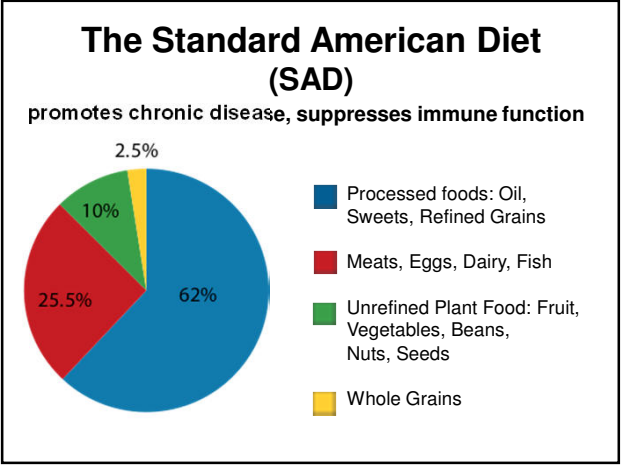


**Combating Obesity and Treating Disease
with a High Nutrient Diet**

Joel Fuhrman, M.D.

- Lecture Outline**
1. What is a nutritarian diet ?
 2. Maximizing cardiac and diabetic reversal using beans, nuts and seeds
 3. Diabetic case series study, and interesting histories
 4. Potential problems with low fat vegan diet
 5. Conservative use of nutritional supplements to prevent and treat depression and prevent later life dementia.



Optimizing Micronutrient Intake

Modest micronutrient insufficiency is ubiquitous and can lead to DNA damage, mitochondrial decay and telomere decay.

Almost all Americans (both vegetarians and meatatarians) are micronutrient insufficient, especially those derived from green vegetables.

Dr. Fuhrman's Health Equation

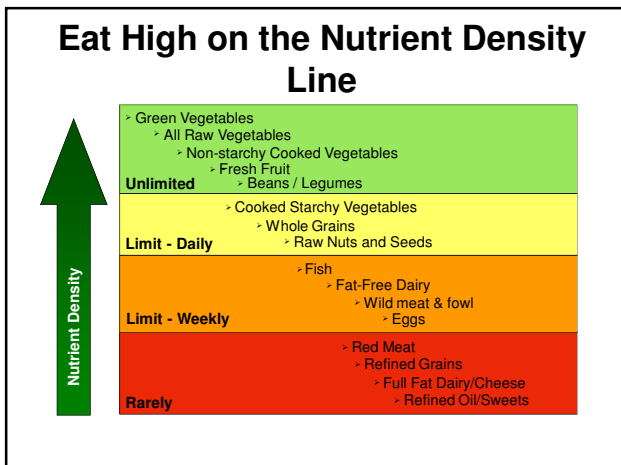
- In physics a key formula is $E = mc^2$.
- In nutritional science the key formula is my health equation:

$$H = N / C$$

Health Expectancy = Nutrients / Calories

ANDI Scores

Mustard Greens	1000	Grapes	119	Salmon	34
Watercress	1000	Pomegranates	119	Eggs	34
Kale	1000	Cantaloupe	118	Milk, 1 %	31
Turnip Greens	1000	Onions	107	Walnuts	30
Collard Greens	1000	Flax Seeds	103	Whole Wheat Bread	30
Bok Choy	864	Orange	98	Almonds	28
Spinach	707	Edamame	98	Avocado	28
Arugula	604	Cucumber	87	Brown Rice	28
Romaine	510	Tofu	82	White Potato	28
Brussels Sprouts	490	Sesame Seeds	76	Low Fat Plain Yogurt	28
Cabbage	434	Lentils	72	Cashews	27
Carrots	384	Sunflower Seeds	65	Oatmeal	26
Broccoli	294	Peaches	65	Chicken Breast	24
Cauliflower	294	Kidney Beans	64	Ground Beef, 85% lean	21
Bell Peppers	207	Green Peas	63	White Bread	17
Asparagus	205	Cherries	55	White Pasta	16
Mushrooms	199	Pineapple	54	Cheddar Cheese	11
Tomato	186	Apple	53	Potato Chips	11
Strawberries	182	Mango	53	French Fries	11
Sweet Potato	181	Corn	45	Olive Oil	10
Artichoke	145	Pistachio Nuts	37	Vanilla Ice Cream	8
Blueberries	132	Shrimp	36	Cola	0.9
Iceberg Lettuce	127				



