

Fortify Your Life The Case for Dietary Supplements



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"Fortify Your Life"
"Healthy At Home"
"Life Is Your Best Medicine"

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Center for Disease Control

Dietary deficiencies are well documented, and they have characteristic signs and symptoms. In addition, recent findings have determined that less than optimal biochemical levels have been associated with risks of adverse health effects. These health effects include cardiovascular disease, stroke, impaired cognitive function, cancer, eye diseases, poor bone health, and other conditions.

CDC: 2nd National Report on the Biochemical Indicators of Diet and Nutrition in the U.S. population

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State of Our Nutrition

- 90 million Americans are vitamin D deficient (using the levels set by the Endocrine Society <20 ng/ml)
- 30 million are deficient in vitamin B6
- 18 million people have B12 deficiency
- ~16 million have very low serum vitamin C
- 13% of Latinas and 16% of African American black women (ages 12-49) are iron deficient
- Women 25-39 borderline iodine insufficiency



CDC: 2nd National Report on the Biochemical Indicators of Diet and Nutrition in the U.S. population

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Who is at Risk?

- Those who are obese
- Ethnic/racial minorities
- Those with chronic disease
- Chronic medication use
- Families with food insecurity
- Those on restricted diets
- Those with “poor” diets
- Those with specific genetics variations



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Food is Foundational



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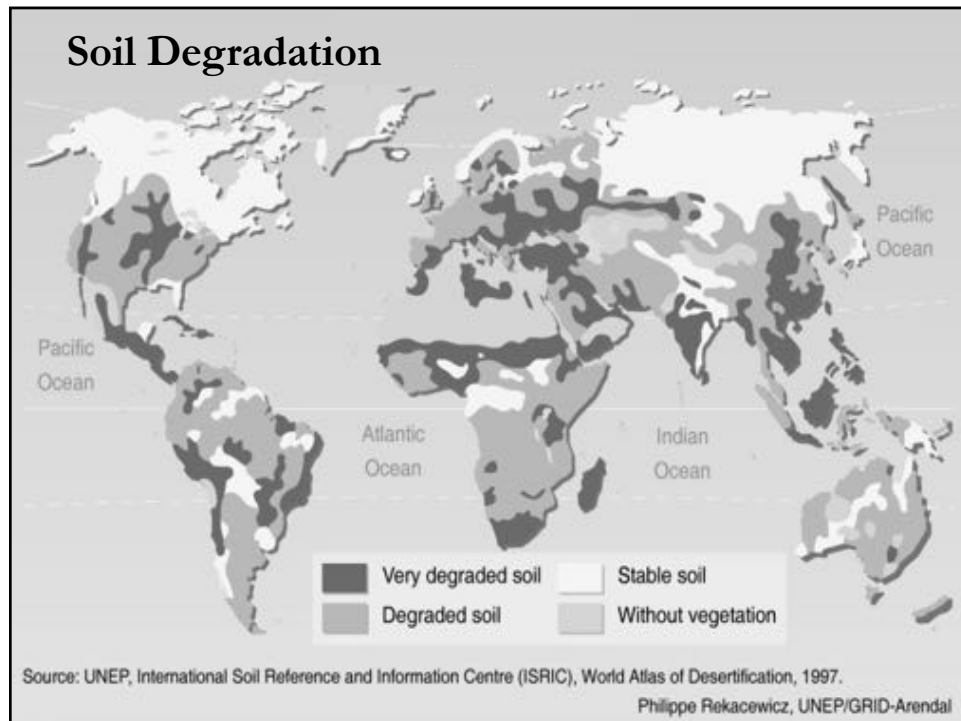


Over 3/4 of Canadians are not meeting Canada's Food Guide recommendations regarding the number of daily servings of fruits and vegetables.

Krueger H, et al. *Can J Public Health* 2017; Jun 16;108(2):e152-e161.

