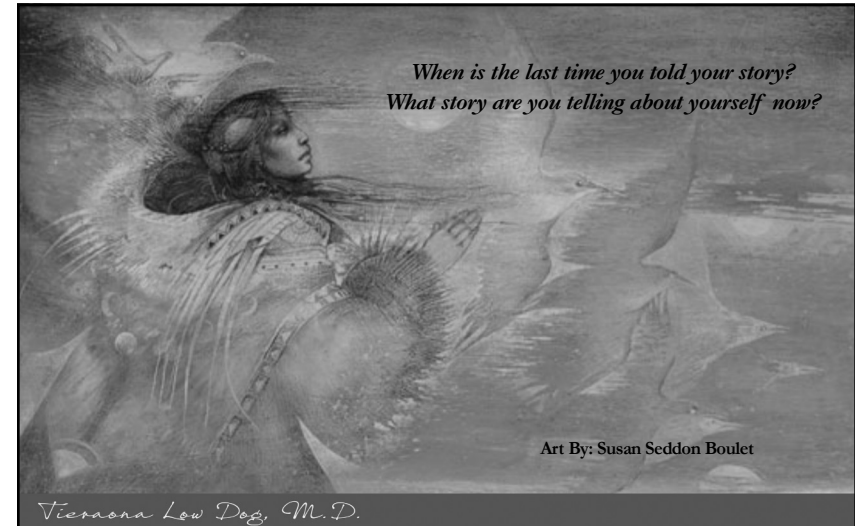


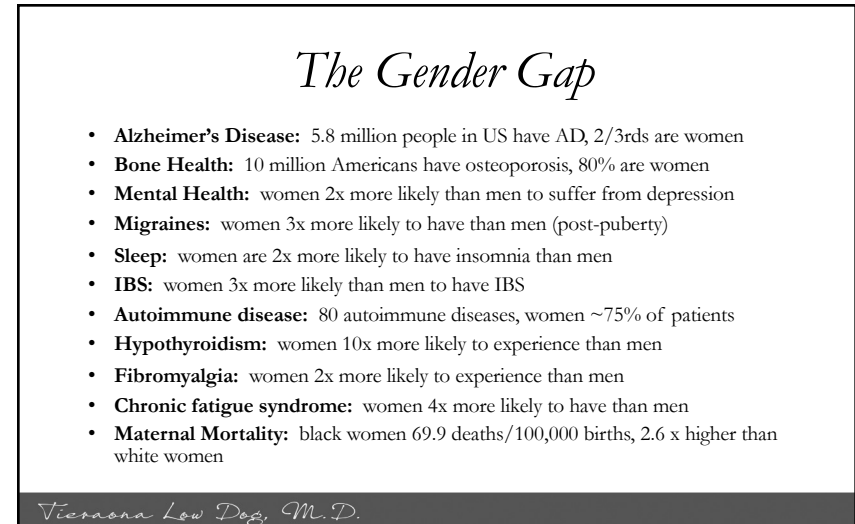
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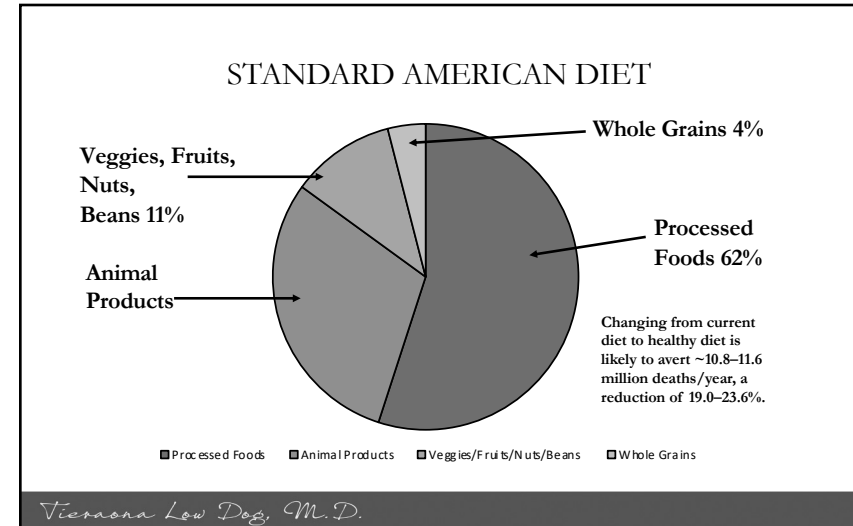


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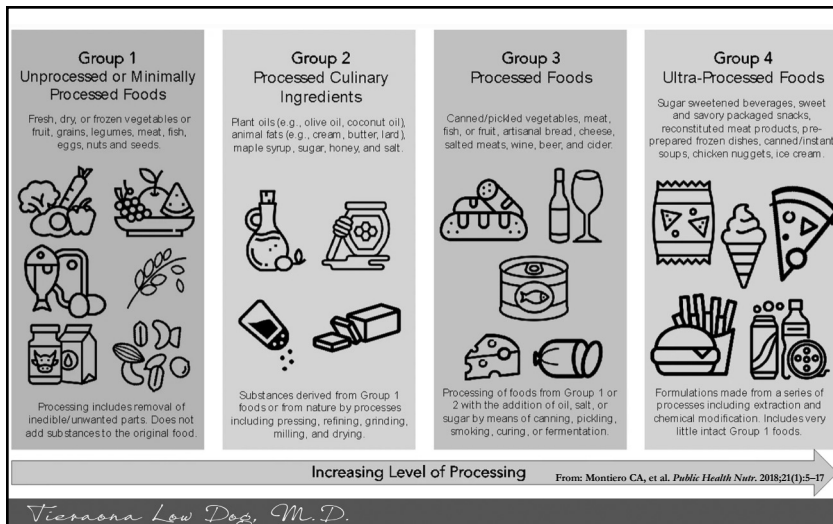




9



10



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## The Rise of Ultra-Processed Foods

- UPF are "snacks, drinks, ready meals, and many other products created **mostly or entirely** from substances extracted from foods or derived from food constituents with **little if any intact food**."<sup>1</sup>
- Quick, tasty, and often cheap.** Increasingly found in "health" foods.
- UPF from *animals or plants* has been shown to harm the microbiome and drive inflammation.<sup>2</sup>
- In US, **57% of total calories for adults**<sup>3</sup> and **67% for children**<sup>4</sup> come from UPF.
- Observational studies show association between UPF and **cancer, heart disease, obesity, and other chronic health problems.**

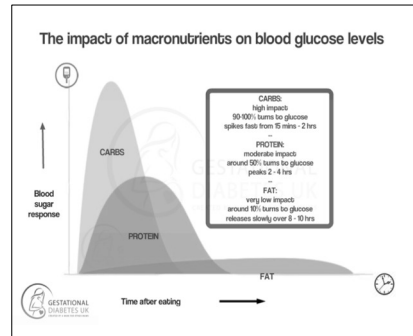
1. Willett W, et al. *Lancet* 2019 February 2; 393, (10170): 447-492.  
2. Secor R, et al. *Lancet Gastroenterol Hepatol* 2022 Dec;7(12):1128-1140.  
3. Judd F, et al. *Am J Clin Nutr* 2022; 115(1):211-221.  
4. Wang L, et al. *JAMA* 2021; 326(6):519-530

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## Refined Carbohydrates

- Overdo processed/refined carbs, **blood sugar rises, insulin released, store extra glucose as fat, drives inflammation.**
- Blood sugar goes up and then can plummet, **leaving one tired and disrupting sleep/wake cycle.**
- **Eating lots of carbs makes one crave lots of carbs (dopamine rush).**
- High-sugar diets cause **dysbiosis and degrade intestinal barrier, leading to systemic inflammation.**



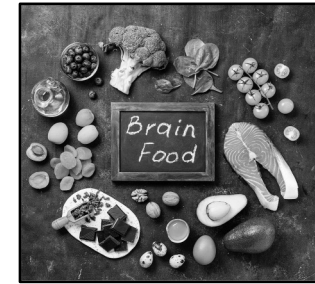
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## Fiber, Processed Foods, and Depression

- Consumption of **sweetened beverages and refined foods** is associated with an **increased risk of depression** in longitudinal studies.
- Women's Health Initiative (n = 87,618): higher consumption of **dairy products, fiber, fruit (not juice), and vegetables** was significantly associated with **LOWER odds of depression**; **refined grain** consumption was associated with **increased odds of depression in menopausal and post-menopausal women.**



Gangwisch JE, et al. High Glycemic Index Diet as a Risk Factor for Depression: Analyses From the Women's Health Initiative. *Am J Clin Nutr* 2015 Aug;102(2):454-63.