Insulin-like Growth Factor – 1 (IGF-1) Low Levels Extend Life Span

- Decreased inflammation
- Reduced oxidative damage
- Stress resistance
- Insulin sensitivity
- Slows aging of the brain

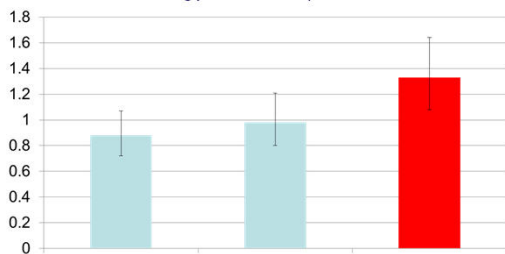
Glycemic Load and Chronic Disease

- Diabetes
- Heart disease and stroke
- Multiple cancers
- Age-related macular degeneration
- Gallbladder disease
- Overall chronic disease

Glycemic Load and Cancer

- Meta-analysis of 39 studies: GL and GI associated with increased risk of colorectal and endometrial cancers
- Meta-analysis of 10 prospective studies: GI associated with increased breast cancer risk
- In a study of Korean women:
 - White rice increased breast cancer risk (19% increase in risk per 100 g per day)
 - Wild brown/black rice decreased breast cancer risk (24% decrease per 100 g per day)

Danger of High Glycemic Index Diets (Effect of replacement of 5% energy from SFA with 5% energy from carb)



Outcome	Replace 5% of energy from SFA with		
	Low-GI	Medium-GI	High-GI
Myocardial Infarction	0.88 (0.72, 1.07)	0.98 (0.80, 1.21)	1.33 (1.08, 1.64)

Jakobsen MU, Dethlefsen C, Joensen AM et al., Am J Clin Nutr 2010;91:1764-8

Food	Glycemic Load
White potato	29
White rice	26
White pasta	21
Chocolate cake	20
Corn	18
Sweet potato	14
Grapes	14
Rolled oats	13
Whole wheat	11
Mango	11

Food	Glycemic Load
Lentils	9
Apples	9
Kiwi	8
Green peas	8
Butternut squash	8
Kidney beans	7
Black beans	6
Watermelon	6
Oranges	4
Cashews	2
Strawberries	1

Eat more Greens and Beans

	Resistant Starch %	Resistant Starch % + Fiber %
Black Beans	27	70
Navy Beans	26	62
Lentils	25	59
Split Peas	25	58
Corn	25	45
Brown Rice	15	20
Rolled Oats	7	17
Whole Wheat Flour	2	14
Pasta	3	9
Potato	3	5

What is a Nutritarian Diet-Style ?

- A diet with a high nutrient per calorie ratio
- A diet that strives to be nutritionally comprehensive avoid potential insufficiencies
- A diet style that strives to be hormonally favorable by minimizing or avoiding foods that promote unfavorable hormone status.
- Recognizes individual differences in nutrient needs, requiring supplementation or dietary modification to maximize disease-free mortality.

3 Irrefutable Facts

1. Vegetables, beans, seeds, nuts, fruits, are good for you.
2. Excessive amount of animal products cause disease.
3. Refined carbohydrates cause disease and lead to overweight and obesity

Studies on Potato Consumption

- ↑ Increased risk of diabetes, especially in obese women (1 serving/day: 18% increase)
- ↑ Increased risk of rectal cancer (3.3 servings/week compared to 1.3: 57% increase in risk)
- ↑ Associated with increased weight gain

