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Perdido Beach Resort

What is Gluten?

Derived from the Latin
word for GLUE

Gluten is a composite of
the proteins gliadin
and glutenin

Gluten makes dough
cohesive



A close-up photograph of a woven wicker basket overflowing with a variety of fresh breads. The breads include golden-brown rolls, some with a braided pattern, several long baguettes, and a large loaf of dark bread sliced into thin, uniform pieces. The lighting is warm, highlighting the textures and colors of the baked goods.

Wheat

Rye

Barley

Gluten is found in many food products!



- **Brown rice syrup**
- **Breading & coating mixes**
- **Croutons**
- **Energy Bars**
- **Flour or cereal products**
- **Imitation bacon**
- **Imitation seafood**
- **Marinades**
- **Pastas**
- **Processed luncheon meats**
- **Sauces, gravies**
- **Self-basting poultry**
- **Soy sauce and soy sauce solids**

- **Soup bases**
- **Stuffings, Dressing**
- **Thickeners (Roux)**
- **Communion wafers**
- **Herbal supplements**
- **Drugs & Over-the-counter medications**
- **Nutritional supplements**
- **Vitamins & mineral supplements**
- **Play Dough**
- **Malt Liquor**
- **Cosmetics**



Gluten May Be 'Hidden' in Foods

Check the Label for These Terms

- bread crumbs
- bran
- bulgur
- couscous
- cracker meal
- durum
- farina
- flour (*all purpose, bread, durum, cake, enriched, graham, high gluten, high protein, instant, pastry, self-rising, soft wheat, steel ground, stone ground, whole wheat*)
- gluten
- kamut
- matzoh, matzoh meal (*also spelled as matzo*)
- pasta
- seitan
- semolina
- spelt
- vital gluten
- wheat (*bran, germ, gluten, malt, sprouts*)
- wheat grass
- whole-wheat berries
- flavoring (*including natural and artificial*)
- hydrolyzed protein
- soy sauce
- starch (*gelatinized starch, modified starch, modified food starch, vegetable starch, wheat starch*)
- surimi

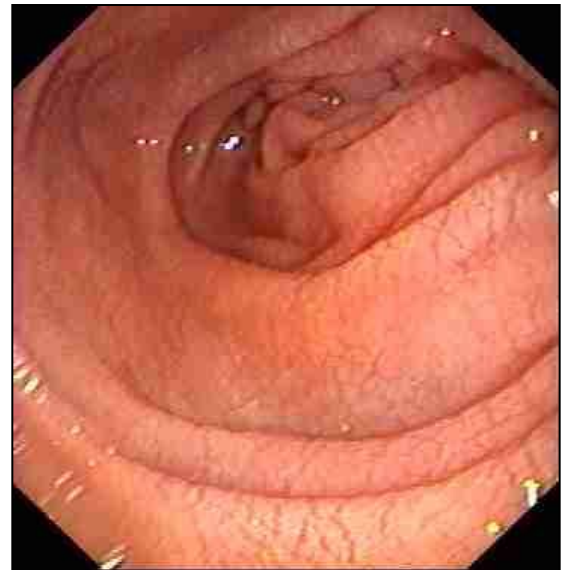
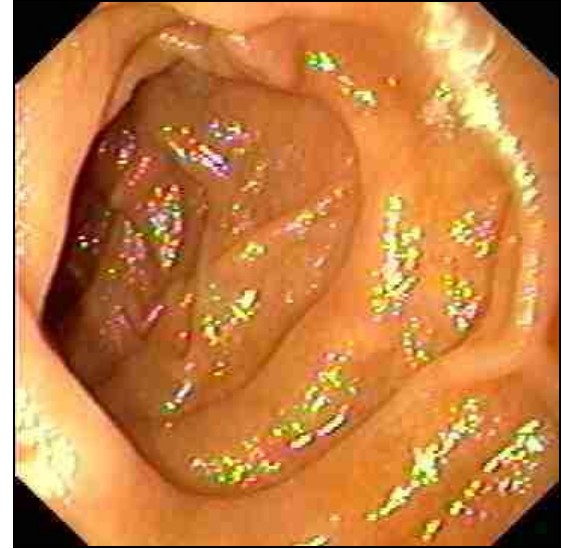
Who are the whey and wheat watchers?

