

THE GLUTEN-FREE NUTRITION GUIDE

OPTIMIZING THE GLUTEN-FREE DIET

By Cynthia Kupper / Executive Director



Factors affecting nutrition

- Economic status
- Disabilities
- Immediate social situation
 - Living alone/isolation
 - Number living in home
- Urban/rural living
- Depression
- Dependency
- Mental health
- Oral health
- Diet related diseases or conditions
- Multiple medication needs
- Minority status
- Age



GLUTEN
INTOLERANCE
GROUP

Potential problems for persons following a GF Diet:

- ↓ Fiber, carbohydrate
- ↑ Fat intake
- ↓ Iron
- ↓ Folate
- ↓ Niacin
- ↓ Vitamin B-12
- ↓ Calcium
- ↓ Phosphorus
- ↓ Zinc
- ↓ Vitamin D
- ↓ Quality of Life
 - Cost of GF living
 - Availability of foods
 - Social inconveniences
 - Continued GI symptoms
 - Possible weight changes – gain vs. loss

Nutritional Adequacy of Gluten-Free Diet

Nutritional deficiencies of a Gluten-Free Diet	Improvement after starting Gluten Free Diet	Inadequate intake after starting gluten free diet
Serum Hemoglobin	x	
Iron	x	
Zinc	X*	
Fat		x
Carbohydrate		x
Fiber		x
Niacin		x
B12		x
Calcium		x
Phosphorus		x
Zinc		X*

* Zinc levels has been shown to improve after starting a Gluten-Free Diet (GFD) as a result of intestinal healing and improved absorption, but the average daily intake in a GFD is inadequate to meet RDA for zinc.

American Dietetic Association, Evidence Based Library,
http://www.adaevidencelibrary.com/template.cfm?template=guide_summary&key=2102, accessed on 3/23/2011



Nutritional Adequacy of GFD

- If a gluten-free diet does not provide an adequate supply of the nutrients at risk (iron, folate, niacin, vitamin B₁₂, calcium, phosphorus and zinc), it may be wise for people with celiac disease to consume a daily gluten-free age- and sex-specific multivitamin and mineral supplement.
- Whole grain carbohydrates in the form of brown rice, wild rice, buckwheat, quinoa, amaranth, millet, sorghum, teff can add healthy carbohydrates as well as fiber to a GFD.

American Dietetic Association, Evidence Based Library,
http://www.adaevidencelibrary.com/template.cfm?template=guide_summary&key=2102, accessed on
3/23/2011



Potentially problematic nutrients for mature adults:

- ↓ Protein intake - leads to
 - muscle wasting
 - weakened immune status
 - delayed wound healing
- High saturated fats and trans-fats intake – leads to
 - ↑ risk for chronic heart disease
- ↓ Vitamin D
 - Lack of sun exposure
 - Some meds interfere w/ metabolism
- ↓ Fiber
 - Regularity problems
 - Risk of GI conditions

Potentially problematic nutrients for mature adults:

- ↓ Vitamin B12 absorption:
 - decreased mental function
 - personality change
 - loss of physical coordination
 - May be diagnosed with a dementia condition instead of low B12
- Low dietary intake
 - Vit E
 - Folate
 - Calcium
 - Magnesium
 - Zinc
 - Iron



GLUTEN
INTOLERANCE
GROUP

Optimizing nutritional adequacy of the gluten-free diet

<http://fnic.nal.usda.gov>



You might be Niacin deficient IF...