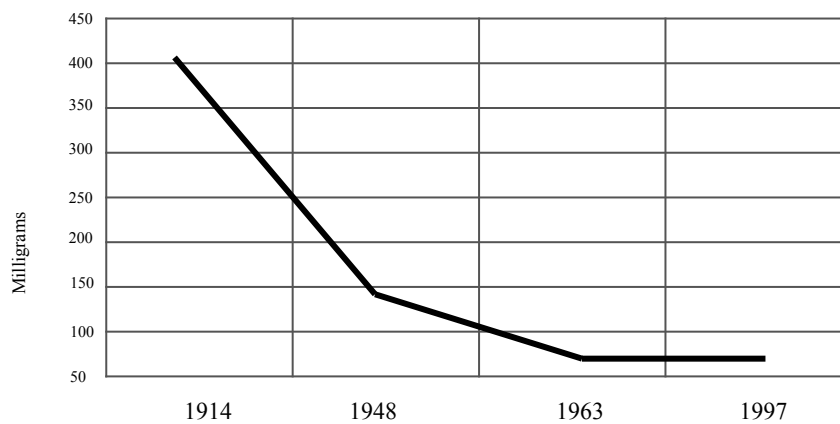
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Average Mineral Content in Selected Vegetables, 1914-1997

Sums of Average of Calcium, Magnesium, and Iron in Cabbage, Lettuce, Tomatoes and Spinach



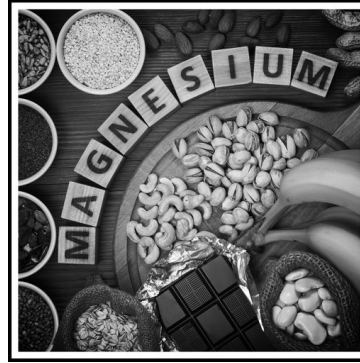
Source: Lindlahr, 1914; Hamaker, 1982; US Department of Agriculture, 1963 & 1997

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Magnesium

- Low magnesium intakes and serum levels associated with type 2 diabetes, metabolic syndrome, inflammation, high blood pressure, atherosclerotic vascular disease, sudden cardiac death, osteoporosis, migraine headache, asthma, and colon cancer.
- Canadian Health Measures Survey cycle 3 (2012-2013), study of serum magnesium concentrations (ages 3-79) 9.5–16.6% of adults and 15.8–21.8% of adolescents aged 12–19 years had a serum Mg concentration below the lower cut-off of the reference interval.
- A serum mag level below 0.75 mmol/L represents relatively severe Mg deficiency, so these results raise strong suspicions of significant Mg deficiency in the Canadian population. Diabetes was a strong predictor of lower magnesium levels. .
- FDA requires warning that proton pump inhibitors can cause dangerously low magnesium levels.

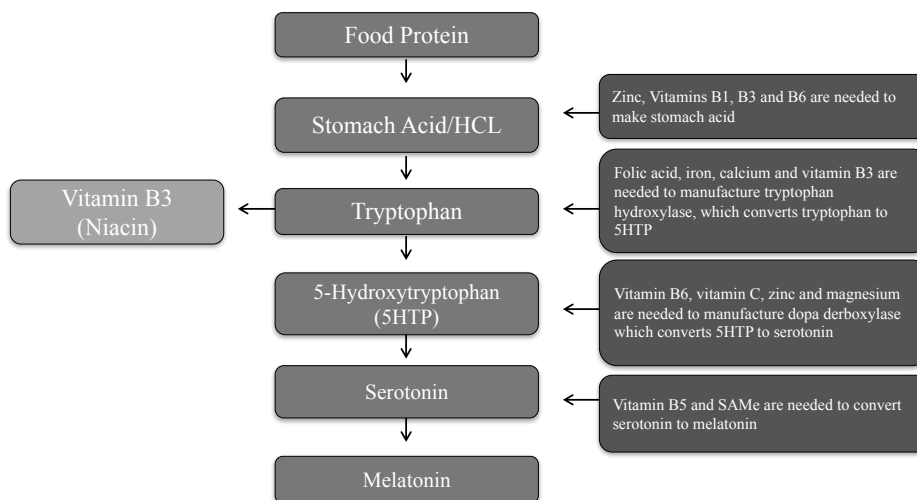


Rosanoff A, et al. *Nutr Rev* 2010;70(3):153-64
Bertinato J, et al. *Nutrients* 2017 Mar; 9(3): 296