- People with Celiac Disease
- People with Gluten Intolerance
- People with Wheat Allergy
- Parents of Autistic Children
- Food Faddists



Fast Facts on Celiac Disease

- Descriptions date to the first century
- Treatment identified in 1950
- Intestinal biopsy confirmed diagnosis of celiac disease in 1953
- Strong genetic link
- More frequently diagnosed in women and people of European descent
- Number of diagnoses for CD are increasing
- Average time of diagnosis is 10 years!



Clinical Diagnosis of Celiac Disease

- Highly variable
- 70% have diarrhea
- Failure to thrive in children
- + / - weight loss
- 80% with malaise/depression
- Monodeficiencies (Fe, D, K, Ca, Mg, Folate)
- Abnormal bone density
- Dermatitis
- Malignancies

Untreated Complications of CD

- Malnutrition
- Osteoporosis
- Infertility
- Intestinal problems
- Neurological problems
- Cancer

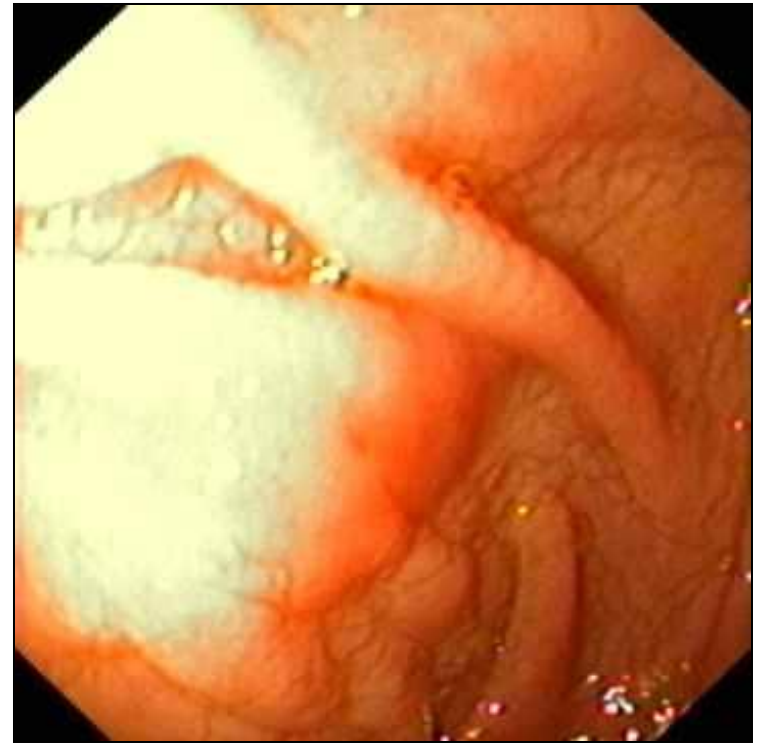
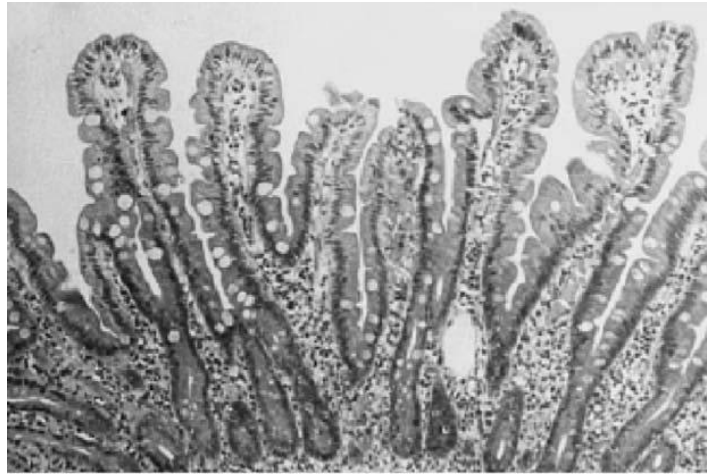


Figure 2 Normal versus CD small bowel biopsy. Top: Normal small bowel biopsy with finger-like villi. Bottom: CD small bowel biopsy with villous atrophy and hypertrophy of crypt.

Note. Reprinted with permission from Endocrine Reviews [Collin, P., Kamkinen, K., & Valimäki, M. (2002). Endocrinological disorder and celiac disease. *Endocrine Reviews*, 23(4), 464–483]. (Martin 2008



Diagnosis of Celiac Disease

Difficult!

- 1:650 is IGA deficient
- Serum IgG antigliadin and IgA endomysial antibody + **gluten ingestion (3-4 slices of bread for 6 weeks prior to testing)** = 70% confirmed
- *HLA DQ2 and HLA DQ8
genetic test

Coming soon!