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## Glycemic Load and Mood

- **Glycemic load:** measurement of how a **serving of a particular food impacts blood sugar.**
- **82 healthy weight or healthy overweight or obese adults** enrolled in 28-day randomized, crossover-controlled feeding study.
- Compared to low GL diet, a **high GL diet** resulted in:
  - 38% higher score for **depressive symptoms** ( $P = 0.002$ )
  - 55% higher score for **total mood disorder** ( $P = 0.05$ )
  - 26% higher score for **fatigue/inertia** ( $P = 0.04$ )



Breymeyer KL, et al. *Appetite* 2016; Dec 1;107:253-259.

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## Glycemic Load & Cortisol

- Studies show high glycemic load meals significantly **increase cortisol (stress hormone).**
- **Protein and fat** significantly **decreased cortisol** when compared to carbohydrates.
- **Low glycemic load diet** beneficial for overall health and **particularly those with chronic stress.**

Low GI Diet Tracker App



Martens MJ, et al. Effects of single macronutrients on serum cortisol concentrations in normal weight men. *Physiology & Behavior* 2010; 101(5): 563-67

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Food	Serving Size	Glycemic Load	Food	Serving Size	Glycemic Load
Grapefruit	½ large	3	Spaghetti	1 cup	38
Apple	1 medium	6	Brown rice	1 cup	23
Banana	1 large	14	White rice	1 cup	33
Raisins	1 small box	20	White bread	1 slice	10
Watermelon	1 cup	8	Whole grain bread	1 slice	5
Carrots	1 large	5	Bagel, cinnamon raisin	1 3.5 inch	24
Orange	1 medium	6	Pumpkin bread	1 slice	6
Sweet potato	1 cup	17	Macaroni and cheese	1 cup prepared	31
Baked potato	1 medium	28	Chocolate doughnut	1 doughnut (80 g)	25
French fries	1 medium serving	26	Glazed doughnut	1 doughnut (80 g)	12
Snickers	1 bar	35	Kellogg's Frosted Flakes	¾ cup	20
Reese's cup	1 miniature	2	Kellogg's Special K	1 cup	14
White table wine	5 ounces	1	Post Bran Flakes	¾ cup	12
Red table wine	5 ounces	1	Post Raisin Bran	1 cup	25
Grape juice	6 ounces	12			

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## Eat More Fiber and Less Sugar

- Gut bacteria ferment certain fibers for fuel, increasing diversity of gut microbiota.
- Modulates immune system, 70% of immune system in GI tract.
- Diets low in fiber, high in sugar reduce *Bifidobacterium* and degrade barrier function, key part of innate immunity.
- Adequate Intake of dietary fiber:  
- 26 g/d women

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Fruits	Serving size	Total fiber (grams)*
Raspberries	1 cup	8.0
Pear	1 medium	5.5
Apple, with skin	1 medium	4.5
Banana	1 medium	3.0
Orange	1 medium	3.0
Strawberries	1 cup	3.0

Vegetables	Serving size	Total fiber (grams)*
Green peas, boiled	1 cup	9.0
Broccoli, boiled	1 cup chopped	5.0
Turnip greens, boiled	1 cup	5.0
Brussels sprouts, boiled	1 cup	4.0
Potato, with skin, baked	1 medium	4.0
Sweet corn, boiled	1 cup	3.5
Cauliflower, raw	1 cup chopped	2.0
Carrot, raw	1 medium	1.5

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/high-fiber-foods/art-20050948>

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Grains	Serving size	Total fiber (grams)*
Spaghetti, whole-wheat, cooked	1 cup	6.0
Barley, pearled, cooked	1 cup	6.0
Bran flakes	¾ cup	5.5
Quinoa, cooked	1 cup	5.0
Oat bran muffin	1 medium	5.0
Oatmeal, instant, cooked	1 cup	5.0
Popcorn, air-popped	3 cups	3.5
Brown rice, cooked	1 cup	3.5
Bread, whole-wheat	1 slice	2.0

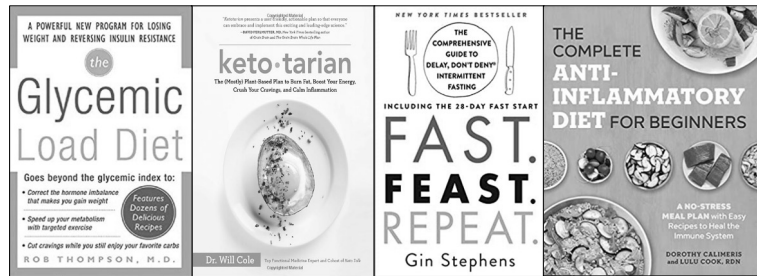
Legumes, nuts and seeds	Serving size	Total fiber (grams)*
Split peas, boiled	1 cup	16.0
Lentils, boiled	1 cup	15.5
Black beans, boiled	1 cup	15.0
Baked beans, canned	1 cup	10.0
Chia seeds	1 ounce	10.0
Almonds	1 ounce (23 nuts)	3.5
Pistachios	1 ounce (49 nuts)	3.0
Sunflower kernels	1 ounce	3.0

<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/high-fiber-foods/art-20050948>

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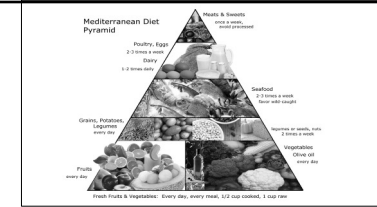
## A Few of My Favorite Resources



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## Mediterranean Diet Inflammation & Memory



- **Dietary Inflammatory Index** measures inflammation in the body in response to specific foods (~1,900 studies).
- **Mediterranean diet associated with lower dementia risk.** Researchers evaluated inflammatory potential of diet in relation to mild cognitive impairment/dementia risk during ~9.7 years during WHI Memory Study.
- **Higher inflammatory scores** were significantly associated with *greater cognitive decline and earlier onset of cognitive impairment.*

Hayden KM, et al. The association between an inflammatory diet and global cognitive function and incident dementia in older women: The Women's Health Initiative Memory Study. *Alzheimer's Dement* 2017 May 19. pii: S1552-5260(17)30185-1.

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## Inflammatory Food Ratings

200 or higher	Strongly anti-inflammatory
101 to 200	Moderately anti-inflammatory
0 to 100	Mildly anti-inflammatory
-1 to -100	Mildly inflammatory
-101 to 200	Moderately inflammatory
-201 or lower	Strongly inflammatory

FOOD	SERVING SIZE	SERVING SIZE (GRAMS)	IF RATING
AGAVE NECTAR	1 TBSP	21	-74
ALMOND BUTTER	¼ CUP	64	100
CHEESE, CHEDDAR	1 OUNCE	28.35	-20
CHICKEN BREAST, RSTD	3 OUNCES	85	-19
MILK, WHOLE	1 CUP	246	-46
OLIVE OIL	1 TBSP	14	74
ONIONS, COOKED	½ CUP	105	240
RICE, WHITE	1 CUP	158	-153
SPINACH	1 CUP	30	75
SALMON, SOHO BAKED	3 OUNCES	85	450
TURMERIC	½ TSP	1.5	338

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<https://imaginehealthy.org>

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## Micronutrient Status of Women in US

- Micronutrient deficiency risk is most *common in women* (37% overall)
  - 19–50 years (41%)
  - Pregnant or breastfeeding women (47%)
- Those who **didn't** take dietary supplements had *highest risk* of deficiency (40%) compared to those taking **multivitamin/mineral** (14%).
- Those eating an **adequate diet** based on the **estimated average requirement (EAR)** had a **lower risk of any deficiency (16%)**, compared to those with **inadequate diet** (57%).

Bird JK, et al. *Nutrients* 2017 Jun 24;9(7):655.