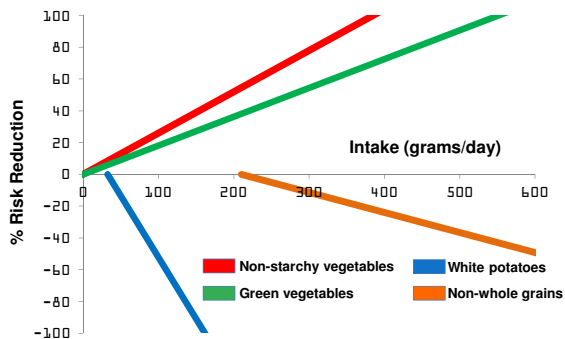
Halton TL, Willett WC, Liu S, et al., Potato and French fry consumption and risk of type 2 diabetes in women. *Am J Clin Nutr* 2006;83(2):284-90. Williams CD, Satia JA, Adair LS, et al. Dietary patterns, food groups, and rectal cancer risk in Whites and African-Americans. *Cancer Epidemiol Biomarkers Prev*. 2009 May;18(5):1552-61. Mozaffarian D, Hao T, Rimm EB, et al. Changes in diet and lifestyle and long-term weight gain in women and men. *N Engl J Med*. 2011 Jun 23;364(25):2392-404.

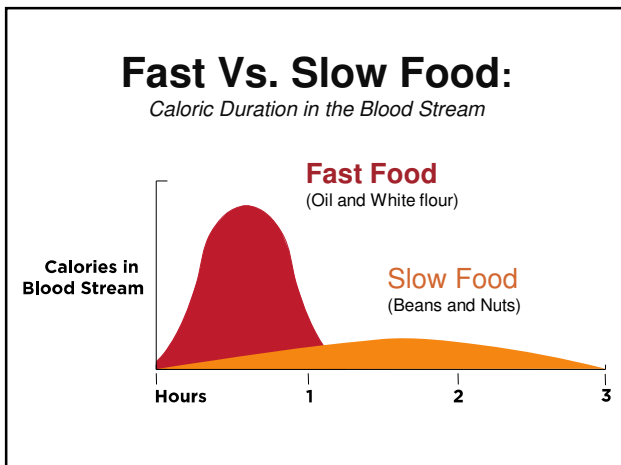
Potatoes and Diabetes: Nurses' Health Study

- Primary factor that drove the association between potatoes and diabetes was glycemic load (GL), not added fats
- Substituting 1 serving potatoes/day for 1 serving whole grain/day increased diabetes risk by 30%

Halton TL, Willett WC, Liu S, et al. Potato and French fry consumption and risk of type 2 diabetes in women. *Am J Clin Nutr*. 2006 Feb;83(2):284-90.

Non-starchy and Green Vegetables are Protective; White Potatoes and Non-whole Grains Increase Risk





Beans and Longevity

- **8 % reduction in death, for each 20 grams (2 tbsp) beans**
- **No other food so significantly predictive of survival**

inositol pentakisphosphate – (IP-5)
 → **will not allow tumors to grow**
 Beans twice a week, 50 % reduction in colon cancer

Legumes: the most important dietary predictor of survival in older people of different ethnicities. Asia Pac J Clin Nutr. 2004;13(2):217-20.

Beans and the Second-Meal Effect

- Beans lower the glycemic load of the meal by blunting the absorption of glucose from other foods in the small intestine.
- Propionate produced by bean-fed bacteria slows gastric emptying and this effect continues later, even the next day when beans are not eaten.

Mollard RC et al. First and second meal effect of pulses on blood glucose appetite, and food intake at a later meal. Appl Physiol Nutr Metab 2011;36(5):634-642.

Removing Beans Increases Risk of Animal Products

Phytic acid binds arsenic, mercury, iron and prevents iron-mediated hydroxyl radical.

Augments NK cell activity and induces abnormal cell regression to normal

Inhibits cancer cell migration and invasion

J Singh, P S Basu. Non-Nutritive Bioactive Compounds in Pulses and Their Impact on Human Health: An Overview. Food and Nutrition Sciences 2012 3(NA):1664-1672.

Whole Grains vs. Beans

	Whole grain group	Bean group
Fiber intake (g/1000 calories)	1.9	10
Glycemic load	-5	-48
HbA1C	-0.30	-0.50
Body weight (lb.)	-4.4	-5.7
Fasting glucose (mg/dl)	-7	-9
Triglycerides (mg/dl)	-9	-21
Total cholesterol (mg/dl)	-2	-9
Systolic BP (mm Hg)	0	-4
Diastolic BP (mm Hg)	0	-3

Jenkins DJ, Kendall CW, Augustin LS, et al.: *Arch Intern Med* 2012;1-8.