Deaminated Gliadin
Peptide (99%)

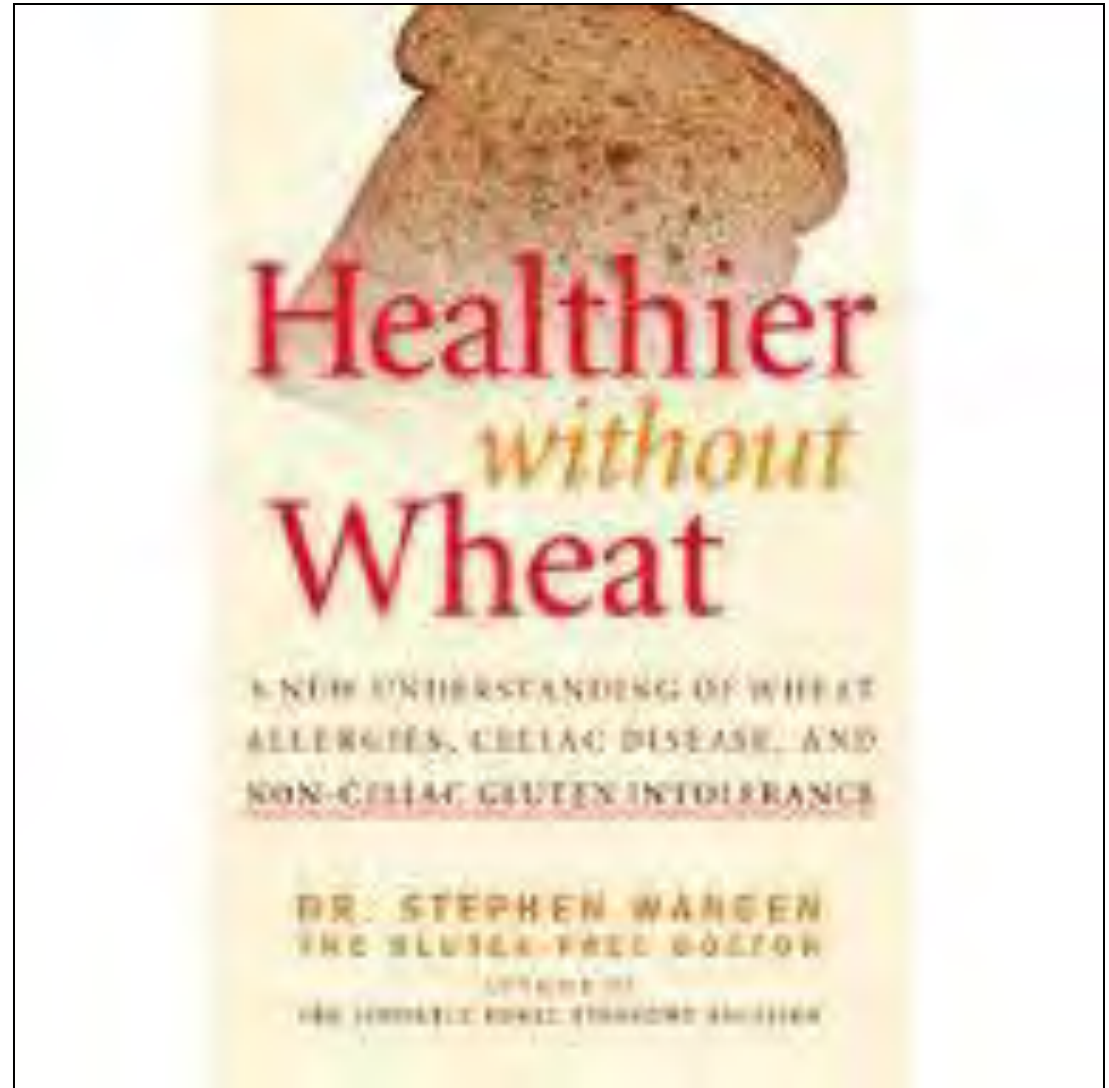
Newborn screening?



*HLA – Human Leukocyte Antigen on Chromosome 6

So Many Variations!