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## Iron

- Low iron *most common cause of anemia* in young women; detrimental to **mood, cognition, physical well-being**.
- **Prenatal** and early childhood iron deficiency associated with **long-term neurobehavioral damage** may not be reversible, even with treatment.
- **RDA** for females:
  - 14–18 yrs.: 15 mg/d
  - 19–50 yrs.: 18 mg/d
  - Pregnant: 27 mg/d
  - Breastfeeding: 9 mg/d
  - 51 and older (*and men*): 8 mg/d

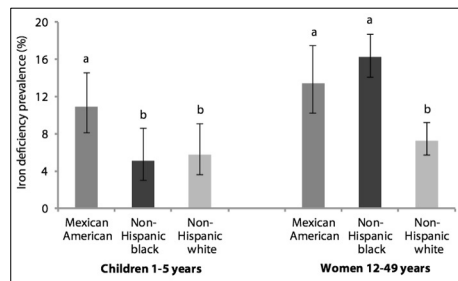


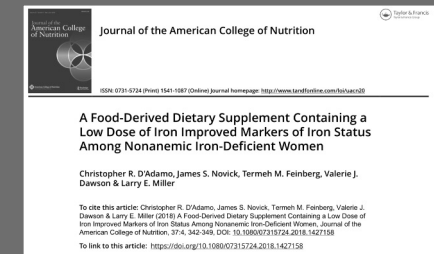
Image: <https://www.cdc.gov/nutritionreport/pdf/Traice.pdf> Accessed May 7, 2021

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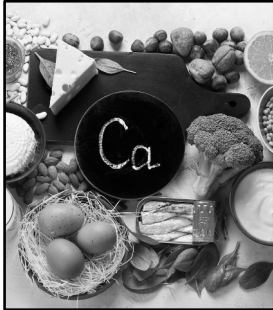


Product Used in Study Below



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## Calcium for PMS



- Majority of **14 studies** showed serum calcium levels are **lower in women with PMS**, and calcium supplementation can **significantly improve the incidence of PMS and its related symptoms**.
- Dose: **600–1200 mg/d used in most studies**. Absorption best with **500 mg or less**. Calcium citrate better tolerated than carbonate.
- Most women only need to take **500 mg per day for PMS**, along with **vitamin D** (helps calcium absorption).

*Arab A, et al. Beneficial Role of Calcium in Premenstrual Syndrome: A Systematic Review of Current Literature Int J Prev Med 2020 Sep 22;11:156.*

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## Chaste Berry Fruit (*Vitex agnus castus*)



Verkaik S. The treatment of premenstrual syndrome with preparations of Vitex agnus-castus: a systematic review and meta-analysis. *Am J Obstet Gynecol*. 2017;217(2):150-166

- *Part used:* dried ripe fruit
- German health authorities approve for **irregular menses, PMS, and cyclical breast tenderness**.
- Meta-analysis PMS: **9/10 studies found Vitex superior to placebo** (one negative study used ground fruit/not extract). **Vitex similar to oral contraceptives** in two studies, **similar to fluoxetine in one study (PMDD)**, and **not as effective on HAM-D as fluoxetine** in another (PMDD).
- **In summary: there is good evidence Vitex is beneficial for PMS/PMDD.**
- **Dose: 400 mg dried fruit taken once per day.**

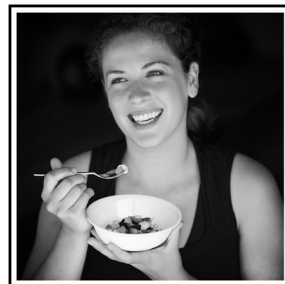
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## Oral Contraceptives & Vitamin B6

- Majority of women on OCPs have **low serum B6 levels**, even when meeting dietary RDA.<sup>1</sup>
- **Oral contraceptive use in US 2017–2019:**<sup>2</sup>
  - **19.5% of women aged 15–19**
  - **21.6%**
  - **aged 20–29**
  - **10.9% aged 30–39**
  - **6.5% of women aged 40–49**
- Low B6: microcytic anemia, depression, poor concentration, fatigue, etc.
- Women who discontinue OCs and become pregnant may be at **increased risk for preterm birth and early pregnancy loss**.<sup>3</sup>



1. Morris MS, et al. *Am J Clin Nutr* 2008; 87(5):1446-54
2. [www.cdc.gov/nchs/products/databriefs/db388.htm](https://www.cdc.gov/nchs/products/databriefs/db388.htm)
3. Wilson SAC. *Nutr Rev* 2011 Oct; 69(10):572-83

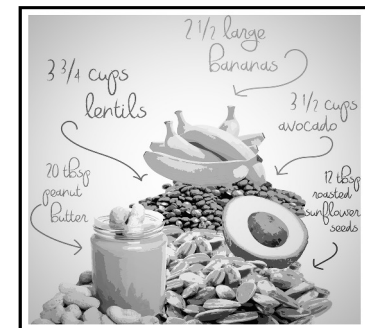
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## Vitamin B6 in Women's Health

- ACOG recommends 10–25 mg vitamin B6 3–4 times daily for **nausea/vomiting pregnancy**.<sup>1</sup>
- Studies show B6 can **improve PMS symptoms and reduce the risk for postpartum depression**.<sup>2,3</sup>
- Low periconceptional B6 (PLP < 30 nmol/L) reduces probability of conception.<sup>4</sup>
- Do **NOT** exceed 100 mg per day.

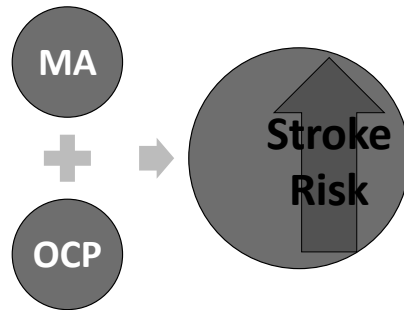
1. ACOG Practice Bulletin 189. *Obstet Gynecol* 2018 Jan;131(1):e15-e30.
2. Retallik-Brown H, et al. *J Altern Complement Med* 2020; 26(2):88-97
3. Khodadad M, et al. *Journal Pharm Res International* 2017; 19(1): 1-9
4. Ho CL, et al. *Nutrients* 2016; Sep 18(9).



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## Migraine, OCPs, & Stroke

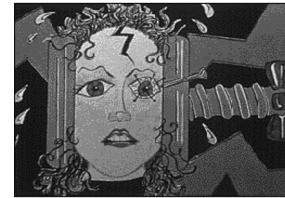


IHS: low-dose estrogen in women with simple visual aura  
ACOG: progestin only, intrauterine or barrier contraception  
WHO: absolute contraindication in all women with migraine with aura

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## Magnesium for Migraines

- Migraine disproportionately affects women. Impacts 1 in 4 households. Studies show migraineurs have low brain magnesium during migraine attacks.
- American Academy of Neurology and American Headache Society concluded that magnesium therapy is “*probably effective*” for migraine prevention. Canadian Headache Society: **strong recommendation for magnesium for prophylaxis of migraine (also for riboflavin).**

Rajapakse T, et al. Nutraceuticals in Migraine: A Summary of Existing Guidelines for Use. *Headache* 2016; 56(4):808-16.

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## Magnesium for Migraines in Pregnancy



- Magnesium is “safe and effective preventive therapy for episodic migraines in pregnancy.”
- Decreases the **frequency, severity, and duration of migraine headaches.**
- When additional treatment was needed, **94%** of migraines were controlled with the combination **magnesium and riboflavin.**
- May help reduce leg cramps in pregnancy

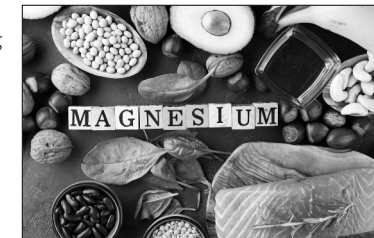
Assessing the efficacy of magnesium oxide and riboflavin as preventative treatment of migraines in pregnancy. *American Journal of Obstetrics Gynecology*  
<https://doi.org/10.1016/j.ajog.2021.11.1136>.