- In elderly – common deficiency
- Bad breath
- Canker sores
- Confusion, memory impairment
- Dermatitis, skin eruptions
- Diarrhea
- Emotional instability, irritability, depression
- Loss of appetite
- Muscle weakness
- Nausea
- Inflammation
- Fatigue



GLUTEN
INTOLERANCE
GROUP

About Niacin (Vit B-3)

- Reduces cholesterol
- Important in DNA repair
- Role in producing steroid hormones
- Positive role in reversing atherosclerosis
- Possible role in reducing Alzheimer's Disease

RDA

8 mg - Kids 4-8

12 mg - Kids 9-13

14 mg – Women 14+

16 mg – Men 14+



GLUTEN
INTOLERANCE
GROUP

Finding Niacin (Vit B-3)

RDA

8 mg - Kids 4-8

12 mg - Kids 9-13

14 mg – Women 14+

16 mg – Men 14+

- Animal products
 - Liver, heart, kidney
 - Chicken, beef
 - Fish, tuna, salmon
 - Milk
 - Eggs
- Nuts and Legumes
- Whole Grains
- Fruits and vegetables
 - Asparagus , Avocados
 - Broccoli, Carrots
 - Dates, Leafy vegetables,
 - Mushrooms, Tomatoes
 - Sweet potatoes



GLUTEN
INTOLERANCE
GROUP

You might be Folate deficient IF...

- Anemia
- Apathy
- Diarrhea
- Fatigue, insomnia
- Headaches
- Loss of appetite
- Neural tube defects in fetus
- Paranoia
- Shortness of breath
- Weakness

About Folate (Vit B-9)

- Important in preventing birth defects
- Allergic asthma
- Bone health
- Helps make new cells, including red blood cells to prevent folate-related anemia
- Important in DNA function (may impact cancer risk)

RDA:

200 mcg - Kids 4-8

300 mcg - Kids 9-13

400 mcg - Women 14+

400 mcg - Men 14+



GLUTEN
INTOLERANCE
GROUP

Finding Folate (Vit B-9)

RDA:

200 mcg - Kids 4-8

300 mcg - Kids 9-13

400 mcg - Women 14+

400 mcg - Men 14+

- Leafy vegetables (spinach, asparagus, turnip greens, romaine)
- Other vegetables (beets, broccoli, corn, tomato or vegetable juices, Brussels sprouts, bok choy)
- Dried or fresh beans and peas
- Fortified grain products (cereals, flour blends), sunflower seeds
- Fruits (orange, P/A and grapefruit juices, cantaloupe, honeydew melon, banana, raspberry, grapefruit, strawberry)
- Liver



GLUTEN
INTOLERANCE
GROUP

You might be B12 deficient IF...

- Anemia
- Constipation
- Depression, irritability, mental disturbances, moodiness
- Dizziness
- Fatigue
- Intestinal disturbances, low stomach acid
- Headaches
- Loss of vibration sensation
- Mouth lesions
- Numbness
- Spinal cord degeneration

About Cobalamin (Vit B-12)

RDA:

1.0 mcg - Kids 4-8

1.8 mcg - Kids 9-13

2.4 mcg - Women 14+

2.4 mcg - Men 14+

- Role in blood formation
- B-12 helps to regulate the active folic acid
- B-12 deficiency can lead to pernicious anemia
- Key role in normal function of brain and nervous system
- Role in normal cell activity, DNA, fatty acid synthesis and energy production
- Deficiencies can increase fatigue, depression, poor memory, mania, psychosis



GLUTEN
INTOLERANCE
GROUP

Finding (Vit B-12)

RDA:

1.0 mcg - Kids 4-8

1.8 mcg - Kids 9-13

2.4 mcg - Women 14+

2.4 mcg - Men 14+

In foods that come from animals

- Fish, Shellfish
- Meat (especially liver)
- Poultry, Eggs
- Milk, Milk products



GLUTEN
INTOLERANCE
GROUP

You might be Calcium deficient IF...

- Brittle nails
- Cramps
- Delusions, depression, insomnia, irritability
- Osteoporosis
- Palpitations
- Peridontal disease
- Rickets
- Tooth decay



GLUTEN
INTOLERANCE
GROUP

About Calcium

- Vitamin D is needed to absorb calcium
- Electrical conduction system in the heart
- Deficiency can lead to poor blood clotting
- Major role in bone health - strength and density
- Role in muscle contraction and neurotransmitter release
- Excess can lead to impaired kidney function and decreased absorption of other minerals

RDA:

1000 mg - Kids 4-8

1300 mg - Kids 9-14

1000 mg - Women 14-50

1200 mg - Women 50+

1000 mg - Men 14-50

1200 mg - Men 50+



**GLUTEN
INTOLERANCE
GROUP**

Finding Calcium

- Dairy foods (milk , yogurt, and cheese)
- Seaweeds (kelp, wakame, and hijiki)
- Nuts and seeds (almonds and sesame)
- Blackstrap molasses; Beans
- Fruits (oranges, figs)

RDA:

1000 mg - Kids 4-8

1300 mg - Kids 9-14

1000 mg - Women 14-50

1200 mg - Women 50+

1000 mg - Men 14-50

1200 mg – Men 50+

- Whole GF grains (quinoa, amaranth)
- Vegetables (collard greens, kale, okra, rutabaga, broccoli, dandelion greens)
- Fortified products (OJ and soy milk)



**GLUTEN
INTOLERANCE
GROUP**

You might be Vit. D deficient IF...

- Elderly woman
- Burning sensation in mouth
- Diarrhea
- Insomnia
- Myopia
- Nervousness
- Osteomalacia, osteoporosis, rickets
- Scalp sweating

About Vitamin D

RDA*:

400 IU - All 8-70

600 IU - All 71+

***It is anticipated that the FDA will raise these values in the near future.**

- Important in bone health
- Essential for promoting calcium absorption
- Maintaining proper calcium/phosphorus levels
- Role in neuromuscular and immune functions
- Role in reducing inflammation, cancer risk and other conditions



**GLUTEN
INTOLERANCE
GROUP**

Finding Vitamin D

- Very few foods naturally contain
- vitamin D
 - flesh of fish (such as salmon, tuna, and mackerel); fish liver oils
 - beef liver, cheese, and egg yolks
 - Some mushrooms
- Fortified Foods
 - Milk, yogurt , margarine, ready-to-eat breakfast cereals, cereal flours
 - Some OJ, Calcium-fortified fruit juices and drinks
- Sunshine: Season, location, time of day, cloud cover, smog, skin melanin content, and sunscreen impact absorption

RDA*:

400 IU - All 8-70

600 IU - All 71+

***It is anticipated that the FDA will raise these values in the near future.**



**GLUTEN
INTOLERANCE
GROUP**

About Phosphorus

RDA:

500 mg - Kids 4-8

1250 mg - Kids 9-18

700 mg - Adults 19-70+

- Important in energy production and storage
- Important in transmission of genetic information
- Major structural component of bone and cell membranes
- Activation of enzymes, hormones and cell-signaling
- Helps maintain normal acid-base balance (pH)
- Binds to hemoglobin in red blood cells and affects oxygen delivery to the tissues of the body



GLUTEN
INTOLERANCE
GROUP

Finding Phosphorus

RDA:

500 mg - Kids 4-8

1250 mg - Kids 9-18

700 mg - Adults 19-70+

- Meats: organ meats (liver, brains, heart, kidney, sweetbreads) rabbit, poultry, beef, eggs/yolk, lamb, seafood
- Nuts and seeds
- Vegetables: chickpeas, garlic, lentils, popcorn, soybeans
- Dairy: cheeses
- Grains: wild rice, buckwheat, millet, oats, oatmeal, brown rice, rice bran
- Other sources: chocolate, kelp, yeast, bone meal.



GLUTEN
INTOLERANCE
GROUP

You might be Iron deficient IF...

- Anemia
- Brittle nails
- Confusion, depression
- Constipation
- Dizziness
- Fatigue
- Headaches
- Inflamed tongue
- Mouth lesions

About Iron

- Carries oxygen in the blood
- Prevents iron-def. anemia
- Not many GF products are
- fortified
- Some GF grains are good sources of iron
- Take with Vit. C to improve uptake of non-heme (vegetable) sources of iron
- Do not take with calcium-rich foods

RDA:

10 mg – Kids 4-8

8 mg – Kids 9-13

15 mg – Female 14-18

18 mg Female 19-50

8 mg – Female 50+

11 mg – Male 14-18

8 mg – Male 19 – 70+



**GLUTEN
INTOLERANCE
GROUP**

Finding Iron

- Heme iron
 - red meats, fish, and poultry
- Non-heme iron
 - lentils and beans
 - Molasses
 - Tofu
 - Dark green vegetables
 - Enriched or Fortified cereal/grain products
 - Tef

RDA:

10 mg – Kids 4-8

8 mg – Kids 9-13

15 mg – Female 14-18

18 mg Female 19-50

8 mg – Female 50+

11 mg – Male 14-18

8 mg – Male 19 – 70+



**GLUTEN
INTOLERANCE
GROUP**

You might be Zinc deficient IF...

Zinc is the #1 nutritional deficiency in U.S. children (30-70%)

- Acne, eczema
- Amnesia
- Apathy, depression, irritability, memory impairment, paranoia
- Brittle nails, white spots on nails
- Delayed sexual maturity, growth impairment
- Diarrhea
- Fatigue, lethargy
- Hair loss
- High cholesterol levels
- Immune impairment
- Impotence, male infertility
- Loss of appetite, loss of sense of taste, low stomach acid
- Night blindness
- Wound healing impairment

About Zinc

- Taste acuity
- Bone mineralization
- Essential for cell division, synthesis of DNA
- Blood clotting, cognitive functions, fetal growth
- Role in activity of enzymes assoc. with protein, carbs, fat, and alcohol metabolism
- Critical to tissue growth, wound healing, connective tissue growth and maintenance
- Immune system function, proper thyroid function, sperm production
- Prostaglandin production for smooth muscle contractions, Blood Pressure, inflammation and body temp.

RDA:

5 mg – Kids 4-8

8 mg – Kids 9-13

9 mg – Female 14-18

8 mg – Female 19-70+

11 mg – Male 14-70+



**GLUTEN
INTOLERANCE
GROUP**

Finding Zinc

- Oysters, crab, seafood
- Beef, liver , poultry
- Nuts and seeds, peanuts and peanut butter

- Legumes
- Whole grains
- Tofu, Milk

RDA:

5 mg – Kids 4-8

8 mg – Kids 9-13

9 mg – Female 14-18

8 mg – Female 19-70+

11 mg – Male 14-70+



GLUTEN
INTOLERANCE
GROUP

About Magnesium

- Muscle control, and relaxation
- Assisting DNA and other enzymes
- that act as genetic building blocks
- Distribution and creation of human energy
- The production of protein
- Magnesium is essential for calcium to work properly in the body

RDA:

240 mg - Kids 8-13
360 mg – Female 14-18
310 mg Female 19-30
320 mg Female 30-50+
410 mg – Male 14-18
400 mg – Male 19-30
420 mg Male 30-50+



**GLUTEN
INTOLERANCE
GROUP**

Finding Magnesium

- Dark green, leafy vegetables such
- as spinach and even broccoli
- Fruits or vegetables (such as
- bananas, dried apricots, and avocados)
- Nuts (such as almonds and cashews)
- Peas and beans (legumes), seeds
- Soy products (such as soy flour and tofu)
- Whole grains (such as brown rice and millet)

RDA:

240 mg - Kids 8-13
360 mg – Female 14-18
310 mg Female 19-30
320 mg Female 30-50+
410 mg – Male 14-18
400 mg – Male 19-30
420 mg Male 30-50+



GLUTEN
INTOLERANCE
GROUP

About Fiber

- Proper bowel function
- Important for a healthy immune system
- May reduce risk of cancers
- May help with blood sugar control in diabetes
- Reduce the risk of coronary heart disease (BP, Chol, Lipids)
- May help with weight control (Increased satiety, Decreased intake)
- Grains with folate helpful in fetal development during pregnancy

RDA:

25 g – Kids 4-8

26 g – Female 9-18

25 g – Female 19-50

21 g – Female 50+

31 g – Male 9-13

38 g – Male 14-50

30 g – Male 50+



**GLUTEN
INTOLERANCE
GROUP**

Finding Fiber

- Raw Fruits
- Raw Vegetables
- Whole GF Grains
- Nuts and Seeds
- Fiber supplements and fiber-added foods/beverages