**More Greens
More Beans
More Nuts and Seeds**

means

Dramatic lowering of glycemic load and diabetic and cardiovascular parameters

Jenkins DJ, et al. Nuts as a replacement for carbohydrate in the diabetic diet. *Diabetes Care* 34:2011

Seeds and Nuts for Weight Loss

- Those who consume nuts regularly tend to have a lower BMI than non-consumers
- More weight loss compared to equal calories of carbohydrate
- Properties of nuts that contribute to weight maintenance:
 - Satiety (accounts for 55-75% of calories)
 - Calories poorly accessible for absorption (15- 20%)
 - Increased resting energy expenditure (10%)
 - Fatty Acid Oxidation decreased with diets too low in fat

Nuts and Seeds and Heart Disease

- A review of 23 interventional trials
- Large drop in LDL cholesterol, especially the most dangerous small dense LDL
- Raise HDL
- Reduce C-reactive protein and plaque adhesion molecules
- Increase arginine
- Restore vascular elasticity

Nuts and Cholesterol Levels

Pooled analysis of 25, 3-8 week trials:

Nuts consumed/day	Decrease in total cholesterol	Decrease in LDL
1 ounce	2.8%	4.2%
1.5 ounces	3.2%	4.9%
2.4 ounces	5.1%	7.4%

Nuts/Seeds Reduce Risk of Coronary Event

The best and largest cohort studies in nutritional epidemiology report that eating nuts/seeds is associated with a 30 – 50 % decreased risk of CAD death. Primarily Sudden Cardiac Death

Benefits are not limited to meat-eating populations but significant lifespan benefits seen in vegans as well. It is also found in the oldest Adventists (over 84).

Polyphenols, sterols, Vit E fragments, nitrous oxide promotes, cancer inhibitors, and enhance micronutrient absorption.

Fraser GE. Nut consumption, lipids, and risk of a coronary event. Asia Pacific J Clin Nutri 2000;9S:S28-S32. Nash SD, et al. Nuts as part of a healthy cardiovascular diet. Currant Atherosclerosis Reports. 2008;10(60):529-535. Albert CM, et al. Nut consumption and decreased risk of sudden cardiac death in the Physicians Health Study. Arch Int Med 2002;162(12):1382-7.

Nuts and Heart Disease

- The Adventist Health Study
- The Iowa Women’s Health Study
- The Nurses Health Study
- The Physicians Health Study
- The CARE Study

**Dramatic reduction in all-cause mortality.
Dramatic effect on increased lifespan.**

Seventh-Day Adventist Study

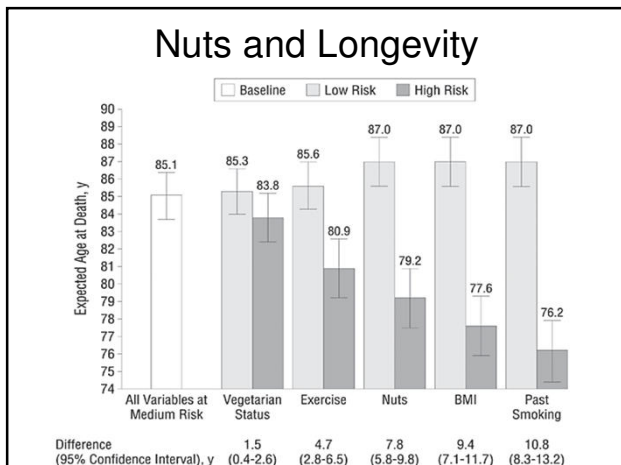
This 12-year study, published in 2001 Archives of Internal Medicine.

Longest life was in:

- ▶ Vegan who ate nuts and seeds
- ▶ Flexitarians who eat nuts and seeds
- ▶ Low fat vegans (no nuts and seeds)

The nut eating non-vegans had a longer lifespan than the nut avoiding vegans. Overall, significant reduction in incidence and death from cancer in vegans and near vegans.

Fraser GE, Shavlik DJ. Ten Years of Life, Is It a Matter of Choice? Arch Intern Med. 2001;161:1645-1652.



Nuts and Seeds High in Omega-3

Walnuts, hemp, chia, flax seeds

Eating nuts and seeds increases stool fat, which means all the fat is not absorbed

EPA and DHA inadequacy -- vegans at risk

Walnut studies

- Enhanced cholesterol efflux
- Increased vessel elasticity and endothelial function
- Decrease LDL, triglycerides, increase HDL, lower particle number, lower serum glucose
- Reduce oxidant load on brain cells and improve interneuronal signaling and neurogenesis. .