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## Magnesium & Women's Health

- 2017 review: magnesium supplementation effective in preventing **menstrual cramps, PMS, menopausal symptoms.**<sup>1</sup>
- May relieve **leg cramps** in pregnancy.<sup>1</sup>
- 400–600 mg/d effective for **preventing menstrual migraine.**<sup>2</sup>
- Can reduce symptoms of **depression/anxiety** alone and in combination with **vitamin B6.**<sup>3</sup>
- **Relaxing and calming in general.**



1. Parazzini F, et al. *Magnesium Res* 2017 Feb 1;30(1):1-7.
2. Garrison SR, et al. *Cochrane Database Syst Rev* 2020; 9(9):CD009402.
3. Pouteau E, et al. *PLoS One* 2018;13(12):e0208454.

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## Magnesium

- **Heart disease #1** cause of death for females.
- Rotterdam study 9,820 participants (mean 65.1yrs, 56.8% female): **low serum magnesium** associated with an **increased risk of coronary heart disease mortality** and **sudden cardiac death**.<sup>1</sup>
- **1 in 9 women have diabetes**. **Insulin resistance decreases magnesium levels**, and **diabetics** with low magnesium show **more rapid disease progression** and increased risk for **diabetes-related complications**.<sup>2</sup>



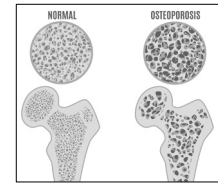
1. Kieboom BCT, et al. *J Am Heart Assoc* 2016 Jan; 5(1): e002707. 2. Bertinato J, et al. *Nutrients* 2017 Mar; 9(3): 296

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## Magnesium and Bone



- Essential cofactor for **vitamin D synthesis and activation** and is a crucial cofactor for enzymes necessary for **synthesis of bone matrix**.<sup>1</sup>
- A meta-analysis and systemic review of **six cohort studies, one case-control study, and five cross-sectional studies** in adults aged **≥60 years** found that **higher intake of magnesium** was associated with **higher hip and femoral neck bone mineral density**.<sup>1</sup>

Groenendijk I, et al. Impact of magnesium on bone health in older adults: A systematic review and meta-analysis. *Bone* 2022; 116233

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## Proton Pump Inhibitors & Magnesium

- PPIs interfere with passive and active magnesium absorption.
- March 2011, **FDA** warned long-term PPI use (>one year) could cause **dangerously low magnesium levels** and **recommends checking magnesium levels prior to starting PPI and then periodically**.
- **2015 meta-analysis** (n=109,798) found **63% increased risk** of hypomagnesemia in those taking PPIs compared to non-users.<sup>1</sup>
- **2018 review** of patients hospitalized for extreme hypomagnesemia found **70% were taking PPIs**.<sup>2</sup>

1. Cheungpasitporn W, et al. *Ren Fail* 2015. 2. Cheminet G, et al. *Intern Emerg Med* 2018

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Table 2: Magnesium Content of Selected Foods [10]

Food	Milligrams (mg) per serving	Percent DV*
Pumpkin seeds, roasted, 1 ounce	156	37
Chia seeds, 1 ounce	111	26
Almonds, dry roasted, 1 ounce	80	19
Spinach, boiled, ½ cup	78	19
Cashews, dry roasted, 1 ounce	74	18
Peanuts, oil roasted, ¼ cup	63	15
Cereal, shredded wheat, 2 large biscuits	61	15
Soy milk, plain or vanilla, 1 cup	61	15
Black beans, cooked, ½ cup	60	14
Edamame, shelled, cooked, ½ cup	50	12
Peanut butter, smooth, 2 tablespoons	49	12
Potato, baked with skin, 3.5 ounces	43	10
Rice, brown, cooked, ½ cup	42	10
Yogurt, plain, low fat, 8 ounces	42	10
Breakfast cereals, fortified with 10% of the DV for magnesium, 1 serving	42	10
Oatmeal, instant, 1 packet	36	9
Kidney beans, canned, ½ cup	35	8
Banana, 1 medium	32	8

## Magnesium

Age	Male	Female	Pregnancy	Lactation
Birth to 6 months	30 mg*	30 mg*		
7-12 months	75 mg*	75 mg*		
1-3 years	80 mg	80 mg		
4-8 years	130 mg	130 mg		
9-13 years	240 mg	240 mg		
14-18 years	410 mg	360 mg	400 mg	360 mg
19-30 years	400 mg	310 mg	350 mg	310 mg
31-50 years	420 mg	320 mg	360 mg	320 mg
51+ years	420 mg	320 mg		

\*Adequate Intake (AI)

High doses can lead to diarrhea and abdominal cramping. Forms most likely to cause diarrhea include magnesium carbonate, chloride, gluconate, and oxide.

[ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/](https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/)

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### Riboflavin for Migraines



- CHS guidelines gave strong recommendation for benefit, and minimal side effects
- **Teenage girls often low in riboflavin**
- AAN/AHS give riboflavin Level B recommendation, **probably effective** and should be considered for migraine prevention (400 mg/d)
- **Deficiency:** increases **light sensitivity**

Rajapakse T, et al. Nutraceuticals in migraine: a summary of existing guidelines for use. *Headache* 2016; Apr;56(4):808-16.

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### The ultimate supplement for migraine sufferers



#### Supplement Facts

Serving Size 1 Packet (9.5g)  
Servings Per Container 30

	Amount per serving	% Daily Value
Calories	25	
Total Carbohydrate	1g	<1%*
Riboflavin	400 mg	30769%
Iron	2.4 mg	13%
Magnesium (as Magnesium Bisglycinate Chelate)	400 mg	95%
Coenzyme Q10	150 mg	†

\*Percent Daily Values are based on a 2,000 calorie diet.  
†Daily Value not established

Other Ingredients: Citric acid, natural flavors, rebudioside A, and steviol glycosides.

**Note: no financial relationship with product. Example only.**

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### Ginger Rhizome (*Zingiber officinale*)

- Ginger used for thousands of years for **arthritis, muscular aches, and pains, headaches, congestion, coughs, sinusitis, nausea, colic, cramps, indigestion, flu, etc.**
- Human studies have shown that ginger:
  - Treats and prevents **migraine headaches**.<sup>1</sup>
- Endorsed by American College of Obstetrics and Gynecology as **first-line treatment for morning sickness** (250 mg 4 x day).<sup>2</sup>
- 6 randomized studies found highly effective for relieving **menstrual cramps**.<sup>3</sup>



1. Chen L, et al. The efficacy of ginger for the treatment of migraine: a meta-analysis of randomized controlled studies. *Am J Emerg Med*. 2021;46:567-571
2. ACOG Practice Bulletin 189: January 2018
3. Chen CX et al. Efficacy of Oral Ginger (*Zingiber officinale*) for Dysmenorrhea: A Systematic Review and Meta-Analysis. *Evid Based Complement Alternat Med*. 2016; 6295737.

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#### Supplement Facts

Serving Size 1 Cup Brewed Tea Servings Per Container 16

	Amount Per Serving	%DV
Calories	0	
<b>All Herbal Ingredients:</b>		
Organic ginger rhizome** [JP]**	1500 mg	†

† Daily Value (DV) not established.

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Certified by the California Certified Organic Farmers (CCOF)

All Ingredients Certified Organic

\*\*100% Fair Trade Certified™ ingredients by dry weight. [www.fairtradeusa.org](http://www.fairtradeusa.org)



Consult a healthcare practitioner prior to use if you have gallstones, or if you are pregnant or breastfeeding.