RDA:

25 g – Kids 4-8

26 g – Female 9-18

25 g – Female 19-50

21 g – Female 50+

31 g – Male 9-13

38 g – Male 14-50

30 g – Male 50+



GLUTEN
INTOLERANCE
GROUP

GF Grains – High in Fiber & Nutrients

- Tef: calcium, magnesium, iron, zinc, and B vitamins
- Quinoa: potassium, zinc, phosphorous, iron, B-vits, magnesium, and calcium
- Amaranth: calcium and iron
- Buckwheat: magnesium, phosphorous, potassium, B6 vits, iron, niacin, thiamin and zinc
- Indian rice grass (Montina): phosphorous, iron, and B-vitamins
- Chia, flax: omega 3 fatty acids
- Sorghum (milo): phosphorous, potassium, B vitamins, iron

Weight Management

- GF is not calorie-free
 - most times GF is more caloric dense than wheat-based options
- Read labels for total calories and serving size
- Choose nutrient-dense foods
 - Watch fat, sugar and fiber in foods
- Choose GF specialty foods carefully
- Use more fresh fruits and vegetables and less highly refined, processed foods
- Exercise

Easy, low cost healthy gluten-free meals



GLUTEN
INTOLERANCE
GROUP

Tips for easy, healthy meals

- Eat colors - Eat fresh - Eat naturally GF
- Consume whole or enriched gluten-free grains and products
- Eat minimally processed foods
- Choose products to make cooking easy
 - frozen, canned, fresh
- Cook in volume and freeze
 - Cooking parties, fresh and ready meals
- Use GF specialty foods in moderation
- Exercise – WATER – Rest – Reduce stress
- Add nutritional supplement if necessary



GLUTEN
INTOLERANCE
GROUP

Meals with a punch

- Yogurt with fresh fruit and granola
- Whole grain pancakes or waffle breakfast sandwich
- GF oatmeal, grits with dried fruit
- Semi-homemade soups with beans and grains
- Cornbread or corn cakes vs. GF breads
- Lean meat stews
- Steamed vegetables and salads with protein
- Sweet potatoes/yams vs white potatoes



GLUTEN
INTOLERANCE
GROUP

Gluten Free Super Foods

Kefir

People with Gluten Intolerance and/or Celiac Disease commonly experience issues with their digestive tract. The pro-biotic cultures in kefir can be beneficial to your digestive health. Kefir possesses a high content of antioxidants and B-vitamins which can help heal the tissues in the gut. Dairy-free alternatives are available, such as coconut milk kefir and soy milk kefir. It makes a wonderful base for a smoothie. As it contains yeasts, kefir can be used to make a sourdough bread. It is also useful as a buttermilk substitute in baking.



GLUTEN
INTOLERANCE
GROUP

Gluten Free Super Foods

Flaxseed

This popular seed is high in omega-3 fatty acids. Studies have shown it has anti-inflammatory properties and has a mild estrogenic effect that may benefit people with chronic inflammation, skin and cardiovascular issues. It is rich in lignans that help soothe the intestinal tracts. The fiber found in flax seeds can help repair damage to the small intestine.



GLUTEN
INTOLERANCE
GROUP

Gluten Free Super Foods

Coconut

Coconuts provide essential medium chain fatty acids that protect and heal the body. Its meat is a densely packed source of fats and oils that have been scientifically studied for their anti-inflammatory and anti-pathogenic properties. Moreover, coconut meal can be ground into a flour that is excellent for gluten-free baking and cooking. The saturated oils are plant based and do not have the same un-healthy effects that animal based saturated fats do.

Gluten-Free Nutrition Guide

For more information about nutritional needs of persons with gluten intolerances visit: www.gluten.net

This information provided by Cynthia Kupper, RD, Executive Director of GIG with the support of Bastyr University Nutrition and Dietetic Interns

