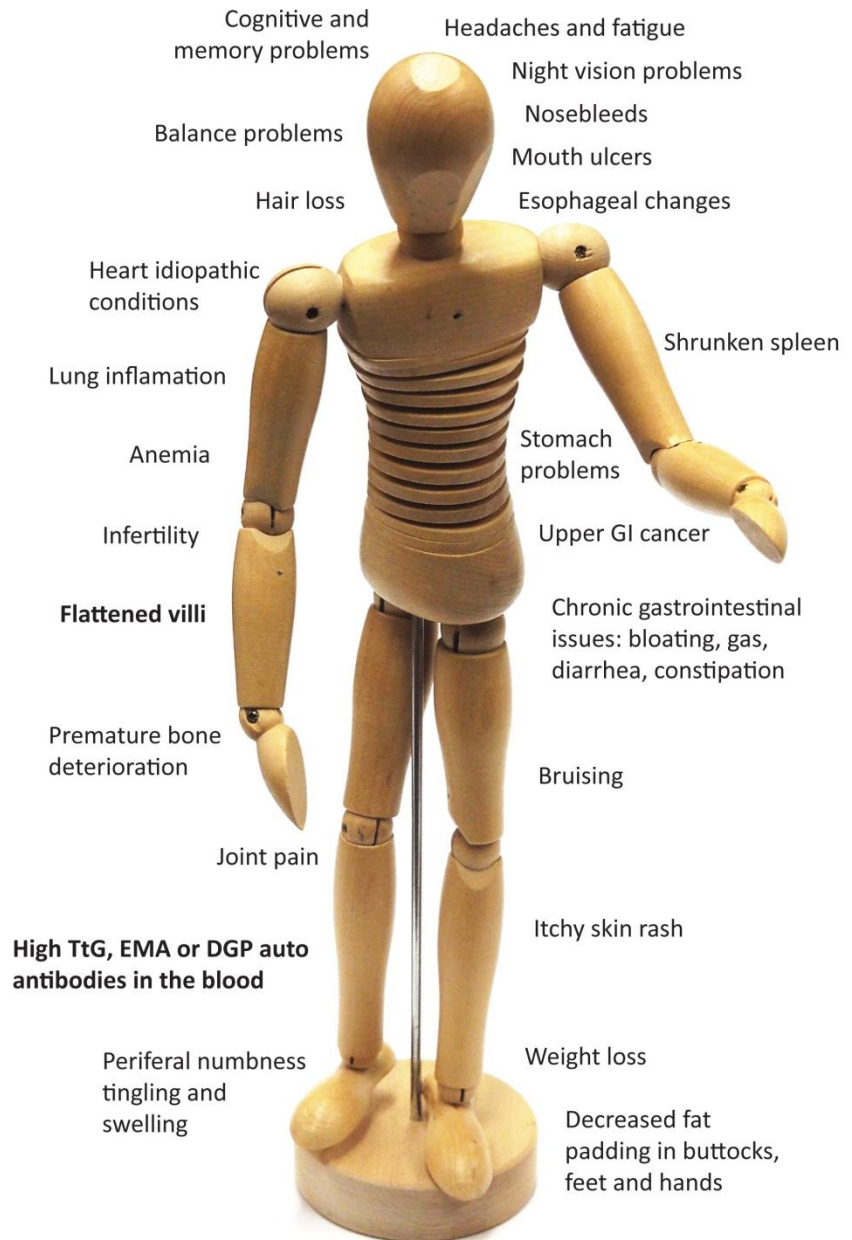
Leading to TG2 release  
and Tissue Damage



**For life – eliminate  
wheat, barley, rye and  
some oat varieties and  
cross-contaminated  
products**



# Signs and symptoms of celiac disease



© 2015 Celiac Support Association



# Patients newly diagnosed symptoms

- Chronic diarrhea: 35%
- Joint pain: 29%
- Abdominal pain: 28%
- Fatigue: 26%
- Constipation: 20%
- Asthma: 7%
- Type 1 diabetes mellitus: 7%
- Osteoporosis: 6%
- Peripheral Neuropathy: 5%  
small fiber neuropathy 16%

