

# *The Essential Components of a Healthy Diet*

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## **1. THE TRUTH ABOUT FATS**



All fats are not bad fats, depending on the type of fat one consumes. In fact, fats play important roles in the human body, surrounding every cell in the human body, and are involved in proper development of the central nervous system, energy production and storage, oxygen transport, and regulation of inflammation.

Fats are usually a combination of the three basic fat classifications – saturated, monounsaturated, polyunsaturated. **Saturated fats** are solid at room temperature, have hydrogen molecule saturation at every carbon, and no double bonds. Lard, beef fat, butter, and coconut have high saturated fat percentages (41, 44, 66, 92%, respectively).<sup>i</sup> High intake of animal sources of saturated fats has been associated with increased cholesterol and cardiovascular disease.<sup>ii iii</sup> **Monounsaturated fats** are typically liquid at room temperature, and have one double bond that imparts both chemical stability and fluidity. Food sources of monounsaturated fats include olive oil, nuts, avocado, and sunflower oil. As the nomenclature implies, **polyunsaturated fats** have more than one, usually multiple, double bonds which give this class the greatest nutritional benefits, but on the other hand, make these fats more susceptible to rancidity and chemical conversion to unhealthy fats.

**Essential fatty acids** are fats that we must obtain from our diet, as our bodies cannot synthesize them. It is important to recognize that the two essential fatty acid families, omega-6 and omega-3's, are both polyunsaturated fats. However, they have opposing physiologic functions: omega-6 fats are PRO-inflammatory, while those of omega-3 fats are ANTI-inflammatory. On the omega-6 side, arachidonic acid leads to the production of the main proponents of the inflammatory cascade, prostaglandins and leukotrienes of the even-series (PGE<sub>2</sub>, LTE<sub>2</sub>, etc.). In contrast, omega-3 fatty acids have a more beneficial influence on inflammation. **Omega-3 fatty acids** lead to the production of anti-inflammatory prostaglandins of the one and three series (PGE<sub>1</sub> and PGE<sub>3</sub>) and less inflammatory leukotrienes. Since they compete for the same enzymes, the more omega-6 fatty acids we ingest, the less we are able to utilize the beneficial influences of the omega-3 fatty acids. Humans still require both omega-6 and omega-3 fats, but the optimal ratio is considered to be 2:1,<sup>iv</sup> based on our Paleolithic-era genetics. The problem is that the standard American diet has a ratio of 10:1 to 25:1 omega-6 to omega-3, thus grossly tipping the dietary balance towards inflammation and chronic disease. Diets high in omega-6 fatty acids shift metabolism towards arachidonic acid, and its subsequent metabolites that are prothrombotic and proaggregatory with increase in blood viscosity, vasospasm, and vasoconstriction.<sup>v</sup>

## **Facts on Fats**

### **OLIVE OIL**



1. High in antioxidants<sup>vi</sup> – tocopherol, hydroxytyrosol, and oleuropein—and in sterols which help reduce LDL and increase HDL
2. May also possess some NSAID-like activity<sup>vii viii</sup>
3. Extra virgin (or “first-press”) olive oil has been shown to have more health benefits than refined olive oil<sup>ix</sup>
4. A small study shows that extra virgin olive oil, but not regular olive oil nor corn oil, reduced leukotrienes (LTB4) and thromboxanes (TXB2) in human subjects.<sup>x</sup>

### **OMEGA 3:**



1. Fish (remember S.M.A.S.H: salmon, mackerel, anchovies, sardines and herring) are high in omega-3 fatty acids, especially anti-inflammatory EPA and DHA, that are less prone to conversion to pro-inflammatory cytokines.
2. Omega-3 fatty acids increase production of nitric oxide by 43% - promotes arterial relaxation<sup>xi</sup>
3. Very long chain n-3 fatty acids decrease risk of cardiac death by 30-45%<sup>xii</sup> Fish consumption of about 150 g (5.3 ounces) per week was associated with 38% lower odds of developing ACS as compared to no consumption.<sup>xiii</sup>
4. Endproduct, long-chain omega-3s – EPA (eicosapentanoic acid) and DHA (docosohexanoic acid) (found in fish oil)--are much more powerfully anti-inflammatory than their precursor, alpha-linolenic acid (ALA) (found in flax oil).
5. Omega 3 fats, especially EPA and DHA, have been shown in numerous studies to lower PGE2, thromboxane A2, LTB4, and increase anti-inflammatory PGI3, LTB5.<sup>xiv</sup>

**Bottom Line: Consume less saturated fat (lard, beef fat, butter), more monounsaturated fat (olive oil, nuts, avocado). Ensure that you get adequate omega 3: two servings of fatty fish per week, or liberally add flax, chia, hemp seeds in your diet.**

