

# Celiac Disease and Nutrition



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SUNMI  
**Naturopathic Health**  
*Healing through Nature*

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- **ND: Naturopathic Doctor**
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- **HBSoc: Honours Bachelor of Science, Sports Medicine**
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# What is Celiac Disease

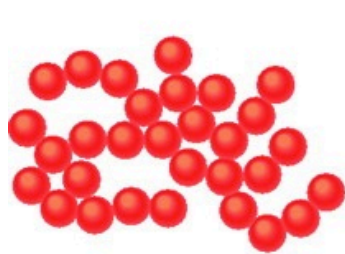
- **DEFINITION**

- Celiac disease is a chronic autoimmune disease characterized by malabsorption and diarrhea precipitated by ingestion of food products containing gluten.
- Diffuse damage in proximal small intestine villi → malabsorption of the nutrients

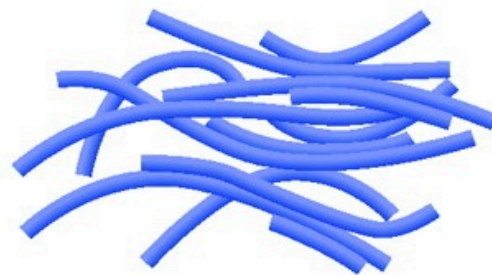
- **SYNONYMS**

- Gluten-sensitive enteropathy
- Celiac sprue
- Nontropical sprue

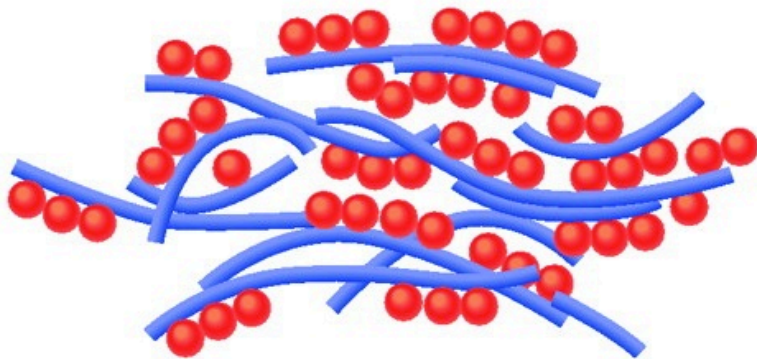
# Chemistry of Grain Proteins



Gliadin



Glutenin



Gluten (gliadin + glutenin)