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Serotonin and Melatonin Pathways



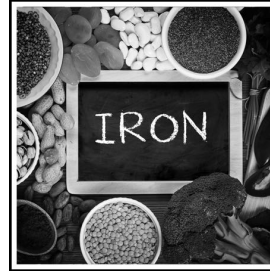
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Iron

WHO: Iron deficiency most common nutrient deficiency in world, affecting ~2 billion people.

- Anemia accounts for 20% of all global maternal deaths.
- Necessary for oxygen transport, DNA synthesis, electron transport, growth and development.
- Promotes resistance to disease; improves health of teeth, skin, and bones; maintains energy
- Iron deficiency increases the risk of lead toxicity.
- Iron levels tightly regulated, deficiency and excess are harmful to the body.



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Pregnancy: Increased Need

- The American Academy of Family Physicians, U.S. Preventive Services Task Force, and Centers for Disease Control and Prevention recommend routine screening of pregnant women for low iron.
- During pregnancy, body needs higher levels of iron because of the growing fetus, higher volume of blood, and blood loss that will occur during delivery.
- If a pregnant woman does not get enough iron, her baby is at higher risk for being *born prematurely with a low birth weight, lower IQ and poorer neurocognitive development.*



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Menstruation

- Marked differences between women in menstrual blood loss (10-250 mL per menses).
- Low iron levels *are the most common cause of anemia* in adolescent girls and can be very detrimental to *mood and cognition*, as well as *physical* well-being.
- Heavy menstrual bleeding is a significant risk for iron deficiency and is often overlooked.
- Data from cycle 2 (2009 to 2011) of Canadian Health Measures Survey, depleted iron stores were found in **13% of females aged 12-19** and **9% of females aged 20-49**.



Blitzer J, et al. *Gynecol Endocrinol* 2014;30(8):542-8.
 Nelson AL, et al. *Am J Obstet Gynecol* 2015; 213(1):97.e1-6.
 Cooper M, et al. *Health Rep* 2012;23(4):41-8.

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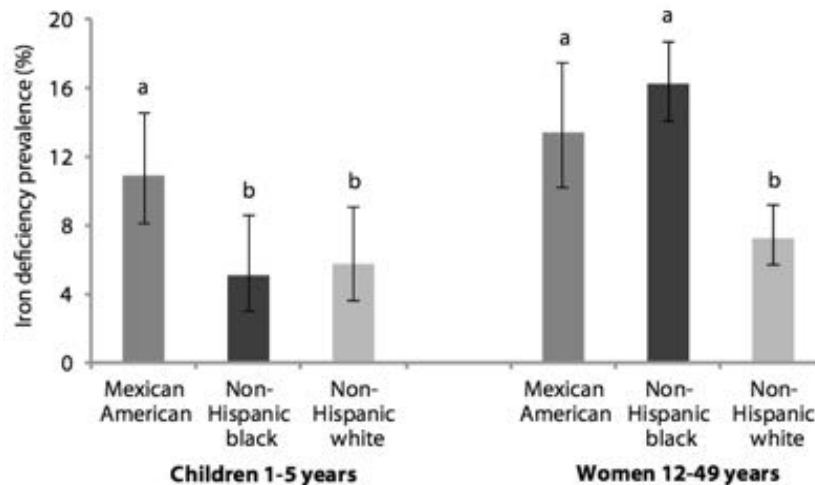


Figure H.3.a. Age-adjusted prevalence estimates of low body iron stores (<0 mg/kg) in U.S. children and women by race/ethnicity, National Health and Nutrition Examination Survey, 2003-2006.

Error bars represent 95% of confidence intervals. Bars are not sharing a common letter differ within children and women ($p < 0.05$). Age adjustment was done using direct standardization.