## **2. CARBS AND GLYCEMIC LOAD**



Carbohydrates are digested at different rates, explained by a term called the glycemic index. The higher the index, the more quickly the food gets absorbed and used as sugar. Excessive consumption of highly processed carbohydrates, e.g. white flour, refined sugars, with high glycemic load, cause abnormal surges in blood glucose and insulin levels. Dietary fiber – both soluble and insoluble – effectively slows digestion, and thus the glycemic load, and reduces oxidant stress and inflammation. Whole grains contain fiber, lignans, magnesium, zinc, B vitamins, and vitamin E that may help control

inflammation. A recent study supports an inverse relationship between dietary fiber and risk of elevated CRP; greater protection was seen at total fiber level > 22 grams/day.<sup>xv</sup> The active phytochemicals in whole grains are concentrated in bran and the germ; refining wheat, for example, causes a 200-300 fold loss in phytochemicals!<sup>xvi</sup>

### **Facts on Carbs:**

1. One recent study<sup>xvii</sup> of 522 diabetic patients showed that including 15 grams of dietary fiber for every 1000 calories daily with lifestyle changes (moderate exercise) significantly reduced CRP by 27%.
2. Diets rich in unprocessed, natural plant foods such as the Okinawan or Mediterranean diets, have lower GL, substantially lower post-prandial glucose levels and are associated with improved cardiovascular health and longevity.<sup>xviii</sup>

**Bottom line: Choose carbs that are whole grain (requires chewing!), and aim for total of 25 grams of fiber per day.**

### **3. HOW ABOUT THOSE FRUITS AND VEGGIES**



We have all heard to eat more fruits and vegetables, 5-9 servings a day. But, it is estimated that Americans only consume 1.5 servings of vegetables per day, and only one fruit per day.<sup>xix</sup> Only 1 in 11 Americans consumes at least 3 servings of vegetables and 2 servings of fruit per day. Even more sadly, is that up to 2/3 of this is fried potato products, or iceberg lettuce.<sup>xx</sup>

Vegetables contain the highest concentrations of vitamins, minerals, and other protective phytochemicals, with a lower caloric density compared to other foods. Rich in biochemical complexity, whole vegetables and fruit are superior to any single isolated nutrient. Citrus fruit for example, contains not just vitamin C, but some 60 flavonoids, 20 carotenoids, plus limonoids.

### **F & V Facts:**

1. Higher consumption of fruit and vegetables was significantly associated with a lower risk of all cause mortality.<sup>xxi</sup> The threshold amount was 5 servings of vegetables and fruit per day.
2. High intake of vegetables and fruit, greater than 5 servings per day, has a significant inverse dose-response association with inflammatory markers such as CRP, IL-6 and adhesion factors.<sup>xxii xxiii xxiv</sup>
3. Tomatoes contain lycopene, a potent antioxidant, associated with decreased risk of cancer – especially prostate, lung, and stomach<sup>xxv</sup> (of note, Serum lycopene increases 82% when tomatoes are cooked in olive oil<sup>xxvi</sup>)
4. Review of 200 studies shows that low fruit intake (bottom quartile) is associated with doubled increase risk of cancer<sup>xxvii</sup>

5. Fruit/vegetable consumption also associated with beneficial effect on blood pressure<sup>xxviii</sup>

**Bottom Line: Increase intake of vegetables and fruit to 5-9 servings (handfuls) a day with various deeply colored items that contain higher phytochemicals!**

#### **4. PROTEIN—HOW MUCH DO WE REALLY NEED?**

Protein consumption should equal about 8 grams of protein daily for every 20 pounds of body weight, which means 50 grams of protein daily for an average woman and 65 grams for an average man. For example, a cup of low-fat yogurt has 11.9 grams of protein and a 6 ounce serving of roast chicken has 42.5 grams; together, that is about 55 grams of protein, more than enough for the average woman.



Protein does not only come from animal sources. Legumes and nuts are great sources of protein with less fat! Legumes are high in protein, fiber, iron, folic acid and B vitamins. An ounce of almonds, walnuts, peanuts, or pistachios gives you about 8 grams of protein, the same as a glass of milk. Most legumes are deficient in the essential amino acids methionine and tryptophan, but luckily these are found in sufficient amounts in most grains. A combination of beans, nuts, grains, and vegetables (for example, rice and beans, peanut butter and whole grain bread, tofu and brown rice) can ensure that all the amino acids are consumed.<sup>xxix</sup>