prolamines

Rye

Secalins

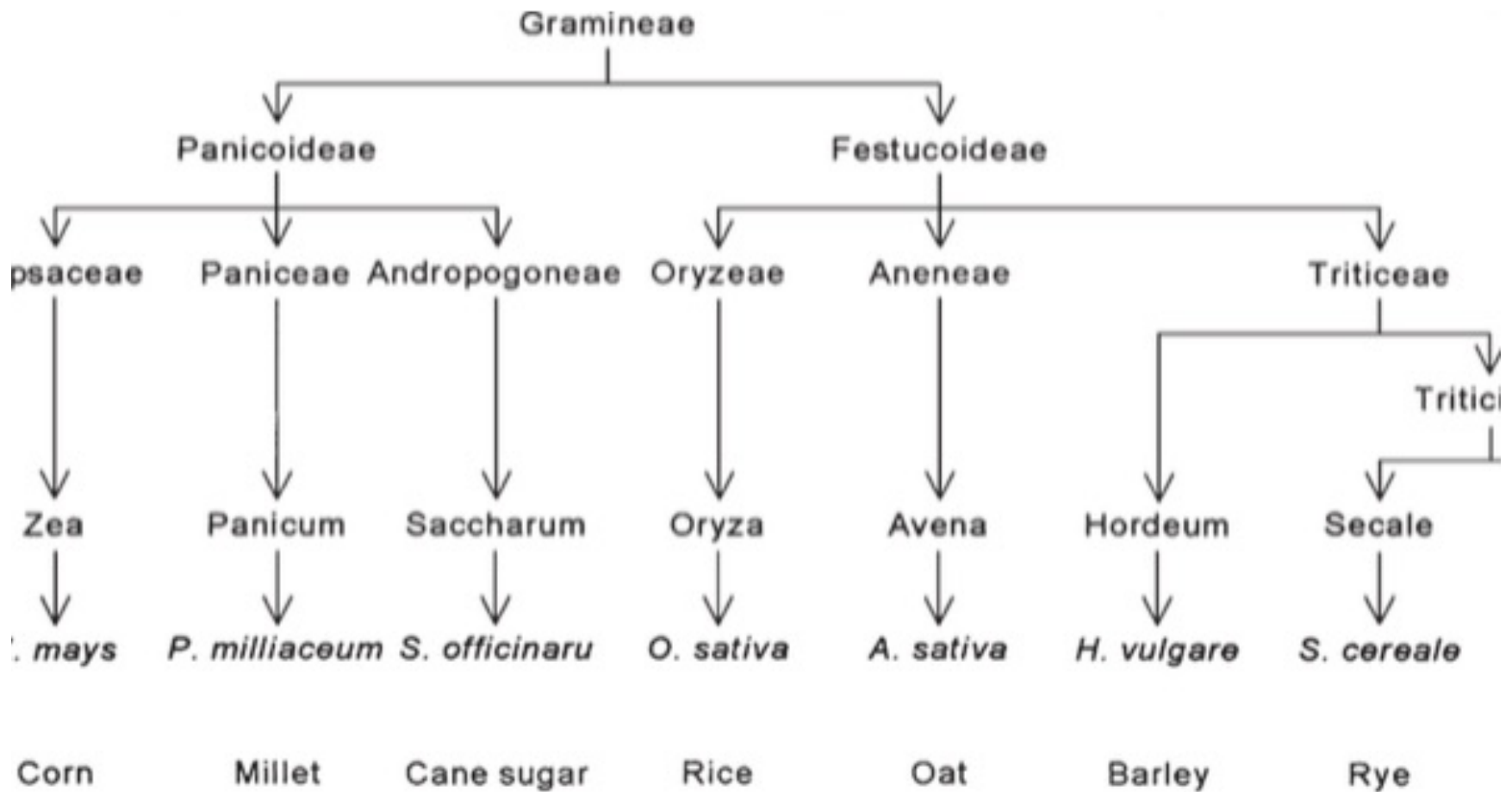
Barley

Hordeins

Oats

Avenins

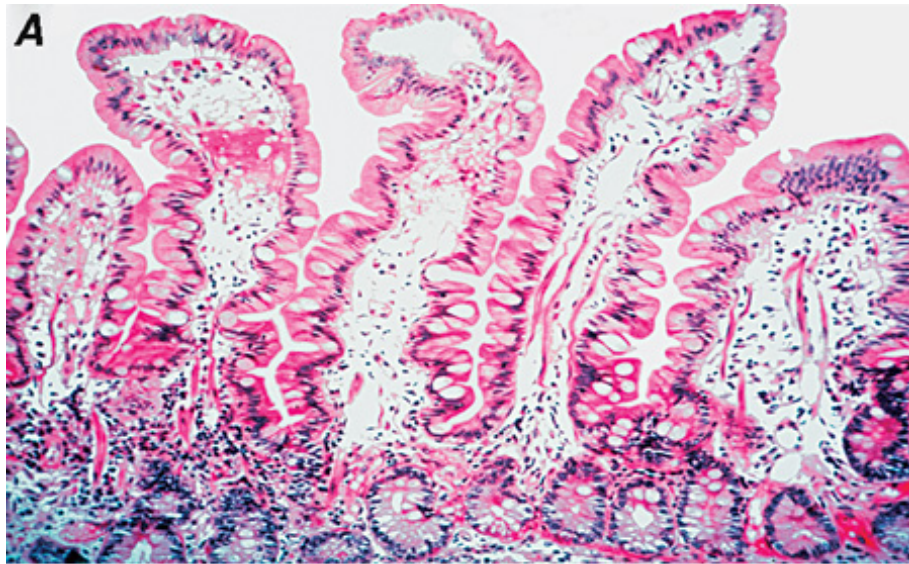
# Taxonomic relationship of major cereal grains