**Note: no financial relationship with product. Example only.**

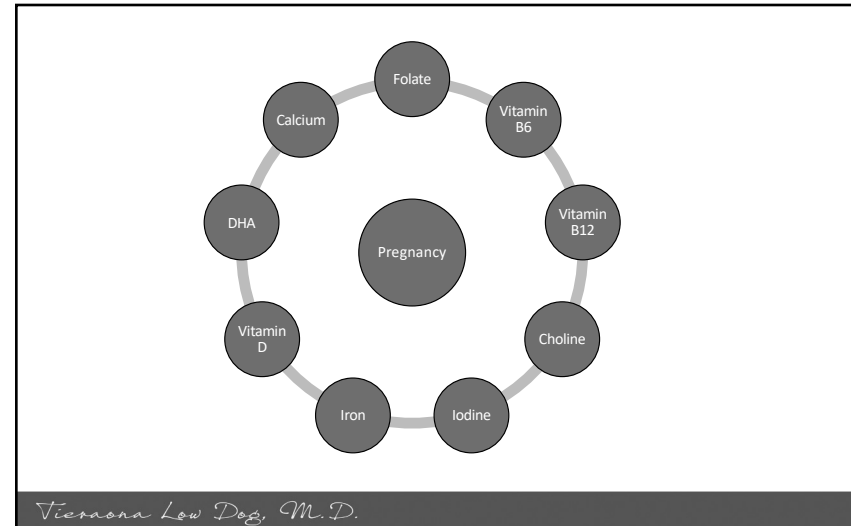
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## Folate/Folic Acid



- New RDA pregnancy: **360 mcg folic acid/d (600 mcg DFE)**.
- USPSTF recommends all women planning or capable of pregnancy take 400–800 µg per day **of folic acid**.<sup>1</sup> (*This recommendation currently under review*)
- Society of Obstetricians and Gynecologists Canada 2022: “Health care providers should advise all women aged 12–45 years considering or planning a pregnancy about the benefits of taking an **oral daily multivitamin containing folic acid (0.4–1.0 mg)** to optimize serum and red blood cell folate levels.” (evidence: *strong, high*).<sup>2</sup>

1. <https://www.uspreventiveservicestaskforce.org/uspsf/recommendation/folic-acid-for-the-prevention-of-neural-tube-defects-preventive-medication>. Accessed November 23, 2022. 2. Wilson RD, O'Connor DL. *JOGC* 2022; 44(6):707-719

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## Choline in Pregnancy




- ACOG, AMA, AAP, EFSA, WHO: all conclude that choline is **crucially important** during pregnancy.<sup>1</sup>
- **Pregnant women: 450 mg/d, lactating women: 550 mg/d.**
- ~90–95% pregnant women consume less than recommended amounts of choline.
- Review 38 animal & 16 human studies: supplementing mother/child's diet first 1,000 days of life:
  - **Supports normal brain development**
  - Protects against **neural/metabolic insults**, particularly when **fetus exposed to alcohol**.<sup>2</sup>
  - Improves **neural and cognitive functioning**.<sup>3</sup>

1. Schwarzenberg SJ. *Pediatrics*. 2018;141. doi: 10.1542/peds.2017-3716. 2. Derbyshire E, et al. *Nutrients* 2020 Jun 10;12(6):1731. 3. Brunst KJ, et al. *BMJ* 2010 May 20;340:c2181.

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Food	Choline Content Per Serving	Milligrams (mg) per serving	Percent DV*
Beef liver, pan fried, 3 ounces		356	65
Egg, hard boiled, 1 large egg		147	27
Beef top round, separable lean only, braised, 3 ounces		117	21
Soybeans, roasted, ½ cup		107	19
Chicken breast, roasted, 3 ounces		72	13
Beef, ground, 93% lean meat, broiled, 3 ounces		72	13
Fish, cod, Atlantic, cooked, dry heat, 3 ounces		71	13
Potatoes, red, baked, flesh and skin, 1 large potato		57	10
Wheat germ, toasted, 1 ounce		51	9
Beans, kidney, canned, ½ cup		45	8
Quinoa, cooked, 1 cup		43	8
Milk, 1% fat, 1 cup		43	8
Yogurt, vanilla, nonfat, 1 cup		38	7
Brussels sprouts, boiled, ½ cup		32	6
Broccoli, chopped, boiled, drained, ½ cup		31	6
Mushrooms, shiitake, cooked, ½ cup pieces		27	5
Cottage cheese, nonfat, 1 cup		26	5



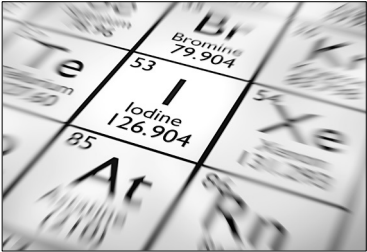
<https://ods.od.nih.gov/factsheets/Choline-HealthProfessional/#en16> Accessed July 17, 2021

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## Iodine in Pregnancy & Lactation

- **Crucial nutrient**, especially during **pregnancy, infancy, and childhood** when thyroid hormones regulate growth in developing brain.
- **Mild deficiency** associated with **autistic spectrum disorder, ADHD, learning disabilities, and dyslexia**.<sup>1</sup>
- Women in US (20–39 yrs) have median urine iodine concentrations **borderline insufficient**.<sup>2</sup>
- **American Thyroid Association:** women planning on becoming pregnant, are pregnant or lactating, **take supplement containing 150 mcg/d potassium iodide**.<sup>3</sup>



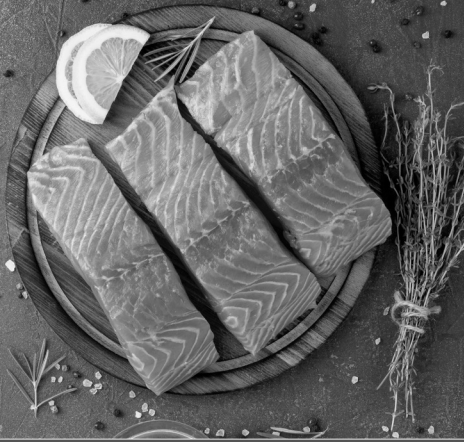
1. Hay I, et al. *Nutrients* 2019 Aug 22;11(9):1974
2. Pfeiffer CM, et al. *J Nutr* 2013; 143(6): DOI:10.3945/jn.112.172858
3. Stagnaro-Green A, et al. *Thyroid*. 2011;21(10):1081-1125

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## Benefits of EPA and DHA

- **Crucial for brain/eye development** of baby first 1,000 days of life
- **Lower triglycerides**
- **Modest reductions in blood pressure**
- **Reduces inflammation**
- **Supports cardiovascular health**
- **May improve cognitive function, depression, and ADHD**



Mohan D, et al. *JAMA Intern Med* 2021 May 1;181(5):631-649.

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## Docosahexaenoic Acid (DHA)

- Cochrane analysis: high quality evidence **preterm birth < 37 weeks** and **early preterm birth < 34 weeks** reduced in women receiving omega-3 LCPUFA compared with no omega-3. Moderate evidence of **reduced perinatal death**.<sup>1</sup>
- Analysis of 2003–2012 NHANES data for 788 pregnant women in the US found daily consumption approximately **66 mg DHA and 34 mg EPA**.<sup>2</sup>
- Recommendation pregnant/breastfeeding women: consume **8-12 ounces** low-mercury **seafood** per week. Many global scientific/expert committees recommend **200 mg/d DHA**.<sup>3</sup> **Algal-derived** supplements are available for vegetarians/vegans.

1. Middleton P et al. *Cochrane Database Syst Rev* 2018 Nov 15;11(11):CD003402.
2. Nordgren TM, et al. *Nutrients*. 2017;9(3):197. doi: 10.3390/nu9030197
3. GOED Global Recommendations for EPA and DHA Intake. [https://www.isfai.org/assets/globalrecommendationsummary12may2014landscape\\_3.pdf](https://www.isfai.org/assets/globalrecommendationsummary12may2014landscape_3.pdf) Accessed November 11, 2022

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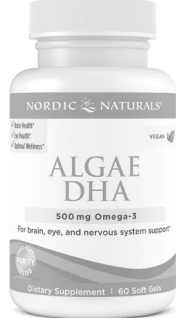


**Supplement Facts**  
Serving Size 1 Teaspoon (5 mL)

	Amount Per Serving	%DV
Calories	40	
Total Fat	4.5 g	9% <sup>**</sup>
Saturated Fat	1 g	5% <sup>**</sup>
Cholesterol	20 mg	7%
Vitamin E (as d-alpha-tocopherol)	6.7 mg	45%
Norwegian Fish Oil	4.6 g	†
Total Omega-3 Fatty Acids*	1,600 mg	†
EPA (Eicosapentaenoic Acid)†	800 mg	†
DHA (Docosahexaenoic Acid)†	800 mg	†

\*Percent Daily Values are based on a 2,000 calorie diet. †Daily Value (DV) not established. \*\*Reported as triglycerides.