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To Get 18mg of Iron in Food

- 4 cups of raisins
- 3-5 cups instant oatmeal
- 3 cups Special K cereal**
- 3 cups cooked lentils
- 2.2 cups canned white beans
- 10 ounce beef liver
- 45 ounce chicken breasts
- 15 cups broccoli OR
- 3 cups cooked spinach



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Trial record 1 of 1 for: BLOOD BUILDER

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Low-dose Iron Supplementation and Markers of Iron Status Among Non-anemic, Iron-deficient Women

This study is ongoing, but not recruiting participants.

Sponsor:
University of Maryland

Information provided by (Responsible Party):
Chris D'Adamo, University of Maryland

ClinicalTrials.gov Identifier:
NCT02683369

First received: February 9, 2016
Last updated: March 28, 2017
Last verified: March 2017
[History of Changes](#)

[Full Text View](#) [Tabular View](#) [No Study Results Posted](#) [Disclaimer](#) [How to Read a Study Record](#)

► Purpose

Healthy premenopausal women that are iron-deficient without anemia will receive a low-dose iron dietary supplement. The investigators seek to determine if the low-dose iron dietary supplement will restore iron levels to normal range with fewer side effects than typically experienced at higher doses of iron supplementation.

Condition	Intervention	Phase
Non-anemic Iron Deficiency	Dietary Supplement: Blood Builder /Iron Response®	Phase 2 Phase 3

Study Type: Interventional
Study Design: Intervention Model: Single Group Assignment
Masking: None (Open Label)
Primary Purpose: Treatment

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Vitamin B6 (Pyroxidal-5-Phosphate)

- Critically involved in production of serotonin, dopamine, melatonin, hemoglobin, protein metabolism, energy production, and more.
- Deficiency: depression; impaired cognition, attention, memory, and sleep. Increased risk for heart disease, stroke and colorectal cancer.
- Common OTC analgesics and oral contraceptives lower B6 levels. 30 MILLION Americans are deficient in B6.
- Need ~6 mg per day to maintain normal serum level.



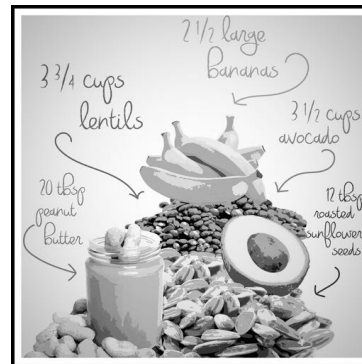
Larsson SC, et al. *JAMA* 2010; 303(11):107783
 Morris MS, et al. *Am J Clin Nutr* 2008; 87(5):1446-54
 Ulvik A, et al. *Am J Clin Nutr* 2014; 100(1):250-5

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To Get 1.5mg of B6 in Food

- 2.5 bananas
- 12 Tbsp. roasted sunflower seeds
- 8 ounces chicken breast
- 8 ounces sockeye salmon
- ~5 ounces cooked tuna
- ~5 ounces beef liver
- 3.5 cups raw diced avocado
- 3 cups sweet potatoes
- 15 cups of milk OR
- 20 Tbsp. peanut butter

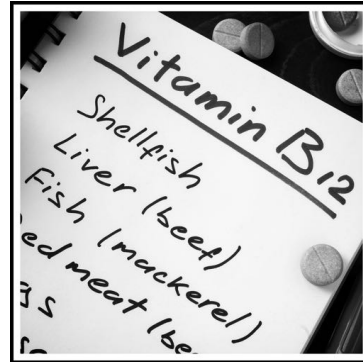


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Vitamin B12

- Found in animal and fortified foods.
- Deficiency: sore tongue, constipation, anemia, neurological disorders (numbness/tingling feet, difficulty walking, memory loss, dementia)
- Metformin (Glucophage) used to treat diabetes strongly associated with low vitamin B12. PPIs can also lower B12 levels, as well as strict vegan diet, aging and malabsorption.
- **18 million Americans are deficient in vitamin B12**



Niafar M, et al. *Intern Emerg Med* 2015; 10(1):93-102.