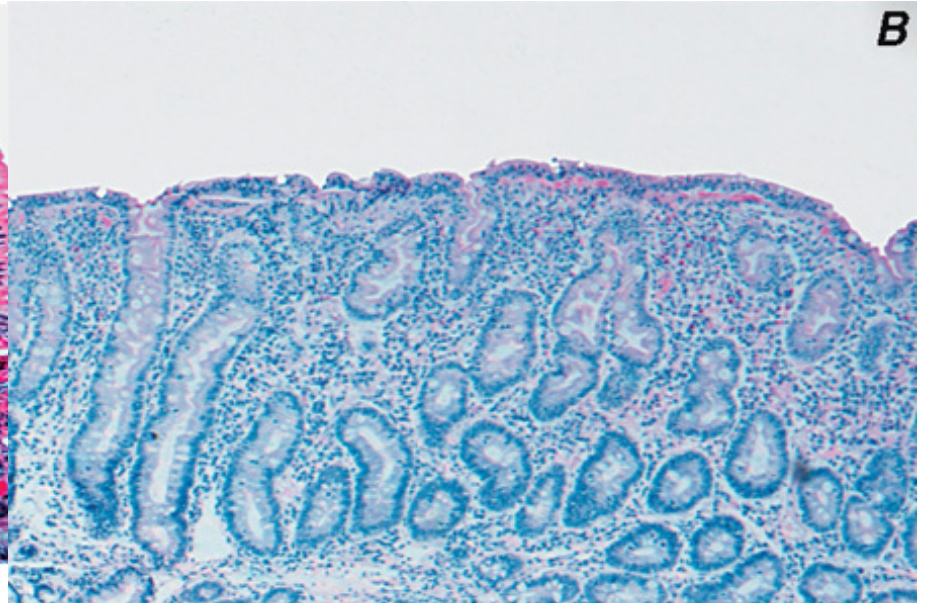
Reference: Text book of natural medicine, Pizzorno, p1281

# Diagnosis

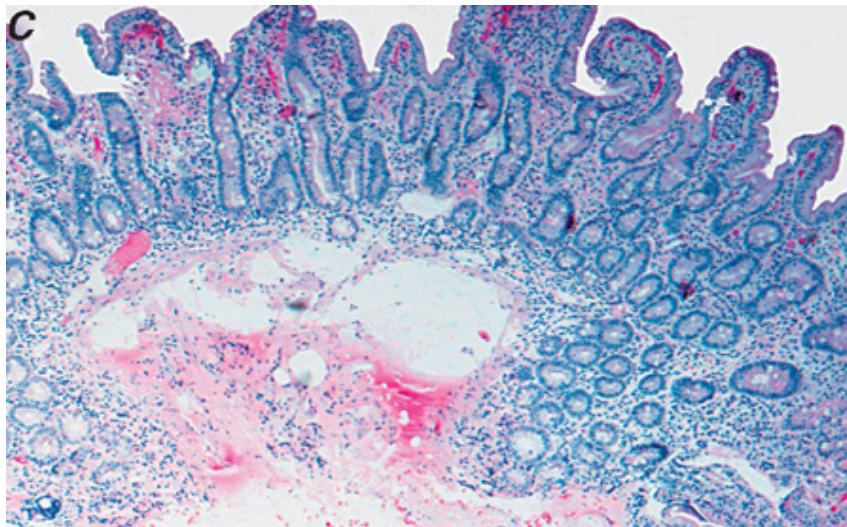
- Evidence of malabsorption: ↑ stool fat (>7g/day)
- Serologic test – screening & F/U
  - Antigliadin Ab, anti-endomysial Ab (EMA), anti-tTG (tissue transglutaminase) Ab
- Small bowel (jejunal) biopsy – confirmatory
  - Flattened villi, crypt hyperplasia, ↑ interaepithelial lymphocytes, etc.
- Gluten-free diet: clinical, serologic, histologic improvement
- Treatment
  - Gluten-free diet



Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: [www.accessmedicine.com](http://www.accessmedicine.com)  
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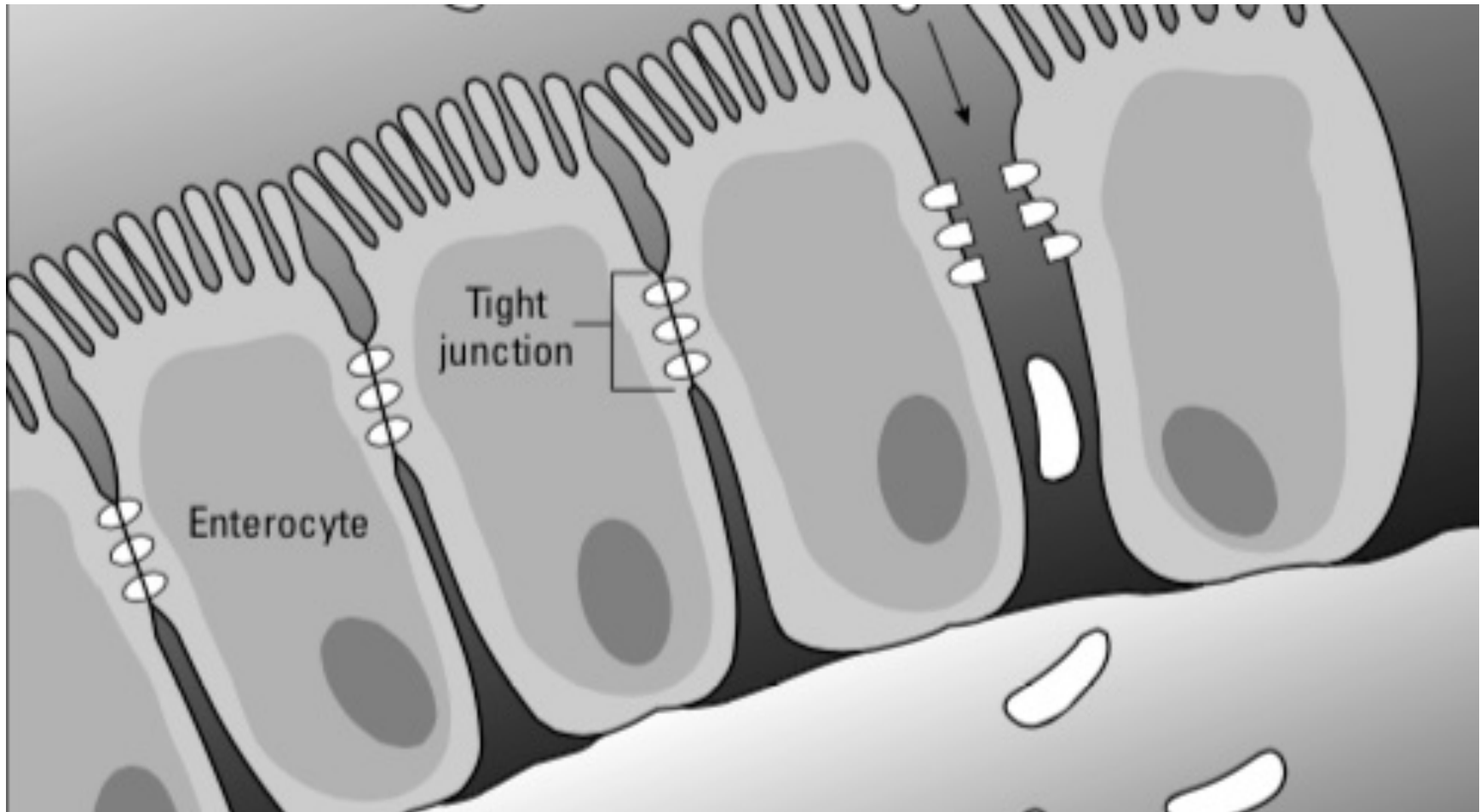
Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: [www.accessmedicine.com](http://www.accessmedicine.com)  
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- A. Normal individual.
- B. Untreated celiac sprue.
- C. Treated celiac sprue.