500 mg DHA per 2 soft gels



Note: no financial relationship with product. Example only.

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**What is a serving?** As a guide, use the palm of your hand.

**Pregnancy and breastfeeding:**  
1 serving is 4 ounces

**Eat 2 to 3 servings a week from the "Best Choices" list**  
(OR 1 serving from the "Good Choices" list).

**Childhood:**  
On average, a serving is about:

1 ounce at age 1 to 3  
2 ounces at age 4 to 7  
3 ounces at age 8 to 10  
4 ounces at age 11

**Eat 2 servings a week from the "Best Choices" list.**

**Best Choices**

Anchovy	Herring	Scallop
Atlantic croaker	Lobster,	Shad
Atlantic mackerel	American and spiny	Shrimp
Black sea bass	Mullet	Skate
Butterfish	Oyster	Smelt
Catfish	Pacific chub	Sole
Clam	mackerel	Squid
Cod	Perch, freshwater	Tilapia
Crab	and ocean	Trout, freshwater
Crawfish	Pickering	Tuna, canned light
Flounder	Plaice	(includes skipjack)
Haddock	Pollock	Whitefish
Hake	Salmon	Whiting
	Sardine	

**Good Choices**


Bluefish	Monkfish	Tilefish
Buffalofish	Rockfish	(Atlantic Ocean)
Carp	Sablefish	Tuna, albacore/
Chilean sea bass/	Sheepshead	white tuna, canned
Patagonian toothfish	Snapper	and fresh/frozen
Groupers	Spanish mackerel	Tuna, yellowfin
Halibut	Striped bass (ocean)	Weakfish/seatrout
Mahi mahi/dolphinfish		White croaker/
		Pacific croaker


**Choices to Avoid** HIGHEST MERCURY LEVELS

King mackerel	Shark	Tilefish
Marlin	Swordfish	(Gulf of Mexico)
Orange roughy		Tuna, bigeye

**What about fish caught by family or friends?** Check for fish and shellfish advisories to tell you how often you can safely eat those fish. If there is no advisory, eat only one serving and no other fish that week. Some fish caught by family and friends, such as larger carp, catfish, trout and perch, are more likely to have fish advisories due to mercury or other contaminants.

[www.FDA.gov/fishadvice](http://www.FDA.gov/fishadvice)  
[www.FDA.gov/fishadvice](http://www.FDA.gov/fishadvice)


 U.S. FOOD & DRUG  
 ADMINISTRATION

 EPA  
 United States  
 Environmental Protection  
 Agency

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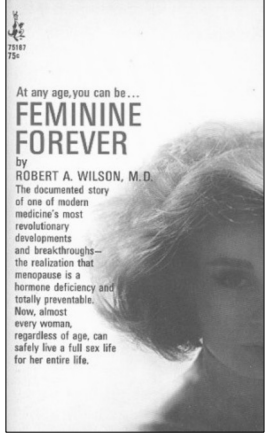
## Reduce Environmental Exposures

1. Eat **fresh** rather than processed food when possible
2. **Organic** fruits/vegetables, dairy; **grass fed/finished** meats, **free range eggs**, when possible
3. Reduce consumption of foods/beverages in cans and plastic containers (avoid recycling #3 and #7)
4. Do not heat or store foods in plastic
5. Minimize use of personal care products containing **fragrances** ([skindeep.org](http://skindeep.org))
6. Avoid garden/household/pet pesticides or fungicides. Use **integrated pest management** for home/yard
7. Use **water** filtration system ([ewgs-water-filter-buying-guide](http://ewgs-water-filter-buying-guide)), consider **HEPA** filters in home



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- Medicalization of women's health is widespread.
- Menopause medicalized since 1930s as a "deficiency disease," hormone replacement therapy recommended.
- Keeping women "feminine forever" was the claim, along with the promise of preventing heart disease, osteoporosis, and memory loss.
- Estrogen became one of the most frequently prescribed drugs in the U.S.

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### **Three benchmark stages of natural menopause:**

1. Perimenopause (or the menopause transition) is the span of time between the start of symptoms (such as erratic periods) and 1 year after the final menstrual period.
2. Menopause is confirmed 1 year (12 months) after the final menstrual period.
3. Post-menopause is *all the years* beyond menopause.

### **Symptoms can start up to 10 years prior**

- Hot flashes
- Sleep disturbances
- Vaginal dryness
- Mood changes
- Difficulty concentrating
- Memory impairment
- Bladder irritability/urgency
- Changes in balance
- Decreased interest in sex, decreased response to sexual stimulation



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## *Hormone Therapy (HT)*

- HT most effective treatment for **vasomotor symptoms (VMS)** and **genitourinary syndrome of menopause (GSM)**.
- Risks of HT differ depending on **type, dose, duration of use, route of administration, timing of initiation, and progestogen**.
- **Women <60 years or within 10 years of menopause onset** without contraindications: benefit-risk ratio most favorable for **treatment of VMS and those at higher risk for bone loss or fracture**.
- **Women >60 years or who initiate HT >10 years from menopause onset**: benefit-risk ratio less favorable because of greater **absolute risks of coronary heart disease, stroke, blood clots, and dementia**.

Practice Guideline: *Menopause* 2017 Jul;24(7):728-753

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Table 1. Estimated Event Rate Difference Associated With Combined Estrogen and Progestin Use vs Placebo in Postmenopausal Women

Outcome	Absolute Event Rate Difference per 10 000 Woman-Years (95% CI)
<b>Harms</b>	
Breast cancer (invasive)	9 (1 to 19)
Coronary heart disease	8 (0 to 18)
Dementia (probable) <sup>a</sup>	22 (4 to 53)
Gallbladder disease	21 (10 to 34)
Stroke	9 (2 to 19)
Venous thromboembolism <sup>b</sup>	21 (12 to 33)
Urinary incontinence	876 (606 to 1168)
<b>Benefits</b>	
Diabetes	-14 (-24 to -3)
All fractures	-44 (-71 to -13)
Colorectal cancer	-6 (-9 to -1)

<sup>a</sup> Women aged 65 years and older.

<sup>b</sup> Includes deep vein thrombosis and pulmonary embolism.

Table 2. Estimated Event Rate Difference Associated With Estrogen Use Alone vs Placebo in Postmenopausal Women

Outcome	Absolute Event Rate Difference per 10 000 Woman-Years (95% CI)
<b>Harms</b>	
Dementia (probable) <sup>a</sup>	12 (-4 to 41)
Gallbladder disease	30 (16 to 48)
Stroke	11 (2 to 23)
Venous thromboembolism <sup>b</sup>	11 (3 to 22)
Urinary incontinence	1261 (880 to 1689)
<b>Benefits</b>	
Breast cancer (invasive)	-7 (-14 to 0.4)
All fractures	-53 (-69 to -39)
Diabetes	-19 (-34 to -3)

<sup>a</sup> Women aged 65 years and older.

<sup>b</sup> Includes deep vein thrombosis and pulmonary embolism.

**Hormone Therapy for the Primary Prevention of Chronic Conditions in Postmenopausal Women** US Preventive Services Task Force Recommendation Statement. *JAMA*. 2017;318(22):2224-2233.