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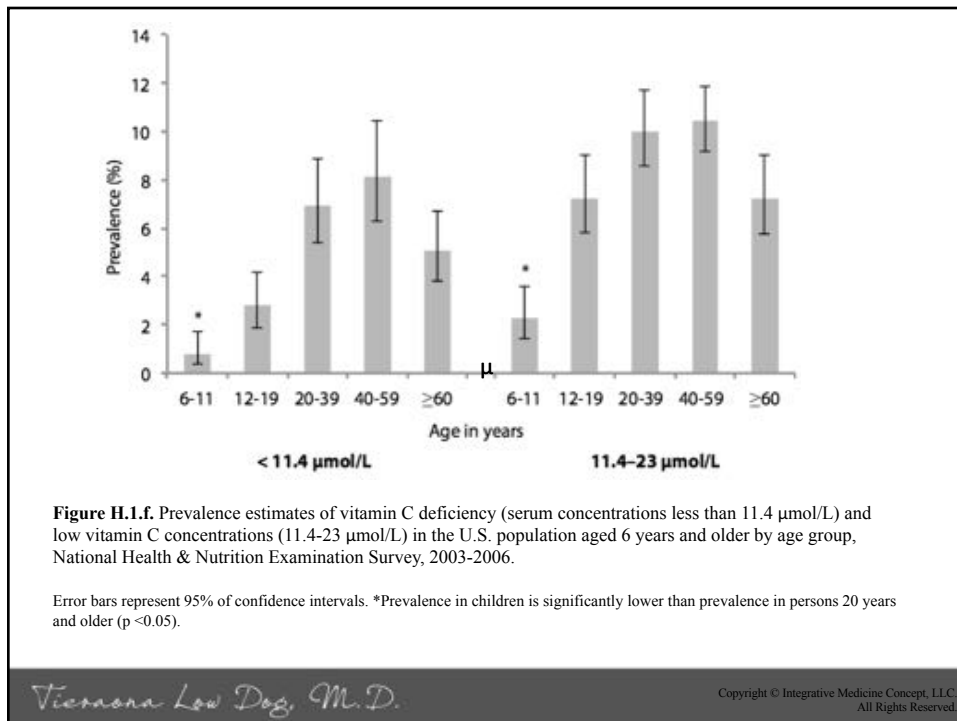
Vitamin C

- Potent antioxidant, activates folate, needed to convert tryptophan to serotonin, cofactor in synthesis of carnitine, thyroxin, norepinephrine, dopamine and immune cells
- Vitamin C levels decline rapidly during periods of emotional and physical strain, and illness.
- As levels fall, collagen synthesis impaired: bruise more easily, skin becomes thick and dry, wounds take longer to heal, joints hurt, fatigue.
- Recommend 200 mg 1-2 times daily.



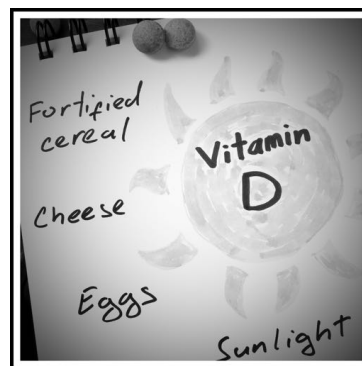
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Vitamin D