# Leaky gut syndrome

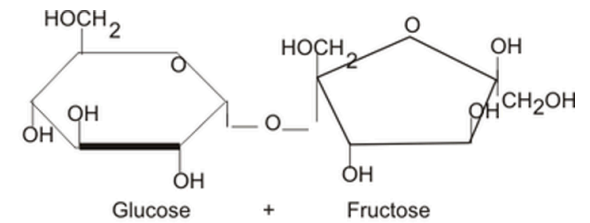


Increased intestinal permeability

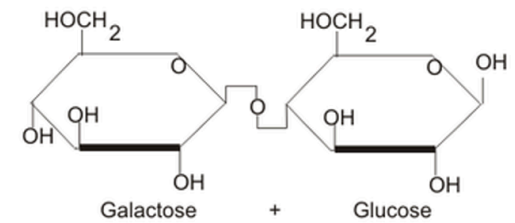


# Lactose intolerance

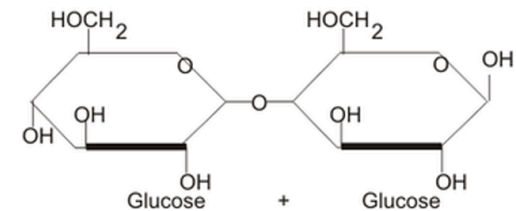
- Secondary lactase deficiency,
  - Consequence of changes in jejunal brush border enzymatic function
- Low-disaccharide diet
  - Lactose, sucrose, maltose, and isomaltose are the major disaccharides
    - Lactose: dairy
    - Sucrose: table sugar, honey, molasses, syrup, fruits juices, canned fruits, soda, ketchup, etc.
    - Maltose: malt, beer, cereal, pasta, potatoes, barley
    - Isomaltose: starch
  - Specific Carbohydrate diet
    - excludes all grains (including wheat, oats, barley, rye, corn, rice, millet, buckwheat, spelt, and triticale), milk and other lactose-containing foods, potatoes, soybeans and certain other beans, corn syrup, foods that contain sucrose, and a number of other foods



Sucrose



Lactose



Maltose

# Gluten free diet

- Avoid any and all foods that contains gluten
- Read all labels carefully.
- Watch for “**hidden**” sources of gluten
  - Hydrolyzed vegetable protein, textured vegetable protein, hydrolyzed plant protein
  - All derivatives of wheat, rye, oats, and barley, including malt, modified food starch, some soy sauces, grain vinegars, binders, fillers, inert substances, and “natural flavorings.”
  - Do not consume hot dogs, gravies, luncheon meat, beer, mustard, nondairy creamer, malt vinegar, curry powder, or seasonings.

“What do you eat?”



# Korean style







# Convenience matters! Use mason jar



# Kalbi Burger



- Ground organic beef 300g, onion ½
- Sauce: Gluten free soy sauce 6T, organic sugar 5T, sesame seed oil 3T, green onions 1/3 (green part), garlic 3 pieces, ground black pepper 1/3t







# Mini Kalbi burger



# Table barbecue



# SSam



Sauce: Sesame seed oil and sea salt

# Sriracha sauce



INGREDIENTS: Chili, Sugar, Salt, Garlic, Distilled Vinegar, Potassium Sorbate and Sodium Bisulfite as preservatives, and Xanthan Gum.

CONTAINS SULPHITE (SODIUM BISULFITE)

GRÉDIENTS: Piment, Sucre, Sel, Ail, Vinaigre Distillé, Sorbate De Potassium et Sulfite De Sodium comme agents de conservation, et Gomme De Xanthane.

CONTIENE SULPHITE (BISULFITE DE SODIUM)

INGREDIENTES: Chiles, Azúcar, Sal, Ajo, Vinagre, Sorbato De Potasio Y Bisulfito De Sodio como conservadores, Y Goma De Xantano.

CONTIENE SULFITO (BISULFITO DE SODIO)

# Grilled chicken/ Souvlaki



# Bibimbap



**Ingredients:** Cooked rice, carrots, zucchinis, bean sprouts, spinach, green leaves, eggs

**Sauce:** replace Korean chili pepper paste with Sriracha sauce and sesame oil

**Recipe:** <http://www.maangchi.com/recipe/bibimbap>



# Sushi / rice rolls



Ingredients: 3 cups of uncooked Short grain brown rice, vinegar 1/3 cup (80ml), organic sugar 3T, sea salt 1 ½ tea spoons, Nori seaweed sheets

Recipe: <http://www.justonecookbook.com/how-to/how-to-make-sushi-rice/>  
<http://www.justonecookbook.com/sushi-rolls/>



# Rice noodles



Chicken noodle soup

Ingredients: Rice noodles, shrimp or chicken, cilantro

Broth: Organic chicken stock, onions, celery, carrots, mushrooms, and any veggies you like



Pad Thai

Ingredients: Rice noodles, shrimp or chicken, garlic, mung bean sprouts

Sauce: 1 part gluten free soy sauce, 1 part organic sugar/honey, Sriracha, Ketchup