Neurology Russell Chin, MD; Norman Latov, MD; Peter  
HR Green, May 2003

"Prevalence of Celiac Disease in At-Risk and Not-At-Risk Groups in the United States," Archives of Internal Medicine, Feb. 10, 2003



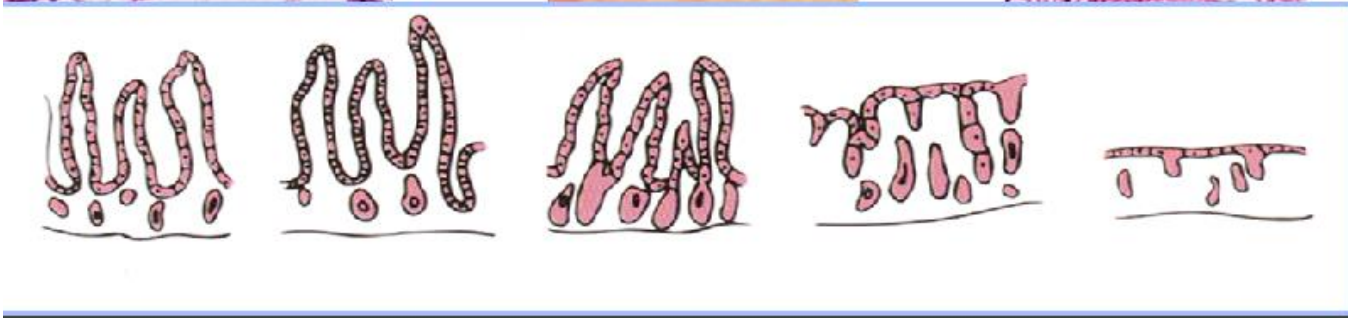
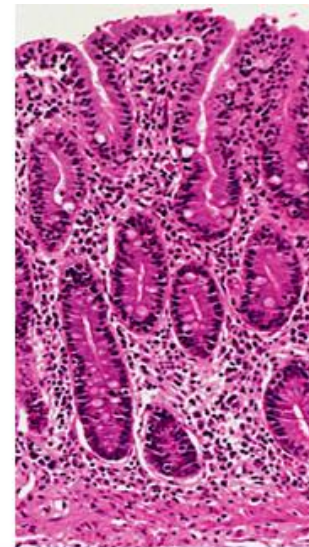
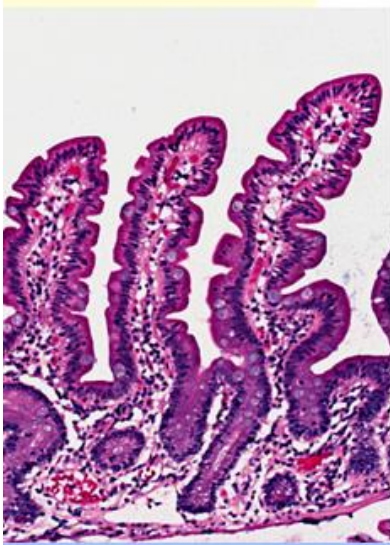


# TWO YEARS

## **Pathology damage**

- Poor correlation of symptoms and pathology damage
- Symptoms may occur in a multitude of organs
- Symptoms resolve before mucosal restoration

# Mucosal health





# Common deficiencies

Fiber

Vitamins

Vitamin D

Folate

Riboflavin (B2)

B 12

Niacin (B3)

Minerals

Calcium

Iron

Magnesium

Source: Kupper C. Dietary guidelines and implementation for celiac disease. Gastroenterology 2005; 128:S121-S127.

# Gold Standard -- zero

- Completely eliminate toxic fractions (prolamins & glutelins)
- From genus triticum, secale, hordeum, some avena (limit ½ cup dry per day)

Some ---- 0 ---- None



# Gluten containing grain

- Prolamins and glutelins, grains or crossbred hybrids e.g., triticale
- Wheat, any species belonging to the genus **Tritium**
- Rye, any species belonging to the genus **Secale**
- Barley, any species belonging to the genus **Hordeum**



