Nutrients of Concern for Vegetarians

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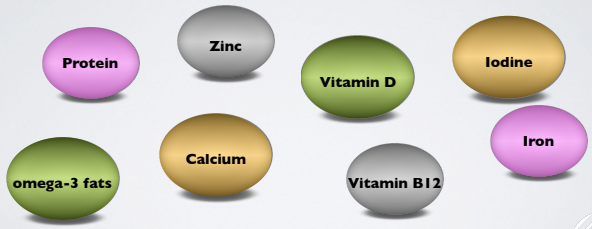
GNYC HEALTH MINISTRIES

Nutrients to Consider



Protein

- Choose adequate servings at each meal according to needs
- In general, 1-2 servings of healthy proteins per meal
  - 1 serving = 7 grams of protein (14 grams per meal)
- Obtain from a variety of plant sources

Protein

Beans & Nuts	Vegetables	Whole Grains
Beans, legumes 1/2 cup = 8g Soy, tofu 1/2 cup = 8 g Hummus 1/3 cup = 4 g Nuts 1 oz = 4-6 g Nut butters 1Tbsp = 4 g Seeds 1 oz = 4-7 g	Collards 1 cup = 5 g Spinach 1 cup = 5 g Asparagus 1 cup = 4 g Broccoli 1 cup = 3 g Kale 1 cup = 2.5 g	Kamut 1/2 cup = 6 g Oats 1/2 cup dry = 5 g Quinoa 1/2 cup = 4 g Whole wheat bread 4 g Brown rice 1/3 cup = 2 g

Calcium (Ca)

- 99% found in bone + 1% in muscle + 0.2% in blood
- If blood levels drop, body will compensate
  - Increase Ca absorption from food
  - Increase Ca reabsorption via kidney
  - Remove Ca from bone stores

Calcium

- Recommendation
  - Most adults should get 1000 mg daily
  - Women over 50 and men over 70 should get 1200 mg daily
- Oxalates inhibit absorption of calcium
  - Beet greens, Swiss chard, rhubarb, spinach

Ca & Other Nutrients

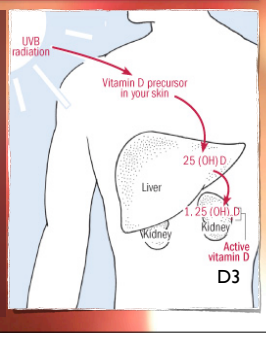
- Vitamin D: necessary to absorb Ca from food
- Protein: not conclusive that it effects Ca absorption
- Phosphorus: not conclusive that it decreases Ca absorption
- Caffeine: short-term increase in Ca loss
- Sodium: increases Ca loss
- Potassium: increases Ca retention

Calcium

300 mg	200 mg	100 mg	50-75 mg
Fortified soymilk, almond milk, other alternatives, 8 oz Fortified orange juice, 8 oz Collard greens, cooked, 1 cup	Turnip greens, cooked, 1 cup Mustard greens, cooked, 1 cup Tofu, calcium-set, ½ cup Calcium-fortified breakfast cereal, 1 oz Blackstrap molasses, 1 Tbsp	Kale, cooked, 1 cup Bok choy, cooked, 1 cup Edamame, cooked, 1 cup Soynuts, ½ cup Sesame seeds, 1 Tbsp Dried figs, 5	Broccoli, cooked, 1 cup Almond butter or tahini, 2 Tbsp Tempeh, ½ cup Navy, great northern, garbanzo, pinto, black beans, cooked, 1 cup Almonds, 2 Tbsp

Vitamin D

- Steroid hormones
- Two types
  - D2 - ergocalciferol
    - Found in plants, fungi, molds, snails, worms
  - D3 - cholecalciferol
    - Formed when UVB radiation from sun activates 7-Dehydrocholesterol in skin