# Creamy avocado spinach pasta



- Ingredients: 10 oz brown rice pasta
- Sauce: 1 clove of garlic, 1 avocado, 1 cup fresh spinach, ½ cup pecans, ¼ cup basil, 1 tbsp fresh lemon juice, ¾ to 1 cup pasta, water, salt and pepper to taste

# Spring roll



Ingredients: Rice paper, vermicelli, carrots, cucumbers, peppers, mushrooms, avocado, shrimp, cilantro, mushrooms

Sauce: Apple butter + Almond butter + water

# Roasted root vegetables



Ingredients: Sweet potatoes, yams, cauliflower, broccoli, squash, pumpkin, carrots, beets

→ Season it with salt, pepper, and olive oil → bake it for 45~60 minutes.

# Watermelon Cake



Ingredients: Watermelon, Coconut cream, Toasted almonds, seasonal fruits

# Chick pea brownie



Ingredients: 1 can of Chick peas, 2 eggs, 1/3 cup raw cacao powder, 2/3 cup cocoa sugar, 1/2 cup of olive oil



# Green smoothie

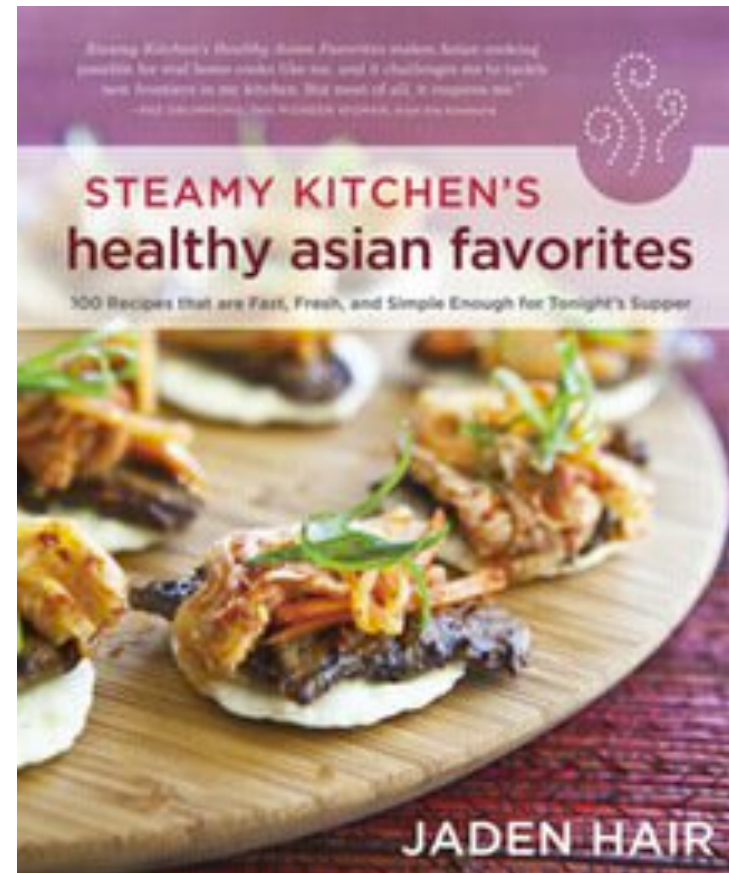


Add a scoop of protein power (Good brand: Vega, Sun Warrior, Progressive) and almond milk with your favorites fruits and veggies