# **Food Allergen Labeling and Consumer Protection Act of 2004**

## **Exemptions**

- Restaurants
- Oils
- Grains – grain standards regulated

# Celiac profile

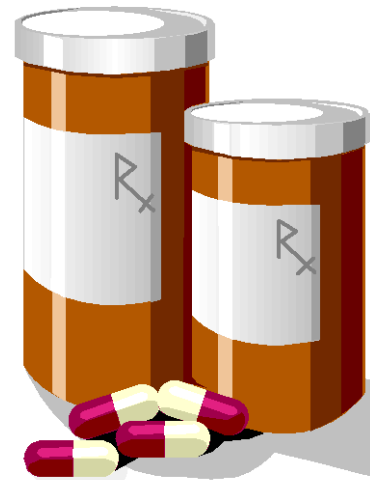
- No known personal gluten threshold
- No home monitoring devices or drugs
- Damage is cumulative
- No simple test for all amino acid fractions in foods
- Treatment - is strict elimination of gluten for life
- Health complications most common in those not keeping a STRICT diet



-National Institutes of Health (NIH)

# Concerns

- Medications OTC and Prescribed
- Hepatitis B vaccination -- non-response
- Grain standards and commodity policies
- Source or full disclosure labeling
- Terminology
- Hydrolyzed and fermented ingredients from gluten source







# Nutrition Labeling and Education Act 1990

- Manufacturer is responsible for declaring what is **in** the product
- Use of **free** implies none and if not true product considered mislabeled
- CSA Requested gluten-free to be defined
- FDA Response -- better to use common names of parent grains:  
wheat, barley, rye, oats



# **Benefits of a standardized definition**

- provide a clearly codified definition of the term, thereby

**eliminating any uncertainty/  
misunderstandings on labeling products.**

<http://www.cfsan.fda.gov/~dms/glutqa.html#q1>

# Cross-contact concerns field to fork

For those with food allergies and celiac disease



# Cross-contact concerns field to fork



[www.theguardian.com](http://www.theguardian.com)



**Organic Mushroom Growing Kits**



[www.organicfarmingblog.com](http://www.organicfarmingblog.com)

*Copper Kettle Farm's 2012 garlic crop (early season).*

*Seedstock.com*



# Easier to prevent than remove



Same lentil product batch tested less than 5 ppm gluten Neogen ELISA.



# “May contain” statements

FDA’s perspective, is claim **truthful and not misleading** under FDC Act § 403(a)(1)

- Voluntary manufacturers
- Must be truthful and not misleading
- No laws govern or require these statements
- FDA’s guidance to the food industry on this issue,
  - advisory labels should not be used as a substitute for good manufacturing practices
- Manufacturers use advisory labeling for a variety of reasons
  - to advise consumers of the potential presence of an allergen
  - to avoid the need to develop and use multiple labels
  - to reduce legal liabilities.
- **If you are unsure, call the manufacturer to ask about their ingredients and manufacturing practices.**

# Not regulated

- “made with no gluten-containing ingredients”
- “not made with gluten-containing ingredients”
- Unless used with “gluten-free”
  - “no gluten”
  - “free of gluten”
  - “without gluten



# Celiac shopper in action



Navigating the hidden dangers





# Shelving Strategy



Mike's Fresh Market, Seward, NE



# Mail Order

Company direct  
Home delivery  
On-line merchant  
Specialty store  
Buying clubs  
Wholesale  
Imports



Mike's Fresh Market, Seward, NE





# Commercial testing

## Sandwich Enzyme Immunoassay

Food allergens are protein fractions in food that can evoke an immune response in sensitive individuals.

Gluten is the characteristic term for the protein mixture of glutelins and gliadins (prolamins) found in cereals. **The proportion of glutelin to gliadin in the protein mixture is approximately the same.**



# How much gluten?

- Wheat flour 10,000 ppm
- Wheat bread 8,000 ppm
- Wheat starch 150 ppm
- Wheat maltodextrin 20 ppm
- Wheat glucose syrup less than 20 ppm BDL
- **Codex Alimentarius Voluntary 20 ppm**

June 2008

# Cast iron corn bread pan



<i>Testing Method</i>	<i>Results</i>	<i>Interpretation</i>
Dawn Dish soap	Grey/Purple	Caution/Fail
<b>Vinegar</b>	<b>Green</b>	<b>Pass</b>
Tide rotary brush	Grey	Caution
Goop	Grey	Caution
<b>Steel Bristles</b>	<b>Green</b>	<b>Pass</b>

# Sale of gluten-free foods

- Provides food companies with a benchmark for marketing and legal implications
- Supplier information – required by FDA Food Modernization Act 2011
- Encourage international GF imports
- Implications of ADA - compliance
- Growing market segment



"TIME TO PLAY GLUTEN ROULETTE!"