- Classical
- Atypical
- Silent
- Potential
- Latent



From *Up to Date*
March 2, 2010

Clinical Manifestations of Classic CD in Children

- Severe malabsorption- diarrhea, steatorrhea, lack of appetite, growth retardation, deficiencies in ADEK, iron, calcium, folic acid
- Positive serum antibodies
- Severe villous atrophy
- Typically between 9-24 months of age

-After age 3, loose stools, short stature, ferropenic anemia

-Untreated, celiac crisis develops (digestive bleeding, hypocalcemic tetany, death)



Clinical Manifestations of Classic CD in Adults

- Fatigue
- Abdominal pain
- Stomach distention
- Anemia
- Osteopenia
- Delayed menarche or irregular menstruation, infertility
- Constipation
- Depression



Treatment

Complete avoidance of gluten- this requires extensive patient education!

- Use of exotic grains such as quinoa, teff, sorghum, buckwheat, amaranth
- Check cosmetics, meds, & other sources for cross-contamination

Use of supplements (iron, folate, zinc, niacin, B12, calcium, phosphorus)

Immunosuppressive medications

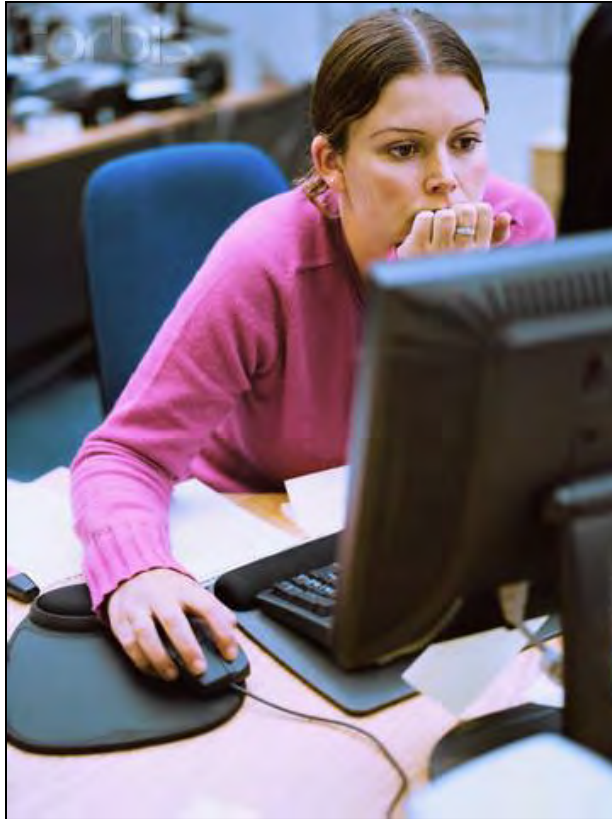
Pancreatic Enzymes?

Tx for GERD?

On the Horizon

- Enzyme supplements to break down the gluten peptides (AVL 300)
- Medicine to prevent the binding of gluten to HLA-DQ2
- Intestinal gluten peptide sequestrants

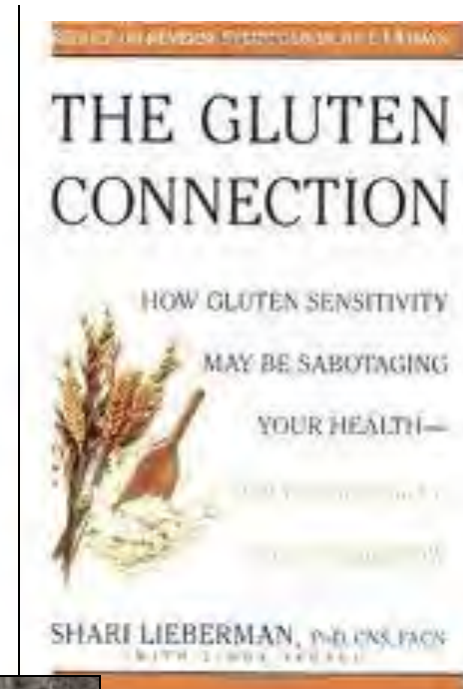
Useful Website



www.glutenfreemail.com

GLUTEN SENSITIVITY

- ✓ Affects up to 12% of the population
- ✓ Associated with other health issues
- ✓ Develops over time
- ✓ No definitive diagnostic test
- ✓ R/O with GF diet
- ✓ Tests used for evaluation include
 - Fecal fat
 - CBC
 - ESR
 - CRP
 - Vitamin Panel
 - Metabolic Panel



WHEAT ALLERGY

- ✓ IgE mediated
- ✓ Immediate allergic reaction
- ✓ Treated with GF diet



COFAR- Consortium of Food Allergy Research

- Label reading
- Handouts on major allergens
- Cross contact & how to prevent
- Preparing safe meals
- Restaurants, child care, schools, summer camps
- Nutritional issues
- How to introduce new foods

Labels-

- Wheat free is not equal to gluten free
- No standard definition (yet) for gluten free- likely to be released this year as less than 20 ppm per serving



Cross Contact

- Airborne, dermal
- Kitchen equipment
- Surfaces
- Manufacturer contamination



Best Practices

- Spokane School Best Practices to Prevent Anaphylaxis
- <http://www.spokaneschools.org/NutritionServices/>

Autistic Spectrum Disorder

- A neurobiological disorder.
- First described in 1943
- Diagnosed before 3 years
- Impaired social behaviors, communication, & repetitive, restrictive behaviors.



