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# Gluten Neurologic Problems and a Fermentation Solution

Bill Code MD

# Natural history of Wheat allergy

- one of most common food allergies in children
- study per C. Keet et al at Johns Hopkins
- average American eats 130 lbs/year

Ann Allergy Asthma Immunol.  
2009;102:410-415

# Wheat Allergy

Highly atopic:

- 87% had eczema
- 67% had asthma
- 60% allergic rhinitis

One half “outgrow” by age 6.5 years

# Baker's asthma

N. Salvatori et al

- asthma induced by inhalation of flour in adults with food allergy to wheat
- wheat and other grains half of our protein supply
- may tolerate wheat orally

Clinical & Experimental Allergy  
38, 2008, 1349-1356

# Wheat dependent exercise-induced anaphylaxis (WDEIA)

per H. Matsuo et al

- severe form of allergy
- wheat pre-exercise may trigger anaphylaxis
  1. low blood pressure
  2. shortness of breath
  3. urticaria ie hives all over
- due to  $\omega$ -5 gliadin

Allergy, 2008;63:233-236

# Hypersensitivity to hydrolyzed wheat proteins in cosmetics

per M. Lauriere

- hydrolysis is to make gluten soluble
- hydrolysis with acid or enzymes
- 9 patients described with contact urticaria ie hives
- all tolerant to oral wheat products

Contact Dermatis 2006, 54:283-289

# Wheat Allergy in Adults

J. Scibilia et al (Italy & Denmark)

- double blind, placebo controlled study
- raw, then cooked up to 25 grams
- 13 of 27 positive response (48%)
- as little as 1.6 grams
- selected on basis of suspected wheat allergy

J. Allergy Clin Immunol

Feb. 2006, Volume 117, 2, 433-439



# Wheat allergy in adults, 2.

- of 24 positive responses (raw and cooked)
  1. persistant skin redness 8
  2. general itchiness 4
  3. oral allergy syndrome 5
  4. hives 8 (1 exercise induced)
  5. angioedema 3
  6. abdominal pain 5 (1 exercise induced)
  7. nausea/vomiting 3
  8. asthma 2
  9. persistent cough 1
  10. runny nose 1
  11. migraine headache 3

# Anaphylaxis to wheat beer

per T. Hertinger, Germany

- case report severe anaphylaxis from wheat beer
- 59 year old man
- developed hives, angioedema and unconsciousness
- no problems with baker's yeast, hops or lager beer
- did react to wheat and barley flour