# Gluten-Free FDA Regulation

## Intentions



- Truthful and not misleading labels
- Packaged food
- Reduce shopping time for those with celiac disease
- Protect health of those with celiac disease
- Does not address Non-Celiac Gluten Sensitivity



# Gluten-Free FDA Regulation

“Some individuals with celiac disease may be unable to tolerate whatever level of gluten we might specify.....consumers who are sensitive to gluten at this higher level would no longer be able to rely on gluten-free claims to identify foods that are safe for them to eat and would need to take other steps to identify these foods.”

▪





# Terminology

- Voluntary
- Cross contact      -      Cross contamination
- Avoid                -      Eliminate
- Safety                -      Risk
- Labeling Gluten-free

FDA Regulation 20 ppm gluten for international trade  
US marketplace was at 5 ppm gluten or less

# **Fermented and hydrolyzed products**



We plan to issue a proposed rule to address our compliance approach to fermented or hydrolyzed products.

<https://www.federalregister.gov/articles/2013/08/05/2013-18813/food-labeling-gluten-free-labeling-of-foods>



# **Details on the regulation impact to the gluten-free community**

- Perspectives

**May 2011 FDA's Health Hazard Assessment  
("Gluten-Report")**

**The Peer Review of the Hazard Assessment**

**Docket FDA-2005-N-0404**

# Details on the regulation impact to the gluten-free community



May 2011 FDA's Health Hazard Assessment ("Gluten-Report")  
page 45 and 46

...safety assessment The LOC (levels of concern) values for gluten in food that correspond with these TDI (tolerable daily intake) values at the 90th percentile **level of intake are less than 1 ppm** for both morphological (~0.5 ppm) and clinical (~0.02 ppm) adverse effects.

# Ultimate testing device

## Gluten Analysis

- Accurate testing device is our own body
- **Commercial Allergen Analyses Kits**
  - Neogen Corporation, Lansing, MI
  - R-Biopharm Inc., Marshall, MI
  - Romer La AgraQuant bs Gluten G12
  - LCMS, LLC – Mass Spectra





# **Food Allergen Labeling and Consumer Protection Act of 2004**

**(Public Law 108-282, Title II)**

## **SEC. 203. FOOD LABELING; REQUIREMENT OF INFORMATION REGARDING ALLERGENIC SUBSTANCES.**

21 USC  
343 note

(b) Effect on Other Authority.--The amendments made by this section that require a label or labeling for major food allergens do not alter the authority of the Secretary of Health and Human Services under the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) to require a label or labeling for other food allergens.

HHS May add  
other food  
allergens



# Marketplace Terms

Cross Contact - Cross Contamination

Gluten-Free

Conditional Statements “May Contain ...”

Identity Preserved Produce and Grains

Country of Origin (COOL)

Raw

Organic

Natural

Genetically modified organism (enhanced)

Commercial agriculture



# **Terms continued**

## Grocery – Farmers' Market

delivery, storage, display, samples, conveyor belt at check out.. Hands and broken packaging; air quality.