Nutritarian vs. Standard Diet

Nutritarian Diet

- Vegetable-based
- Lots of fruit, beans, seeds, nuts
- Oil used sparingly
- Animal products 0-3 times a week
- Focused on nutrient-dense calories

Standard Diet

- Grain based
- Lots of dairy and meat
- Oils supply a major caloric load
- Animal products 2-4 times a day
- Focused on nutrient-poor calories

The Changing Perception of Hunger Study

- 768 participants
- 90 percent of “90 percenters” reported a changed perception of hunger
- Over 500 people reported a loss of the addictive drive to overeat

Fuhrman J, Sarter B, Glaser D, Acocella S. Changing perceptions of hunger on a high nutrient density diet. Nutrition Journal 2010;9:51.

Nutritarian (HND) Diabetes Research Study

1. Only one participant who did not decrease or discontinue all diabetic medications was only on the lowest dose of Metformin.
2. Mean HbA1c 8.2 → 5.8 that is a 2.35 point drop, compared to .56 in the Vegan Diabetic study, which decreased meds by 43 percent.

Dunaief DM, Fuhrman J, Dunaief JL, Ying G. Glycemic and cardiovascular parameters improved in type 2 diabetes with the high nutrient density (HND) diet. Open Journal of Preventive Medicine 2012;3:364-371.

Nutritarian (HND) Diabetes Research Study

- All reduced BMI, half reached normal BMI
- All with hypertriglyceridemia > 200, dropped by more than 100 points
- All hypertensives saw BP reductions with systolic mean of 148 to mean of 121, with simultaneous 67 % reduction in medications

Fuhrman J, Dunaief JL, et al: Glycemic and cardiovascular parameters improved in type 2 diabetes with the high nutrient density (HND) diet. Open Journal of Preventive Medicine 2012;2(3):364-371.

Diabetes Study Summary

	<u>Baseline</u>	<u>HND diet</u>
Participants taking diabetes medication	10	1
BMI	34.4	26.8
HbA1C	8.15%	5.80%
Systolic blood pressure (mm Hg)	148	121
Triglycerides (mg/dl)	170.6	103.4
TC:HDL ratio	4.67	3.62

Avoid Diabetic Medications that Cause Weight Gain

- Insulin
- Amaryl (Glimepiride)
- Diabenese (Chlorpropamide)
- Glucotrol (Glipizide)
- Diabeta, Glynase (Glyburide)
- Actos (Pioglitazone)
- Avandia (Rosiglitazone)

More Drugs, More Deaths

On February 6, 2008 the National Heart, Lung, and Blood Institute (NHLBI), stopped the ACCORD Study (Action to Control Cardiovascular Risk in Diabetes)

Results showed that intensive treatment of diabetics (more meds to lower the glucose closer to normal) increases the risk of dying compared to those patients treated less aggressively.

John, 20 years later

At age 72 had significant chest pain with minimal activity

1994
Age 72

- Triple-vessel disease
- Hypertension
- On 3 medications
- BP 138/88



2014
Age 93

- No heart disease
- Normal blood pressure
- No medications
- Blood pressure 120/75

Julia, 10 years later

Could not walk one block

Before

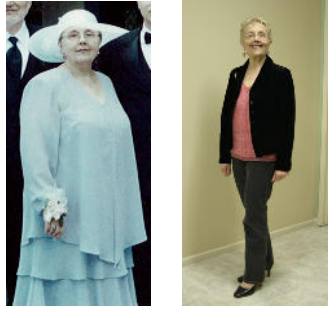
- 3 heart attacks in 3 months
- 5 angioplasties in 3 years
- 225 lbs
- 10 medications
- Could barely walk
- Never liked vegetables

Now

- Conquered toxic cravings
- Weighs 120 lbs
- Off medications
- Walks 3 miles everyday
- Able to enjoy natural flavors of food
- Kale is favorite vegetable

"I enjoy every day of my life now. I exercise. I garden. I cook. I do everything that I couldn't do for more than 10 years of my life. I look healthy. I feel healthy. It's good health from within. It's wonderful. I'm having a love affair with Dr. Fuhrman's nutritarian diet. You have to just do it. Keep your eyes on the prize."