Vitamin D Functions

- Bone and muscle health: maintains normal levels of calcium and phosphorus by helping absorption of calcium
- Regulates immune function
- Regulates cell growth & development
- Regulates blood pressure & insulin

Vitamin D

- Sun exposure is most important
  - Affected by season, latitude, time of day, cloud cover, smog, sunscreens, skin color, etc.
- Recommendation: 600 mg daily for everyone
- Vegans - may be more difficult to meet vitamin D requirements
- Have your physician check your levels

Vitamin D

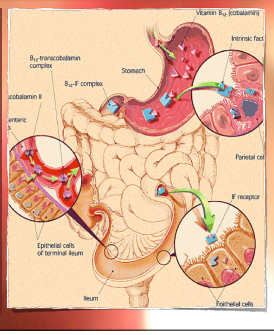
Sunlight	Fortified Foods	Supplements
Aim for at least 20 minutes of sunlight exposure daily	Dairy Grains Soymilk, almond milk, other alternatives Orange juice Mushrooms	Depending on blood levels, you may need to take a vitamin D3 supplement to ensure adequate levels D3 is better absorbed Have your physician check your vitamin D levels

Vitamin B_{12}: Cyanocobalamin

- Function: assists enzyme reactions, health of nerve and red blood cells, supports making DNA
- Deficiency:
  - megaloblastic anemia (large red blood cells)
  - neurologic changes: numbness in fingers and toes, unsteadiness, poor muscle coordination, forgetfulness, moodiness, mental slowness, poor memory, confusion, agitation, depression, delusions, hallucinations, psychosis, paranoia
  - Causes: inadequate intake, poor absorption, metabolic disorders

Vitamin B_{12} Absorption

- In food, B12 is bound to protein (free in supplements)
- Stomach acids separate protein and B12
- Intrinsic Factor (IF) released into stomach and binds B12
- IF-B12 complex absorbed by terminal cells of small intestine
- B12 is released by IF then enters blood stream



Vitamin B_{12} Absorption

- Amount absorbed is influenced by amount eaten
  - Eat more ➙ absorb less
  - Maximum absorbed: 5 micrograms
  - RDA = 2.4 micrograms per day (adults)
- Elderly have lower absorption due to less stomach acids to free B_{12} from food proteins

Vitamin B_{12} Storage

- 80% of absorbed B_{12} put in storage
- Adult stores can be 2-3 milligrams
- About 0.5 micrograms lost per day
- High stores can take 15-20 years to deplete
  - Total vegetarians & elderly at higher risk
- Fortified foods or supplements if older than 50 years of age

Vitamin B_{12}

Reliable Sources	Unreliable Sources	Supplements
B_{12} is made by bacteria, the only reliable food sources are found in meat, dairy, and eggs Fortified foods include soymilks and alternative milks, nutritional yeast, and fortified ready-to-eat cereals Read food labels	Tempeh, miso, spirulina, seaweed, brewers yeast, and leafy vegetables do not contain any significant level of B_{12} Yes, the bacteria in our colon can make B_{12} but it is unavailable to the body	Total vegetarians should take a supplement if not adequately consuming fortified foods Have your physician check your B_{12} levels 10-50 mcg daily

Omega-3 Fats

- Important for cardiovascular health, brain and eye development
- Recommended intake per day
  - Adult males 1.6 g ALA
  - Adult females 1.1 g ALA
  - Vegetarians may need slightly more

Omega-3 Fats

- ALA (alpha-linolenic acid)
  - Essential fatty acid - must be eaten because body cannot make it
  - Converted to EPA and DHA in the body
  - Canola oil, flax and flaxseed oil, walnuts, chia seeds, leafy green vegetables, fatty fish, breast milk

Omega-3 Fats

- EPA
  - About 10% conversion rate from ALA
  - Can also be retro-converted from DHA
  - Fatty fish, fish oil, breast milk
- DHA
  - Very little converted from ALA
  - Supplements are well absorbed
  - Algae oil, fatty fish, fish oil