# Blogs



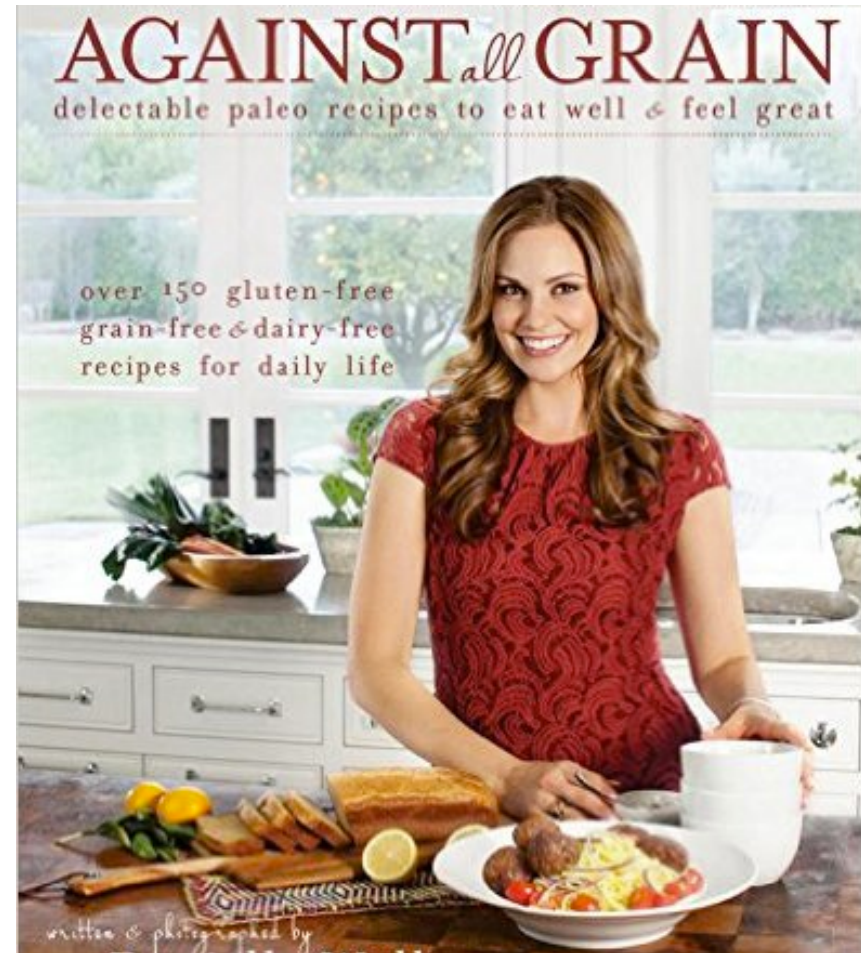
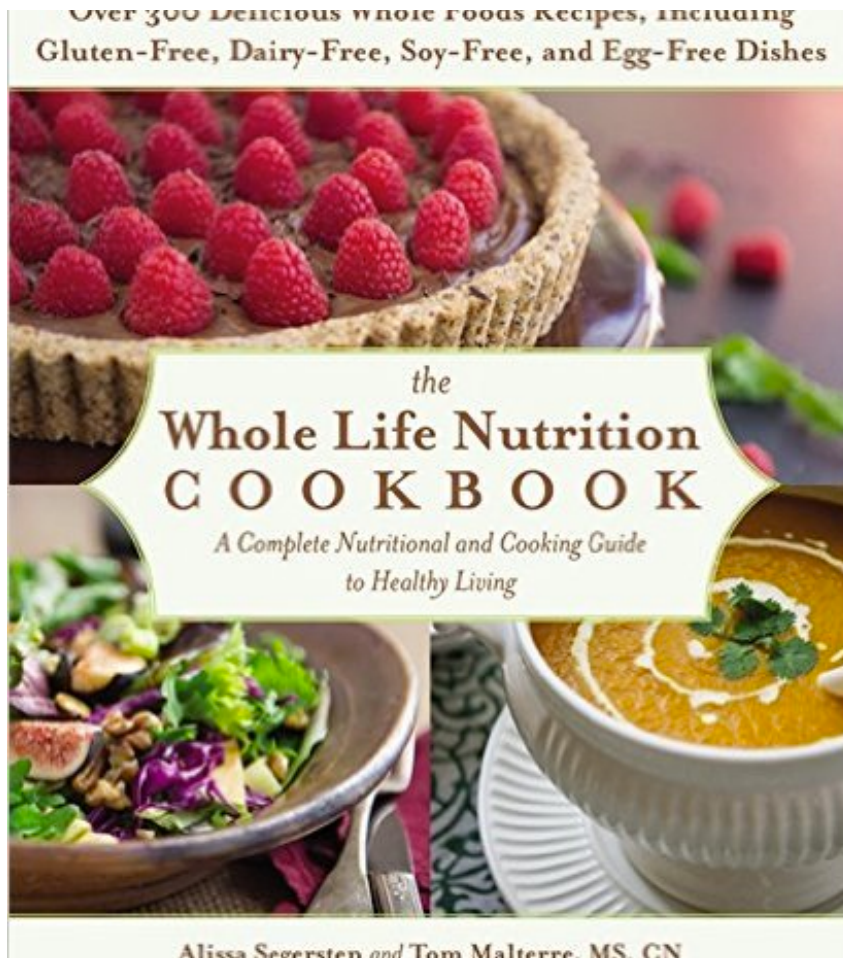
<http://www.maangchi.com/>



<http://steamykitchen.com/>

Korean recipe: replace Korean chili pepper sauce with Sriracha sauce. Sriracha sauce is gluten free.