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### *Hormone Route and Type*

- **Transdermal estrogen LEAST** likely to cause blood clots.<sup>1</sup>
- HT associated with increased risk of breast cancer; risk predominantly mediated by synthetic progestins. Micronized progesterone safer to use.<sup>2</sup>
- If symptoms primarily **urinary and/or vaginal, vaginal estrogen should be used (has minimal systemic absorption).**<sup>3</sup>
- ACOG: there is no biologically meaningful relationship between **salivary** sex hormone concentrations and **free serum hormone** levels. Salivary hormone levels **vary with diet, time of day, and other variables.**

1. Sobel TH, Shen W. *Menopause* 2022 Jan 14;29(4):483-490.

2. Abenhaim HA, et al. *Obstet Gynecol* 2022 Jun 1;139(6):1103-1110.

3. Practice Guideline: *Menopause* 2017 Jul;24(7):728-753

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### *Bio-identical Hormones*



- Compounded bioidentical hormones are not FDA regulated (not tested for purity, potency, efficacy, safety)
  - No official labeling, exempt from including FDA warnings
- FDA-approved prescription hormones containing bioidentical hormones
 

• Estrace (vaginal and oral)	Climara
• Estraderm	Estragel
• Estrasorb	Estring
• Femring	Vagifem
• Prometrium (micronized progesterone)	

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### *Vaginal Moisturizers and Lubricants*

- Moisturizers (used regularly)
  - Replens—2 studies in breast cancer survivors, highly effective
  - Moist Again
  - K-Y Liqui-beads and K-Y Silk-E
- Lubricants (used during intercourse)
  - Pre-Seed—best tolerated
  - Slippery Stuff Gel (formerly Femglide)—hypo-osmotic (water-based)
  - K-Y Yours + Mine
  - YES (derived from flax extract, guar, locust bean, xanthan gum)
  - Astroglide—hyperosmotic, may cause irritation

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### *Soy and Breast Cancer*

- **European Food Safety Authority** concluded **after a multi-year investigation** that in **postmenopausal women, soy isoflavones *do not* adversely affect the breast, thyroid, or uterus.**
- **North American Menopause Society** concluded that **soy isoflavones *do not* increase risk of breast or endometrial cancer.**
- **American Cancer Society** and **American Institute for Cancer Research** confirm **soy foods** can be **safely** consumed by women with **breast cancer.**

Panel on Food Additives and Nutrient Sources added to Food Scientific opinion on the risk assessment for peri- and post-menopausal women taking food supplements containing isolated isoflavones. *EFSA J.* 2015;13:4246.

Messina M. *Nutrients* 2016; 8(12): 754

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## Research & Traditional Use



- **Soy isoflavones** may reduce severity and frequency of hot flashes
- **Black cohosh** not traditionally used for menopause; studies mixed
- **St John's wort** for hot flashes, moodiness, etc.\*
- **Maca** for low libido and mood.
- **Saffron** for low libido and mood.
- Consider adaptogens (e.g., ashwagandha, bacopa, rhodiola)

\*Note: watch for drug interactions

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Table 2. Prevalence of Micronutrient Inadequacies Among Older Adults in the US when Accounting for Intake from Food Only (n=4,905), NHANES 2009-2012 (42)

Micronutrient	Ages 51-70 Years, % < EAR	Ages ≥71 Years, % < EAR
Folate	10.6	17.0
Niacin	1.3	4.0
Riboflavin	2.6	3.4
Thiamin	6.0	8.9
Vitamin A	39.2	37.2
Vitamin B <sub>6</sub>	15.6	22.4
Vitamin B <sub>12</sub>	5.2	4.9
Vitamin C	42.1	44.2
Vitamin D	94.6	95.5
Vitamin E	85.0	91.7
Vitamin K*	48.7	62.9
Calcium	51.4	72.9
Copper	4.1	9.6
Iron	<1	<1
Magnesium	51.3	68.6
Phosphorus	<1	2.1
Selenium	<1	2.4
Zinc	17.9	26.1

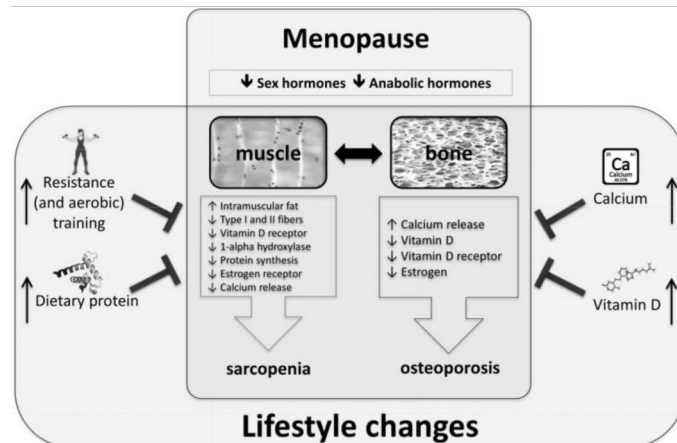
\*% ≤ AI

Women > 50 years should take a good multivitamin, with emphasis on vitamins B6, B12, D, E, K; as well as calcium and magnesium.

Table from:  
<https://pi.orconstate.edu/mi/micronutrient-inadequacies/subpopulations-at-risk>. Accessed Sept 1, 2021

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From: Agostini D, et al. *Nutrients* 2018 Aug; 10(8): 1103.

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## How Much Protein?



- ~0.8 g/kg body weight for adults
  - (Multiply weight in lb. x 0.36)
  - 150 pounds = 55 g/d
  - 180 pounds = 65 g/d
- 1.0–1.2 g/kg for those over age 60\*
  - 150 pounds = 69–81 grams
  - 180 pounds = 81–98 grams
- 1.2–1.5 g/kg competitive athletes

\*Not for those with kidney disease.

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### Fast Facts on Calcium

- Most **abundant mineral** in body. Comprises most of **bone and tooth** structure; supports **blood vessel contraction/dilation, muscle contraction, blood clotting, nerve transmission**, etc.
- **Absorption** of dietary calcium: **~60% in infants/children**, decreases to **~25% in adults**, and continues to **decline with age**.
- **Deficiency** can lead to osteoporosis (low vitamin D levels, more Ca needed to maintain bone health); symptoms: **dry skin, muscle cramps, fatigue**, etc.
- Calcium content in **kale family** (broccoli, bok choy, cabbage, mustard, turnip greens) is as **bioavailable as in milk**.
- **Don't take within 3 hours**: antibiotics, thyroid meds, bisphosphonates.

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### Calcium

Table 2: Calcium Content of Selected Foods [12]

Food*	Milligrams (mg) per serving	Percent DV*
Yogurt, plain, low fat, 8 ounces	415	32
Orange juice, calcium fortified, 1 cup	349	27
Yogurt, fruit, low fat, 8 ounces	344	27
Mozzarella, part skim, 1.5 ounces	333	26
Sardines, canned in oil, with bones, 3 ounces	325	25
Milk, nonfat, 1 cup**	299	23
Soy milk, calcium fortified, 1 cup	299	23
Milk, whole (3.25% milk fat), 1 cup**	276	21
Tofu, firm, made with calcium sulfate, ½ cup***	253	19
Salmon, pink, canned, solids with bones, 3 ounces	181	14
Cottage cheese, 1% milk fat, 1 cup	138	11
Tofu, soft, made with calcium sulfate, ½ cup***	138	11
Soybeans, cooked, ½ cup	131	10
Breakfast cereals, fortified with 10% of the DV for calcium, 1 serving	130	10
Spinach, boiled, drained, ½ cup	123	9
Frozen yogurt, vanilla, soft serve, ½ cup	103	8
Turnip greens, fresh, boiled, ½ cup	99	8
Kale, fresh, cooked, 1 cup	94	7
Chia seeds, 1 tablespoon	76	6
Chinese cabbage (bok choy), raw, shredded, 1 cup	74	6
Beans, pinto, canned, drained, ½ cup	54	4
Tortilla, corn, one, 6" diameter	46	4

Age	Male	Female	Pregnant	Lactating
0-6 months*	200 mg	200 mg		
7-12 months*	260 mg	260 mg		
1-3 years	700 mg	700 mg		
4-8 years	1,000 mg	1,000 mg		
9-13 years	1,300 mg	1,300 mg		
14-18 years	1,300 mg	1,300 mg	1,300 mg	1,300 mg
19-50 years	1,000 mg	1,000 mg	1,000 mg	1,000 mg
51-70 years	1,000 mg	1,200 mg		
>70+ years	1,200 mg	1,200 mg		

\*Adequate Intake (AI)  
Source for both images: (accessed 5/31/22)  
ods.od.nih.gov/factsheets/Calcium-HealthProfessional/#h4

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### Vitamin D & Musculoskeletal Health

- Deficiency can cause **rickets in children; osteomalacia in adults** leading to **musculoskeletal pain** in the pelvis, shoulders, low back, and proximal muscles.
- In addition to its crucial role in **bone health**, vitamin D has been shown to **positively affect muscle strength, muscle size, and neuromuscular performance**.



Wintermeyer E, et al. Crucial Role of Vitamin D in the Musculoskeletal System. *Nutrients* 2016; Jun 18(6): pii: E319.