#### **Nuts and Seeds Facts:**

1. Five or more servings of nuts and seeds per week was associated with lower levels of CRP, IL-6 and fibrinogen in a multi-ethnic study including over 6000 patients.<sup>xxx</sup>
2. Increased legume consumption associated with decreased coronary heart disease<sup>xxxi</sup> (med diet)
3. In the Nurses' Health study of 83,000 women, those who consumed peanut butter >5 times a week, had a 21% lower risk of developing diabetes compared to those who never ate peanut butter.<sup>xxxii</sup>

**Bottom Line: Consume a variety of different proteins to get all the amino acids, and try to consume 50% plant based (beans, nuts, grains, vegetables), while limiting red meat to two servings per week.**

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#### **RESOURCES**

<sup>i</sup> Source: Becoming Vegetarian. Melina V, Davis B, Harrison V. Book Publ Co., 1995.

<sup>ii</sup> Hu FB, Stampfer MJ, Manson JE, et al. Dietary Fat Intake and the Risk of Coronary Heart Disease in Women N Engl J Med 1997; 337:1491-1499

<sup>iii</sup> Hu FB, Manson JE, Willett WC. Types of Dietary Fat and Risk of Coronary Heart Disease: A Critical Review. J Am Coll Nutr 2001; 20(1): 5-19

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- <sup>iv</sup> Simopoulos AP, Essential fatty acids in health and chronic disease. *Am J Clin Nutr.* 1999;70(suppl):560S-9S.
- <sup>v</sup> Simopoulos AP. Omega-3 fatty acids in health and disease and in growth and development. *Am J Clin Nutr.* 1991 Sep;54(3):438-63.
- <sup>vi</sup> Fito M, et al. *Molecular Nutrition & Food Research.* 51(10):1215-24, 2007
- <sup>vii</sup> Beauchamp GK, et al. *Nature* 2005; 437:45-6
- <sup>viii</sup> Visioli F, et al. *Current Atherosclerosis Reports.* 3(1):64-7, 2001 Jan
- <sup>ix</sup> Fito M, et al. The members of the SOLOS Investigators. *Atherosclerosis* 181(1):149-58, 2005.
- <sup>x</sup> Bogani P, Galli C, Villa M, Visioli F. Postprandial anti-inflammatory and antioxidant effects of extra virgin olive oil. *Atherosclerosis* 2007;190(1):181-86.
- <sup>xi</sup> *Amer J Clin Nutr* 1997; 65: 459-64.
- <sup>xii</sup> de Lorgeril M, et al. *Public Health Nutrition.* 9(1A):118-23, 2006 Feb.
- <sup>xiii</sup> Panagiotakos DB, et al. *Intl J Cardiol* 102(3):403-9, 2005.
- <sup>xiv</sup> Simopoulos AP. Omega-3 fatty acids in inflammation and autoimmune diseases. *J Am Coll Nutr.* 2002 Dec;21(6):495-505.
- <sup>xv</sup> Ma Y, Griffith JA, Chasan-Taber L, et al. Association between dietary fiber and serum C-reactive protein. *Am J Clin Nutr* 2006;83(4):760-6.
- <sup>xvi</sup> Thompson LU. Potential health benefits of whole grains and their components. *Contemp Nutr* 1992;17(6):1-2.
- <sup>xvii</sup> Herder C, Peltonen M, Koenig W, et al. Anti-inflammatory effect of lifestyle changes in the Finnish Diabetes Prevention Study. *Diabetologia* 2009;52:433-42.
- <sup>xviii</sup> Lichtenstein A, Appel L, Brands M, et al. Diet and lifestyle recommendations revision 2006: a scientific statement from the American Heart Association Nutrition Committee. *Circulation* 2006;114:82-96.
- <sup>xix</sup> Craig W. Phytochemicals: guardians of our health. *J Am Diet Assoc* 1997;97(suppl s): S199-S204.
- <sup>xx</sup> *Harvard Mens Health Watch.* 7(6):1-5, Jan 2003.
- <sup>xxi</sup> Wang X, Ouyang Y, Liu J, et al. *BMJ.* 2014;349:g4490. Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: systematic review and dose-response meta-analysis of prospective cohort studies.
- <sup>xxii</sup> Nanri A, Yoshida D, Yamaji T, et al. Dietary patterns and C-reactive protein in Japanese men and women. *Am J Clin Nutr.* 2008 May;87(5):1488-96.
- <sup>xxiii</sup> Gao X, Bermudez OI, Tucker KL. Plasma c-reactive protein and homocysteine concentrations are related to frequent fruit and vegetable intake in Hispanic and non-Hispanic white elders. *J Nutr.* 2004;134:913-8.
- <sup>xxiv</sup> Esmailzadeh A, Kimiagar M, Mehrabi Y, et al. Fruit and vegetable intakes, C-reactive protein, and the metabolic syndrome. *Am J Clin Nutr* 2006; 84(6):1489-97.
- <sup>xxv</sup> Giovannucci E. *J Natl Cancer Inst.* 1999;91:317-331.
- <sup>xxvi</sup> Fielding JM, et al. *Asia Pacific J Clin Nutr* 14(2):131-6, 2005.
- <sup>xxvii</sup> Block G, et al. *Nutrition and Cancer* 1992;18:1-29.
- <sup>xxviii</sup> Alonso A, et al. *British Journal of Nutrition.* 92(2):311-9, 2004.
- <sup>xxix</sup> Katzen M, Willet W. *Eat, Drink, and Weigh Less.* 2006: 59-63
- <sup>xxx</sup> Jiang R, Jacobs DR Jr, Mayer-Davis E, et al. Nut and seed consumption and inflammatory markers in the multi-ethnic study of atherosclerosis. *J Epidemiol* 2006;163(3):222-31.
- <sup>xxxi</sup> Bazzano LA, et al. *Arch Intern Med.* 2001 Nov 26;161(21):2573-8.
- <sup>xxxii</sup> Jiang, R. *Journal of the American Medical Association,* 2003 from *Eat, Drink, and Weigh Less.* Katzen M, Willet W. 2006: page 63