# Cook Books



# Correct nutritional deficiency

- **Multi vitamin and mineral supplements**
  - To correct common deficiencies.
- **Folic acid, (Folate, B9)**
  - Plays a role in the synthesis of DNA and RNA
  - Involved in homocysteine and vitamin B12 metabolism, as well as the immune and neurological system.
  - Can cause anemia and atherosclerosis (“hardening of the arteries”)
  - Food sources: Green leafy vegetables, legumes, citrus fruits, beets, whole grains
- **Vitamin B6 (Pyridoxine)**
  - Important nutrient for carbohydrates metabolism, brain and nerve system health, and liver detoxification
  - Warning: >500mg/day can cause peripheral neuropathy
  - Food sources: Tuna, turkey, beef, chicken, salmon, sweet potato, sunflower seeds, spinach, banana
- **Vitamin B12 (cobalamine)**
  - Deficiency can lead to: Macrocytic anemia, neurological disorders, psychiatric symptoms (memory loss, depression, confusion, paranoia), glossitis, peripheral neuropathy
  - Food sources: Meat, poultry, fish, dairy and eggs

# Correct nutritional deficiency

- **Iron**

- Important component of hemoglobin
- Needed for synthesis of thyroid hormone and for conversion of tyrosin to dopa and dopamine
- Food sources: Poultry, fish, meat

- **Zinc**

- Skin, Immune
- Toxicity: Large doses may cause copper deficiency
- Food sources: beef, lamb, sesame seeds, pumpkin seeds, lentils, garbanzo beans, cashews, turkey, quinoa, shrimp, etc.

- **Copper**

- Immune, anemia, cancer, RA

# Correct nutritional deficiency

- **Vitamin A**
  - Plays a role in maintaining epithelial tissues of the skin, gastrointestinal tract, respiratory tract, and genitourinary tract
  - Need in visual function, spermatogenesis and immune function.
  - Caution during pregnancy and chronic smoker
  - Food sources: liver and fish liver oils, eggs, dairy, spinach, kale, cantaloupe, etc.
- **Vitamin E**
  - Antioxidant, prevent cell damage
  - Deficiency can lead to: anemia, nerve damage, muscle injury
  - Synthetic vitamin E: D,L-alpha-tocopherol acetate, synthetic forms cause cancer
  - Natural vitamin E: D-alpha-tocopherol
- **Selenium**
  - Antioxidant, Plays a role in converting thyroid hormone, enhances immune unction
  - Toxicity: Narrow margin of safety
  - Food sources: Tuna, shrimp, sardines, salmon, turkey, cod, chicken, lamb, scallops, beef

# Correct nutritional deficiency

- **Vitamin K**
  - Produced by intestinal gut flora, necessary for blood clotting, bone formation and repair
  - Food sources: leafy green vegetables, cheese, egg yolks
- **Magnesium**
  - Deficiency is common in people with celiac disease.
  - Used in: Constipation, arrhythmia, hypertension, asthma, migraine, diabetes, etc
  - Food sources: Nuts, whole grains, legumes, leafy green vegetables, dairy, meat, fish
- **Calcium**
  - Important for bone health and heart function
  - Toxicity: kidney stones, cardiovascular disease (depletes magnesium which is a cardioprotective agent)
- **Vitamin D3 (cholecalciferol)**
  - Stimulates absorption of calcium. People with celiac disease frequently have calcium deficiencies.
  - Food sources: Cod liver oil, fish (salmon, mackerel, sardines)
- **Pancreatic enzymes**
  - Additional digestive enzymes may be needed to aid in breakdown and absorption of foods
- the world's healthiest foods.com [www.whfoods.com](http://www.whfoods.com)

# Preventing celiac disease

- Timing of introduction of gluten into the infant diet is associated with the appearance of celiac disease in children at risk.
- Children initially exposed to gluten in the first 3 mo of life have a fivefold increased risk.
- Breastfeeding



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

**THANK YOU!**