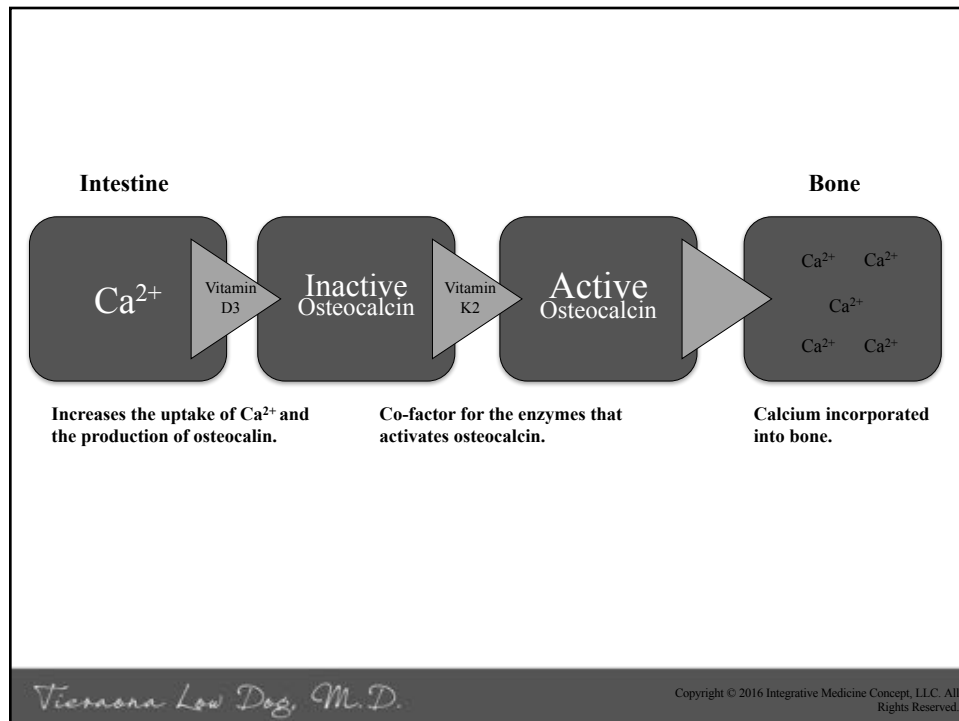
- Vitamin D interacts with more than 1000 genes
- Vitally important for calcium regulation (bones, heart, etc.)
- Studies show that higher blood levels of vitamin D improve breast cancer survival and reduce risk of colorectal cancer.
- Low vitamin D in adults causes muscle weakness and lower back and hip pain.
- Obesity increases the risk of deficiency..



Kim Y, et al. Br J Cancer 2014; 110(11):2772-84.
Ma Y, et al. J Clin Oncol 2011; 29(28):3775-82

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Vitamin D in Canadian Children

- Data from children aged 3-18 years (n= 2270) who participated in the 2012/2013 Canadian Health Measures Survey were analyzed.
- Researchers used serum 25(OH)D concentrations <30 nmol/l as 'deficient' (12 ng/ml) and ≥50nmol/l as 'sufficient' (20 ng/ml).
- Of all children, 5.6 % were vitamin D deficient and 71 % were vitamin D sufficient.
- However, it should be noted that the Endocrine Society states that a level of 75 nmol/l (30 ng/ml) is considered sufficient and a level under 50 nmol/l is deficient. The TRUE extent of low vitamin D in children may be far greater. Greater risk for low vitamin D found in children who were obese, non-white, and low income.

Munsainghe LL, et al. *Br J Nutr* 2017; 117(3):457-465.

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Vitamin D

To get 600 IU/d Vitamin D3:

- 3-4 ounces sockeye salmon, cooked
- 11.4 ounces water-packed tuna
- 26 oil-packed sardines
- 15 large eggs
- 5 cups fortified milk OR
- 30-45 ounces yogurt