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## ***FIVE INGREDIENT RECIPES*** (plus salt/pepper/olive oil!)

### **Raw Kale Salad**

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Kale, loaded with protective phytochemicals, is on the top of the list for foods with high nutrition density. It is easy to chop up and add to a variety of soups, stir-frys and salads. Here's one recipe that doesn't require cooking.

One bunch raw kale (try white or red Russian kale, less bitter)

1 ripe avocado

Extra virgin Olive oil – enough to moisten

1 tbsp of Nutritional yeast

Pinch sea salt

½ teaspoon cumin powder

Dash cayenne, or smoked Spanish paprika (optional)

Remove the center 'rib' from kale leaves. Stack kale leaves on top of each other and roll up like a cigar. Slice across the kale 'cigar' to form fine strips – easier to eat raw when cut finely.

Placed kale ribbons in bowl, mash in avocado, adding enough olive oil (about 2 teaspoons) to moisten. Season as desired with salt, pepper, cayenne and optional nutritional yeast.

### **Easy Miso-Broiled Salmon**

This omega-3 rich salmon entrée is not only tasty, but takes only minutes to prepare a sure-fire hit for guests! Leaving the skin on the salmon and coating the fillet side with miso helps to prevent moisture loss under high heat of broiler. The optional brown sugar helps to caramelize the miso crust, thus creating an aesthetically pleasing look.

1 ½ lb wild salmon fillets, cut into six 4-ounce portions, skin on.

¼ cup white miso

1 tbsp + 2 tsp mirin (Japanese sweet cooking wine)

1 tbsp freshly grated ginger

1 tsp brown sugar

Optional garnish: 2 scallions – thinly sliced, both white and green portions

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Set oven to broil. After rinsing, pat-dry salmon fillets and place **skin-side up** on foil-lined baking sheet or glass baking dish. Mix miso, mirin, and ginger in a small bowl to make a thick, but spreadable paste – you can add the extra mirin to thin to desired consistency. Place salmon under broiler for about 4 -5 minutes; you should see salmon turning opaque about 2/3 up the sides. Remove sheet of salmon from oven and flip each fillet over carefully with spatula. Spread about 1 tablespoon of miso mixture evenly over each fillet. Sprinkle pinch of optional brown sugar lightly over miso topping if you desire maximal browning of topping. Return to broiler for another 3 minutes until fish is done but still moist inside. Miso mixture should be bubbling and peaks start to turn dark brown. Remove from oven and garnish with optional sliced scallions.

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### **Orange Prune Compote & Greek Yougurt**

1 orange, zested  
1 bag (16 oz) non-sorbate prunes  
8 ounces Greek yougurt  
1 teaspoon Cinnamon, ground

Pour 3 cups boiling water over prunes, cover and soak overnight. Drain off excess water. Use microplane grater to zest the orange. Place prunes, orange zest and cinnamon in food processor. Pulse briefly 2 -3 times; you want to blend to a thick, very chunky consistency.

Spoon ¼ cup of prune compote in serving glass. Top with 1 tablespoon yougurt; dust with additional cinnamon. Enjoy as a sweet, but healthy treat. Can also serve over sliced pears, in season.

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For other great patient –friendly recipes, check out “*Let’s Cook/ Vamos a Cocinar*” 3rd edition. Northeast Valley Health Corporation WIC program, CA Dept of Health, 2010. Available through WIC offices in California.