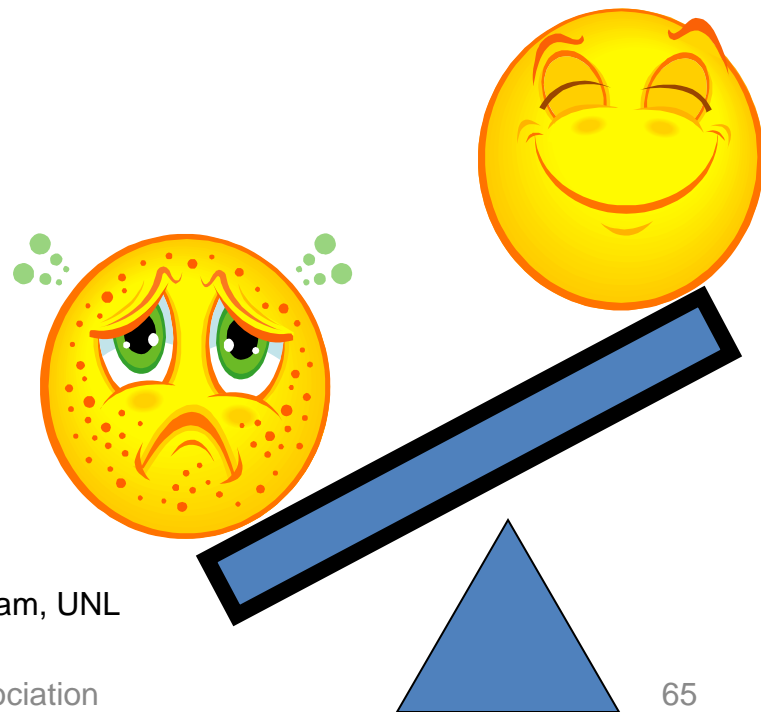


# Accessing the data

- Barley malt syrup and extracts
  - 1800 ppm - 2024 ppm gluten
- Wheat starch modified, refined, pre-gelatinized
  - 13 to >5000 ppm gluten

## Balancing act?

- <5-50 milligrams



Food Allergy Research and Resource Program, UNL



# **Food Service Hospitality and Service**



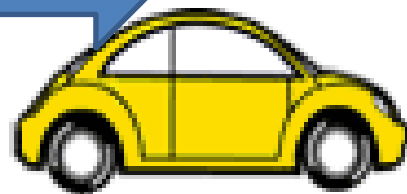
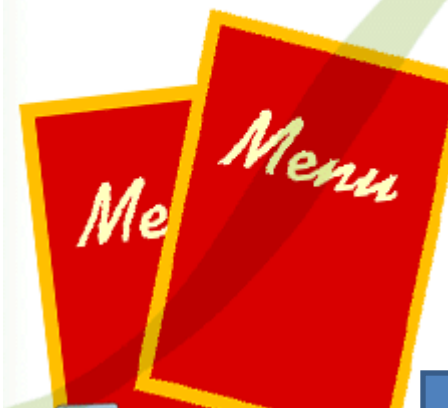
# Restaurant Atmosphere

- Foster Hospitality - Foster Service
- Spotless front door and restrooms are assuring.
- General tidiness
- Subtle aspects build confidence in guest
- Host or hostess are familiar with the menu and with various food concerns to greet the guest appropriately. It might be “Would you like to talk with the chef?”
- Money handling and food handling are separate
- Drink glass rim is far from the servers fingers



# **Food Service Thinking to protect consumer**

- BUILD CONSUMER CONFIDENCE
- Know the company and product line
- Display to eliminate cross-contact
- Segregate product ? check out
- Clean tables and counters – wash hands
- Clean sufficiently



# Take-Out

- Clam Shell
- Chinese Take-out Box
- Corrugated Box - Coated? Lined with???





# Summary

Celiac disease is common

Largely under diagnosed

Lacks medical treatment

Gluten free diet in a culture using wheat

Food ingredient source identification

Regulations ( Food Allergy Labeling Act of 2004)

Definitions: threshold unknown

Verification and standardization



# **Celiac Support Association**

Serving the  
Gluten-Free  
Community  
40 + years





# Partner with CSA

- Join CSA -
- Consultations – CSA network of dietitians, chefs, health care professionals and people with celiac disease
- Promotions /Fundraising
- Consumer Recognition
- Recipes
- Consumer Tips and Information
- Demonstrations – Cooking Schools



# **Solution Centered on Wellness**

Thank you

Mary Schluckebier, BS, MA  
Executive Director Celiac  
Support Association

CSA's emphasis is on education, research, and support for the self management of the celiac lifestyle.

Things are a changing...

## Predictors of Persistent Villous Atrophy

Adherence to gluten-free diet

Age

Other host or environmental factors

Education

Number of survey responses	Pills Taken Each Day	Percentage
13	0	8%
52	1-5	31%
58	6-10	35%
18	11-15	11%
14	16-20	8%
9	21-25	5%
2	26-50	1%
1	53	Based on CSA Lifeline, 2014 Issue 3, survey results from 167 responses.  1%
Total: 167		100%

## Predictors of Persistent Villous Atrophy

Aliment Pharmacol Ther. 2014;39:488-95