Treatment options for ASD are Limited.

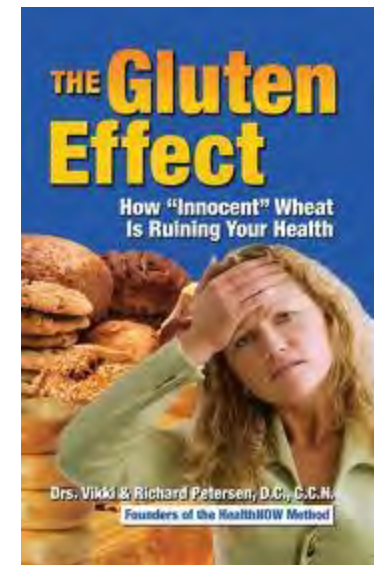
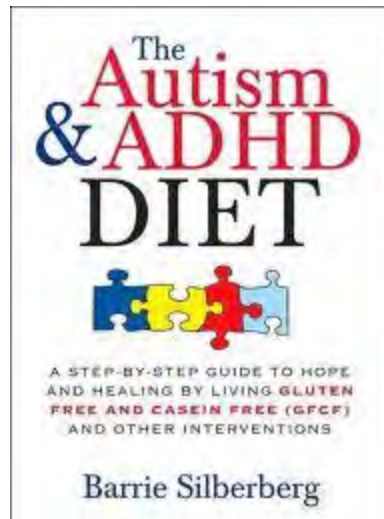
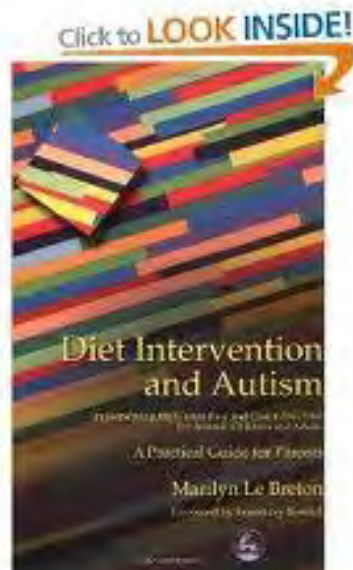
Characteristics

- Disturbance in the rate of appearance of physical social and language skills
- Abnormal responses to stimuli
- Speech & language are absent or delayed but specific thinking capabilities might be present
- Prevalence may be as high as 1/110 children.
- Affects boys 4:1



The Gut/Autism Link – Where did it all begin?

- Andrew Wakefield and intestinal permeability
- Dr. Bernard Rimland and the DAN diet
- Methyl mercury in vaccines



What is the Evidence for the GFCF Diet in Tx of Autism?

Researchers	Year	Sample	Results
Black et al	2002	N = 96 children with ASD N = 449 without	No evidence that children with ASD were more likely to have GI disorders before or after diagnosis
Molly	2003	N = 137 children w/ASD	No association between GI symptoms & developmental regression.
Elder et al	2006	N = 15 with ASD	No measurable effect of GFCF diet on ASD behavior was found
Hyman, Stewart, Smith	2010	N = 22 children with ASD	GFCF diet had no effect on behavioral or physiologic symptoms

What is the Evidence for the GFCF Diet in Tx of Autism?

Researchers	Year	Sample	Results
Knivsberg	1990		8 of 10 selected patients were reported to have behavioral improvements
Sponheim	1991	N = 4	Four selected children with autism placed on gluten free diet; behavior worsened
Horvath	1998	N=36	Autistic children given secretin improved behaviors; subsequent studies found no evidence of efficacy
Wakefield	1998	N=12	Identified a subgroup of autistic children with GI issues. Lancet withdrew paper in 2010 as biased

Consensus Statements on GI and ASD

– 23 Total

Buie, et al. Evaluation, diagnosis, and treatment of gastrointestinal disorders in individuals with ASDs: a consensus report. *Pediatrics*. 2010;125:S1-S18

Summary of the Statements -

The existence of GI disturbances specific to ASD has not been established, but individuals with ASD with GI symptoms should be evaluated the same as in non ASD populations.