Ann Allergy Asthma Immunol  
2004;92:673-675

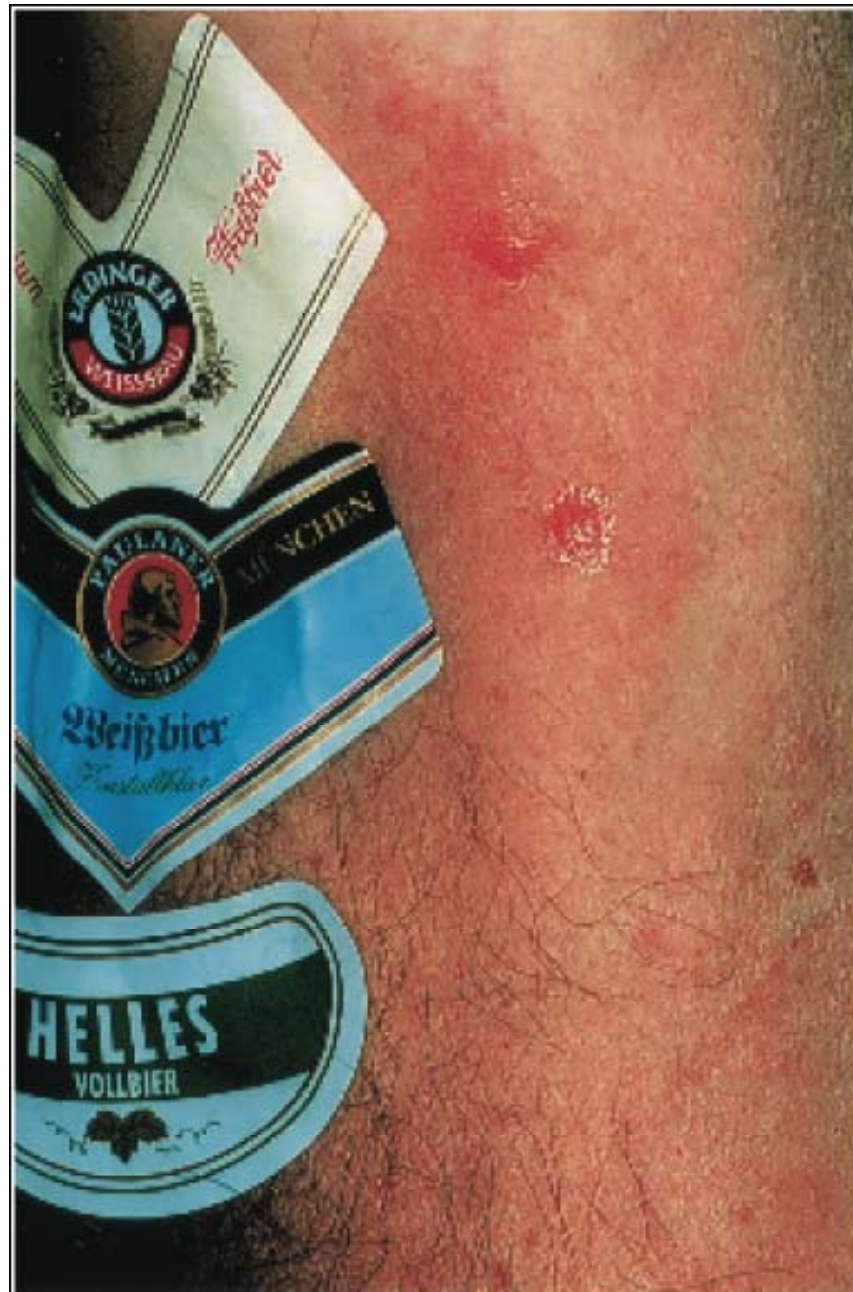


Figure 1. Skin prick test reactions on the ventral aspect of the patient's forearm with 2 wheat beers (top, Erdinger Premium Weißbier; middle, Paulaner Weissbier Kristallklar) and 1 lager beer (bottom, Augustiner Helles).

# Wheat allergy - different triggers:

1. IgE response in baker's asthma is mostly due to water soluble proteins
2. Allergy due to ingestion of wheat is alcohol-soluble gliadins and the acid/alkali soluble glutenins

# Neurologic Issues

1. Depression
2. ADHD Attention Deficit Hyperactivity Disorder
3. Epilepsy
4. Schizophrenia
5. Cognitive Impairment
6. Multiple Sclerosis
7. Migraine Headaches

# Gluten Component Concerns:

## Glutenins

- asthma and autoimmune skin disease

## Gliadins - especially alcohol soluble

- neurologic triggers
- inflammation triggers

# Mechanism

1. Leaky Gut Syndrome
2. Molecular Mimicry
3. Auto-Immune Response
4. Crossing Blood Brain Barrier

# Neurological problems in 72 Celiac patients:

Migraine headache 28%

Carpel tunnel syndrome 20%

Bladder dysfunction 14%

Epilepsy 6%

Cerebellar ataxia 6%

Vestibular dysfunction 6%

(Dec 15) Mov Disorders. 2009:  
24: 2358 - 2362



# Psychiatric problems in 72 Celiac patients

35% reported one or more of:

- depression
- personality changes
- psychosis

Mov. Disorders 2009

24: 2358 - 2362

# Incidence of Gluten Sensitivity

- more Western Ireland, Scotland and Finland
- evaded Roman rule and Roman grains
- short time to adapt to grains
- more so North America's First nations people
- 15% of population

Dangerous Grains, James Braly MD  
and Ron Hoggan MA: 2002

# Fermentation Solutions:

## -per R. DiCagno et al

1. Proteolysis by Sourdough Lactic Acid Bacteria: Effects on Wheat Flour Protein Fractions and Gliadin Peptides Involved in Human Cereal Intolerance
  - Lactobacilli
    - i) *L. alimentarius* 15M
    - ii) *L. brevis* 14G
    - iii) *L. sanfranciscensis* 7A
  - Albumin, globulin and gliadin hydrolyzed, not glutenins

Appl Environ Microbiol  
Feb, 2002, p 623-633

# Fermentation Solutions: per R.DiCagno et al

2. Pasta made from Durum Wheat Fermented with Selected Lactobacilli
  - majority of gliadin hydrolyzed
  - scores for stickiness and firmness some decreased
  - odour and flavour unchanged

J. Agric Food Chem, 2005  
53: 4393-44-2

# Fermentation Solutions per M. de Angelis

3. Probiotic Preparation has the Capacity to Hydrolyze Proteins Responsible for Wheat Allergy
- pooled sera from people with wheat allergy
  - if only pepsin and pancreatic some IgE binding proteins persisted
  - none persisted if probiotic USL#3 used
  - USL#3 is mixture of probiotic lactic acid and bifidobacteria

J. Food Prot, Vol, 70.No1, 2007  
p135-144

# Fermentation Solutions

## per M. Gobbetti

4. Sourdough lactobacilli and celiac disease
  - review use of selected sourdough lactic acid and probiotics as starters for sourdough fermentation
  - sourdough bread and pasta

Food Microbiology Vol 24, Issue 2, April 2007,p 187-196  
C. Rizzello, Appl Env Microbiol July 2007,  
Vol. 73, 14: p 4499-4507

# Fermentation Solutions

## per A.V. Moroni, Ireland

5. Sourdough in gluten-free bread-making: An ancient technology to solve a novel issue?
- ideal to improve texture, palatability, aroma and shelf life

Food Microbiology Vol 26, Issue 7,  
Oct 2009 p 676-684

# Summary:

1. Outline gluten/wheat allergy
2. Neurologic problems
3. Mechanism and Origin
4. Potential solutions

Book: Winning the Pain Game 2007,  
per Bill Code MD, Denise Code RD  
[www.drbillcode.com](http://www.drbillcode.com)