Iron (Fe)

- Iron found in blood cells, muscle cells, linked with other compounds
- Deficiency: anemia
- Two dietary forms
  - Heme - found in meat
    - Easily absorbed
  - Non-heme - found in cereals, vegetables, legumes, fruits, etc
    - Increase absorption with Vitamin C

Iron

- Inhibit iron absorption
  - phytates
  - calcium
  - polyphenols found in tea, coffee, herb teas, cocoa
- Enhance iron absorption
  - Vitamin C
  - Food preparation
    - soaking, sprouting, leavening decreases phytate
    - fermentation

Iron

- Recommendations:
  - Vegetarians need more than non-vegetarians
  - Adult males 8 mg per day
  - Adult females 18 mg per day
  - Older than 50 years - 8 mg per day (males & females)
- Body may adapt to lower intake over long term

Iron

Beans & Legumes	Fruits & Vegetables	Grains & Other
Lentils boiled 1 cup = 7 mg Kidney beans boiled 1 cup = 5 mg Blackeye peas boiled 1 cup = 4 mg Pinto, navy, black beans boiled 1 cup = 4 mg Tofu raw 1/2 cup = 3 mg Pumpkin seeds 1 ounce = 3 mg	Dried apricots 1 cup = 2 mg Raisins 1/2 cup = 2 mg Spinach fresh boiled 1/2 cup = 3 mg Spinach frozen boiled 1/2 cup = 2 mg	Fortified instant oatmeal 1 packet = 11 mg Enriched quick grits 1 cup = 2 mg Molasses 1 tablespoon = 1 mg Bread 1 slice = 1 mg Enriched cereals

Iodine (I)

- Plants absorb iodine from soil
  - Soil may be deficient in high altitudes
- Iodine is component of thyroid hormones
- Deficiency: goiter, cretinism, stillbirth, abortion, congenital malformation
- Recommend: 150 micrograms per day (adult males & females)

Iodine

Plant Foods	Fortified Foods	Supplements
Seaweed (kelp, nori, kombu, wakame) are variable in content Fruit & vegetable content depends on soil, fertilizer, irrigation	Iodized salt in USA 45 mcg per 1 gram salt Enriched macaroni, canned corn, cereals, apple juice, etc	Listed as potassium iodide or sodium iodide May also use kelp (seaweed)

Zinc (Zn)

- Important for growth & development
- Incorporated into muscle, bone, skin, liver, brain, kidneys, heart, hair, blood
- Phytic acid (whole grains, legumes), oxalic acid (vegetables), and fiber decrease Zn absorption from food
- Absorption can be increased by:
  - food preparation (soaking, sprouting, leavening) - decreases phytate
  - vitamin C

Zinc Deficiencies

- Growth retardation
- Delayed sexual maturation
- Hair loss
- Diarrhea
- Eye & skin lesions
- Poor wound healing
- Impaired taste sensation
- Excess intake (1-2 g/d) → sideroblastic anemia

Zinc

- Body does not store zinc
- Must be consumed daily
- Recommended:
  - Adult males 11 mg per day
  - Adult females 8 mg per day

Zinc

Beans & Legumes	Nuts & Seeds	Grains
Lentils raw 1 cup = 9 mg Soybeans raw 1 cup = 9 mg Navy beans raw 1 cup = 8 mg Black beans raw 1 cup = 7 mg Chickpeas raw 1 cup = 7 mg Tofu firm raw 1/2 cup = 2 mg	Pumpkin seeds roasted 1 cup = 9 mg Roasted peanuts 1 cup = 9 mg Pine nuts dried 1 cup = 9 mg Cashews roasted 1 cup = 8 mg Almonds 1 cup = 4 mg	Wild rice raw 1 cup = 10 mg Durum wheat 1 cup = 8 mg Oats 1 cup = 6 mg Prepared cereals vary

* Starchy & root vegetables contain less than 1 mg

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