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### Vitamin D & Respiratory Infection



Martineau AR, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ* 2017; 356: i6583.

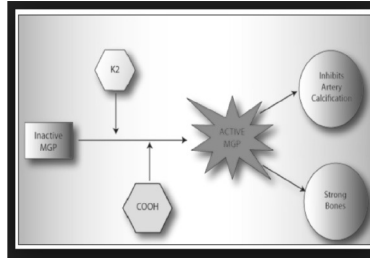
- Acute respiratory infection kills **~2.65 million people/year**.
- **25 eligible randomized controlled trials (n=10,933, aged 0-95 years)**.
- Vitamin D supplementation **reduced risk of acute respiratory infection** among all participants (NNT=33), and those who were **vitamin D deficient** experienced the most benefit (NNT=4).

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## Don't Forget the Vitamin K

- Calcium, vitamins D and K, and magnesium contribute independently and collectively to bones.
- Beneficial role of vitamin K, particularly **vitamin K2**, in **bone and cardiovascular health** is *reasonably* well supported scientifically, with preclinical, epidemiological, and clinical studies published over the last decade.
- **Vitamin K2 (MK-7) 100–200 mcg per day.**



Karpinski M, et al. Roles of Vitamins D and K, Nutrition, and Lifestyle in Low-Energy Bone Fractures in Children and Young Adults. *J Am Coll Nutr* 2017 Jul;36(5):399-412.

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Table 2. IOM and Endocrine Society Recommendations for Vitamin D Intake<sup>8,11</sup>

Life-stage Group <sup>a</sup>	IOM Recommendations, IU/d		Endocrine Society Recommendations, IU/d <sup>b</sup>	
	Intake	Upper Limit <sup>c</sup>	Intake	Upper Limit <sup>c</sup>
0-6 months	400 <sup>d</sup>	1,000	400-1,000	2,000
6-12 months	400 <sup>d</sup>	1,500	400-1,000	2,000
1-3 years	600	2,500	600-1,000	4,000
4-8 years	600	3,000	600-1,000	4,000
9-18 years	600	4,000	600-1,000	4,000
19-30 years	600	4,000	1,500-2,000	10,000
31-50 years	600	4,000	1,500-2,000	10,000
51-70 years	600	4,000	1,500-2,000	10,000
71+ years	800	4,000	1,500-2,000	10,000
Pregnant or lactating women (14-18 years)	600	4,000	600-1,000	4,000
Pregnant or lactating women (19-50 years)	600	4,000	1,500-2,000	10,000

<sup>a</sup> Includes normal healthy individuals of both genders unless otherwise specified.

<sup>b</sup> Estimated intake needed to maintain blood 25(OH)D levels above 30 ng/mL.

<sup>c</sup> Maximum level that is expected to have no risk of adverse effects to healthy individuals. 1 µg of vitamin D is equivalent to 400 IU.

<sup>d</sup> Refers to adequate intake (intake estimated to maintain protective 25(OH)D levels in a group of healthy individuals with limited sun exposure and vitamin D stores) instead of recommended intake, which could not be established because of insufficient evidence.

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## Cranberry for Recurrent UTI



Supplement Facts	
Serving Size: 1 capsule Servings Per Container: 30	
Amount Per Capsule	% Daily Value
Urophenol™ - 240 mg	†
Cranberry (125:1)	†
(Vaccinium macrocarpon) fruit extract providing 15% proanthocyanidins (PACs) = 36 mg PAC per DMAC/A2	

- **American Urological Association:** “Clinicians may offer cranberry prophylaxis for women with rUTIs.”
- **Only non-antibiotic prophylaxis** the AUA Guideline recommends.
- Products should provide **minimum 36 mg/d PAC**—this is *amount* required to promote **bacterial anti-adhesion activity and UTI prevention**.

Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline (2019) [www.auanet.org/guidelines/recurrent-uti](http://www.auanet.org/guidelines/recurrent-uti) Accessed 1/13/23

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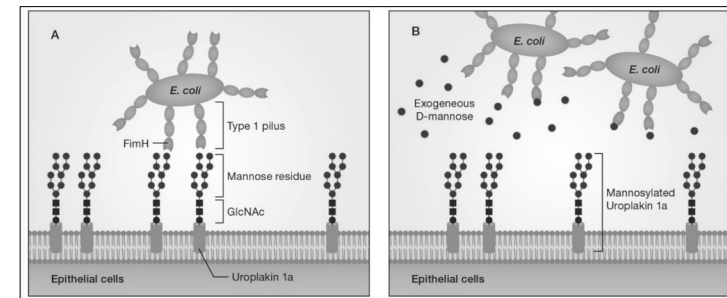


Image from: *Antibiotics* 2022, 11(3), 314; <https://doi.org/10.3390/antibiotics11030314>

Viernona Low Dog, M.D.

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## D-mannose for Recurrent UTI



- After antibiotic treatment for acute cystitis, **308 women with history of recurrent UTI randomized to one of three groups:**
  - **2 g/d mannose powder in 200 ml water**
  - **50 mg/d nitrofurantoin**
  - **No prophylaxis**
- **~15% recurrence in D-mannose, 20% in nitrofurantoin and 61% no treatment group.<sup>1</sup>**
- **2020 Systematic Review:** D-mannose **protective for recurrent UTI** (vs placebo) with possibly **similar effectiveness as antibiotics**. Overall, D-mannose appears **well tolerated** with minimal side effects—only a small percentage experiencing diarrhea.<sup>2</sup>

1. Kranjčec B, et al. D-mannose powder for prophylaxis of recurrent urinary tract infections in women: a randomized clinical trial *World J Urol* 2014; 32(1):79-84

2. Lengua SM, et al. D-mannose vs other agents for recurrent urinary tract infection prevention in adult women: a systematic review and meta-analysis. *Am J Obstetric Gynecology* 2020; 223(2): August 2020, Pages 265.e1-265.e13

*Vierraona Low Dog, M.D.*

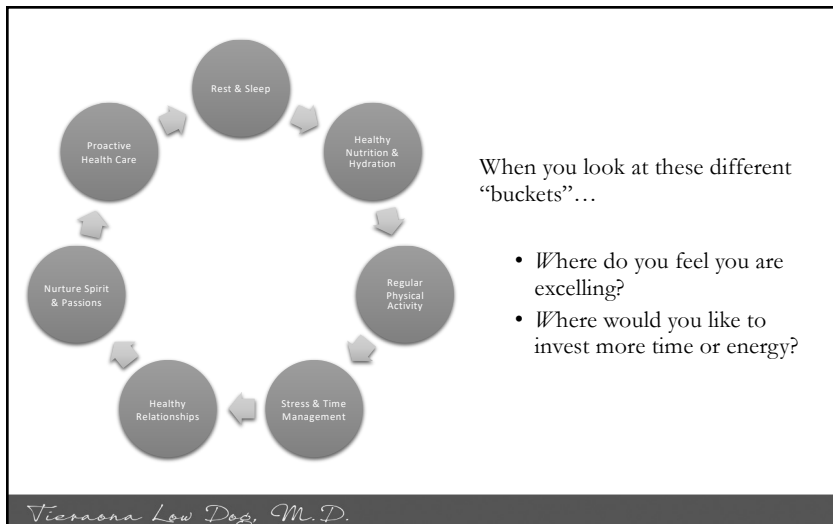
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Supplement Facts		
Serving Size: 1 Level Teaspoon (approx. 2 g)		
Servings Per Container: about 43		
	Amount Per Serving	% Daily Value
Calories	10	
Total Carbohydrate	2 g	<1%*
Total Sugars	2 g	†
Organic D-Mannose	2 g (2,000 mg)	

Supplement Facts		
Serving Size: Four (4) Capsules		
Servings Per Container: 30		
	Amount Per Serving	% Daily Value
Calories	10	
Total Carbohydrate	2 g	<1%*
Total Sugars	2 g	†
Incl. 2 g Added Sugars		4%*
D-Mannose	2,000 mg	†

*Vierraona Low Dog, M.D.*

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- Women's health is a state of well-being in which a woman feels creative, strong and wise.
- Her innate healing power is vital and intact.
- She feels valued and heard.
- She is free to choose and decide; she honors her own rhythms and journey.

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