"I lost **105 lbs** and went from a 'cardiac cripple' to a healthy, happy human being."



Ronnie Lost 140 lbs. in 12 Months!

"I would not want anyone to go through what I have had to endure in my struggle before I learned about Dr. Fuhrman. **DON'T WAIT** until you have a medical tragedy happen to you! Start your new life today!!!"



	July 2008	July 2009
Weight	300 lbs ¹	160 lbs
Blood pressure	161/110 (on meds)	115/70 (no meds)
Waist	58"	33"
Cholesterol	228 (on meds) ⁴	132 (no meds)
Triglycerides	312	63
LDL	148	75

More Representative Cases

Case One

50 year old male 183 pounds, BP 160/108. Unstable angina. Lost 30 lbs. within three months, BP → 130/80 first week, 8 weeks, he was able to jog without symptoms.. After one year, his weight remains at 154 lbs, His blood pressure is 112/75.

Case Two

44 year old male, weight 240, carotid artery 60-80 percent occluded as measured by carotid ultrasound, one year, half gone, two years completely gone.

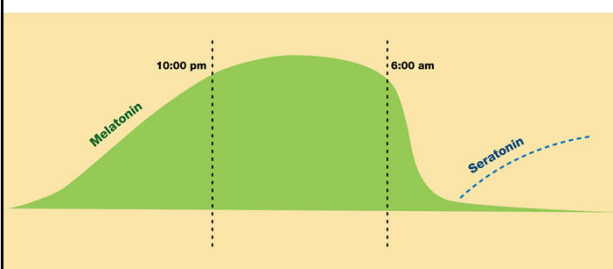
Case Three

55 year old male on one of the vegetarian programs for over 3 years while his carotid artery disease as measured by ultrasound, continued to worsen.

Case Four

66 year old male who developed atrial fibrillation after one year on a very low fat vegan diet, found to be fatty acid deficient and A-fib resolved with fatty acid replenishment.

Melatonin Cycle



Dr. Fuhrman
How to live, for life

Anti-Depressant Drugs and Publication Bias

January 17, 2008 New England Journal of Medicine

1. 74 studies reviewed by the FDA
2. Negative outcome studies not published
3. When all studies considered anti-depressants did only a little better than placebo.
4. Light therapy outperforms drugs in major depression. Arch Gen Psychiatry. Jan 2011

Lieverse R, et al. Arch Gen Psychiatry. 2011 Jan;68(1):61-70.
Golden, R.N., et al.. Am J Psychiatry, 2005. 162(4): p. 656-62.

Dr. Fuhrman
How to live, for life

Omega-3 insufficiency and depression

DHA deficiencies in depressed patients relative to healthy controls, consistent with impaired peroxisome function.

SSRI-resistant depression - remission of 40 % in low dose group and 100 % in high dose group

"Low omega-3 fatty acid status commonly observed in patients with MDD may reduce the effectiveness of SSRIs"

Results consistent with meta-analysis demonstrating patients demonstrating depression commonly associated with lower EPA and DHA levels



McNamara RK, et al J Affect Disord 2010;126(1-2):303-11.
McNamara RK, et al. PharmNutrition 2014;1:2(2):36-46

Zinc and Depression

- Meta-analysis → Lower zinc in blood in depressed individuals
- Zinc added to anti-depressant therapy produced more rapid and effective improvement
- Study evaluated 17 studies and 1643 depressed patients and 804 controls
- Most severe forms of depression had the lowest levels.

Swardfager W, et al. Biol Psychiatry 2013;74:872-878,

Anti-Depression Protocol

- Early morning light therapy
- High nutrient, vegetable-nut-fruit-based diet
 - 1 tablespoon ground flax or chia seeds daily
 - 1 ounce raw walnuts daily
- EPA/DHA with at least 500 of EPA daily
- No processed foods, no dairy, no