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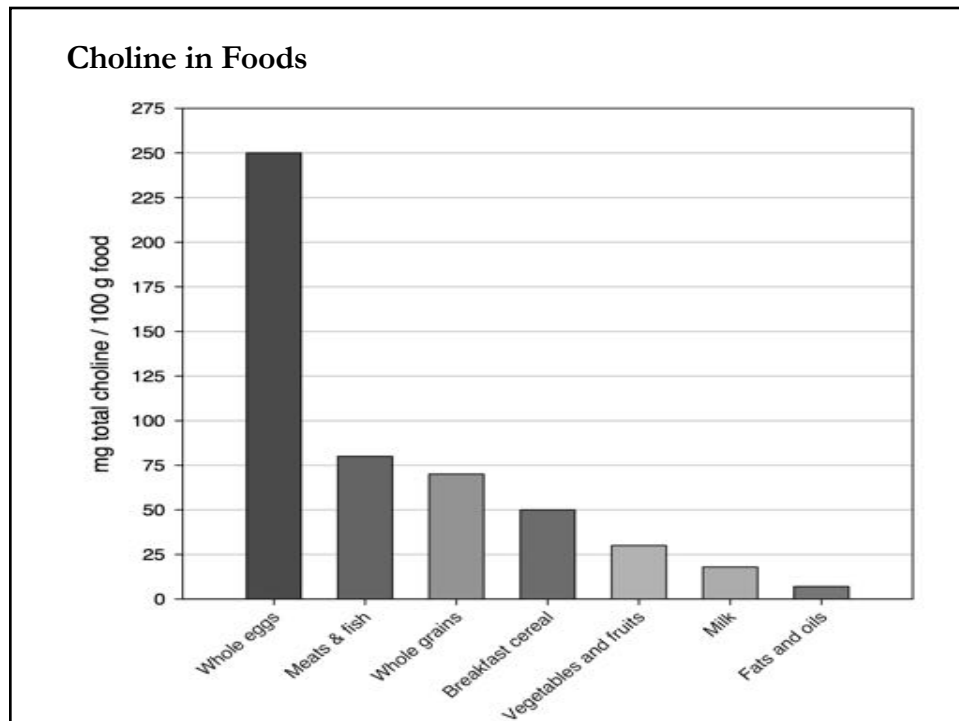
Choline

- Water soluble nutrient in the B-vitamin family that is particularly crucial during pregnancy and the first three years of a child's life.
- Deficiency may be associated with permanent changes in brain function that negatively impact intelligence, memory, mood regulation, and stress response.
- Necessary for production of VLDL – critical for the prevention of fatty liver disease.
- FDA set a daily value of 550 mg per day in July of 2016.



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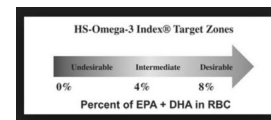
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American Heart Association

- “Omega-3 fish oil supplements prescribed by a healthcare provider may help prevent death from heart disease in patients who recently had a heart attack and may prevent death and hospitalizations in patients with heart failure.”
- There was insufficient evidence to evaluate the role of fish oil supplements in primary prevention of CVD.
- Do YOU know your “O?”

Siscovick DS, et al. Circulation 2017; Mar 13.



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Omega 3 and Asthma

- Reduced intake of omega-3 fatty acids may be a contributing factor to the increasing prevalence of wheezing disorders.
- Reviewers found that supplementation with omega-3 fatty acids in the third trimester of pregnancy **reduced the absolute risk of persistent wheeze or asthma and infections of the lower respiratory tract in offspring by approximately 33%.**

Bisgaard H, et al. N Engl J Med 2016; Dec 29;375(26):2530-9

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Canadians and Omega 3

- The Omega-3 Index indicates the percentage of EPA+DHA in red blood cell fatty acids.
- Canadian government found that the mean Omega-3 Index level of Canadians aged 20-79 was 4.5%.
 - Levels higher for women, older adults, Asians and other non-white Canadians, omega-3 supplement users, and fish consumers; levels lower for smokers and people who were obese.
- Fewer than 3% of adults had levels associated with low CHD risk; 43% had levels associated with high risk.

Langlois K, et al. *Health Rep* 2015; Nov 18;26(11):3-11

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Resources

- *Fortify Your Life*, Tieraona Low Dog, MD with National Geographic
- Dietary Supplement Label Database: dslid.nlm.nih.gov
- NIH National Center for Complementary and Integrative Health (NCCIH): nccih.nih.gov
- Office of Dietary Supplements: ods.od.nih.gov
- Linus Pauling Institute: lpi.oregonstate.edu
- Consumer Labs: www.consumerlabs.com
- Natural Medicines Comprehensive Database: naturaldatabase.com

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