Individuals with ASD and GI symptoms are at risk for problem behaviors making diagnosis and treatment complex.

Healthcare professionals and caregivers should be alerted to the nutritional problems of ASD and refer to a Registered Dietitian for follow up including growth monitoring, screening for food allergies, macro/micro nutrient deficiencies associated with diet restrictions (narrowed food selection or imposed diets).

Risks of “Autism Diets”

- Narrowing of food selection (<20 foods more likely to have deficiencies)
- Macro/Micronutrient deficiencies (Fe, Ca, Vitamins A, C, D)
- Expensive
- Toxicity from supplements
- Isolation
- Difficulty with compliance (school, social settings)



2009 Systematic Review

- Mulloy et al found no evidence in a thorough systematic review for efficacy of GFCF diet, gut/opioid theory.
- Current evidence suggests dietary interventions only when food allergy or intolerance is suspected.

The Search Continues

- 2009 Vanderbilt study finds gene (MET gene) implicated in autism AND GI problems
- Not found in all cases
- Not causative
- May be a subset of autistic children who also have GI problems



Food Behaviors of Austistic Children

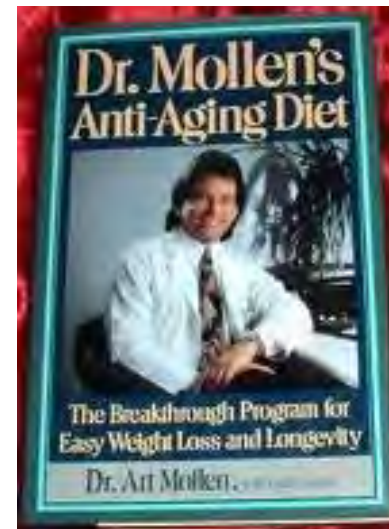
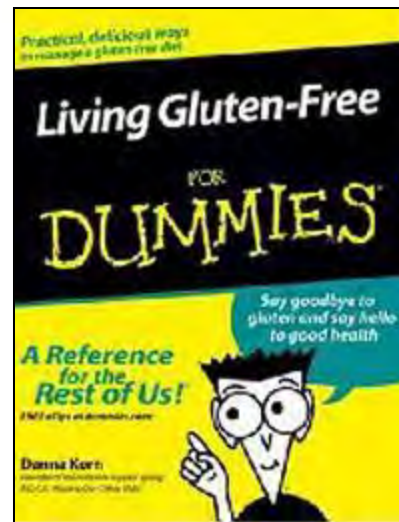
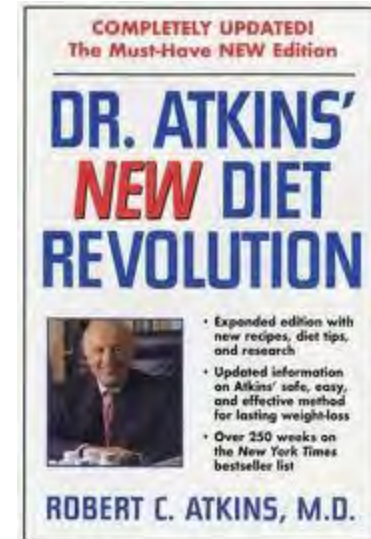
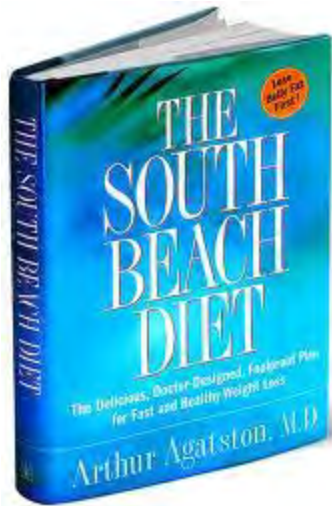
- Food selectivity limiting the variety of intake- type, texture, temperature, color, sensitivity to taste/smell/odor; food neophobia, anxiety
- Food refusal
- Disruptive mealtime behaviors
- As many as 50% of autistic children may also be placed on restrictive diets

Diet and Autism- A Reasonable Approach

- GI consult
- Diet hx and nutrition assessment
- Assess supplements
- Assess feeding development
- Extensive education on the diet
- Follow-up



Food Faddism



Questions?