- Consider Saffron 30 mg twice daily

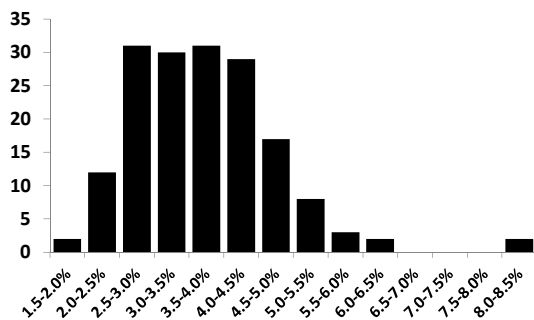
DHA and Dementia

Adequacy likely important if lifespan is enhanced

Low DHA = brain shrinkage with aging
Insufficiency increases risk of depression

Recent research on vegans showed :
64 % insufficient levels
27 % significantly deficient

Omega-3 index in vegans



Women's Health Initiative Memory Study

1,100 women followed 8 years

- greater DHA-EPA omega-3 index had larger total brain volumes at that time.
- 7.5% index level had larger brain volume compared to 3.4%
- with 2.7% larger volume in the hippocampus

Pottala JV, Yaff K, Robinson JG, et al. Higher RBC EPA + DHA corresponds with larger total brain and hippocampal volumes. Neurology. January 22, 2014

DHA Adequacy For Prevention Against Dementia

- More than a dozen epidemiological studies have reported that reduced levels of omega-3 fatty acids associated with increased risk for age-related cognitive decline or dementia such as Alzheimer's disease (AD).
- Increased dietary consumption or blood levels of docosahexaenoic acid (DHA). A number of critical trials have confirmed the benefits of dietary supplementation with omega-3 fatty acids not only in several psychiatric conditions, but also in inflammatory and autoimmune and neurodegenerative diseases.

DHA and Dementia References

Beydoun MA, et al. Plasma n-3 fatty acids and the risk of cognitive decline in older adults: the Atherosclerosis Risk in Communities Study. Am J Clin Nutr. 2007;85(4):1103-11.

Connor WE, Connor SL. The importance of fish and docosahexaenoic acid in Alzheimer disease. Am J Clin Nutr. 2007;85(4):929-30.

Kiecolt-Glaser JK, et al. Depressive Symptoms, omega-6:omega-3 Fatty Acids, and Inflammation in Older Adults. Psychosom Med. 2007 Mar 30; . 2007. PMID:17401057.

Mazza M, et al. Omega-3 fatty acids and antioxidants in neurological and psychiatric diseases: an overview. Prog Neuropsychopharmacol Biol Psychiatry. 2007;30(31(1)):12-26.

Cole GM, et al. Omega-3 fatty acids and dementia Prostaglandins, Leukotrienes and Essential Fatty Acids, Volume 81, Issues 2-3, August-September 2009, Pages 213-221.

van Gelder BM, et al. Fish consumption, n-3 fatty acids, and subsequent 5-y cognitive decline in elderly men: the Zutphen

Vitamin D and cognitive function in older adults

Low 25 (OH) D levels associated with worse global cognitive function and greater decline over time (4 years)

- Above 30 ng/ml insignificant decline
- 20 – 29 moderate decline
- Below 20 severe decline

Wilson VK, et al. J Am Geriatr Soc 2014;62(4):636-641

Low Vitamin D and Dementia

- 1700 elderly with 6 year follow up.
- 122% increased dementia in those who were severely deficient and 51% in those mildly deficient. compared with those with sufficient vitamin D.

Littlejohns TJ, Henley WE, Lang IA, et al. Vitamin D and the risk of dementia and Alzheimer disease. Neurology 2014 Aug; doi: 10.1212/WNL.0000000000000755. (ahead of print)

Extremely Low Fat Vegans

Taking risks for better health ?

1. Failure to thrive in children
2. Unsafe for pregnancy and nursing
3. Risk for depression and later life dementia
4. Less therapeutically effective, less longevity promoting.
5. More risky for patients with advanced heart disease
6. Turning people away-more ex-vegans

Nutritional Excellence Protects & Treats Disease

- Salads with seed-nut-based dressings
- Blended salad or veggie smoothies
- Soups with carrot/tomato juice and cruciferous vegetables
- Steamed green vegetables every night
- Animal products limited to 0 - 3 small servings per week
- No dairy, white flour, white rice
- Remove all processed foods, cold cereals and sweets
- No sweeteners, except fruit and limited one half cup dried fruit
- Supplements to consider:
