



University of Michigan Health System

University of Michigan Integrative Medicine

Healing Foods Pyramid™



Healthy Fats are included in the Healing Foods Pyramid™ as part of a balanced, whole foods, plant-based diet. This Food Pyramid emphasizes foods that nourish the body, sustain energy over time, contain healing qualities and essential nutrients, and support a sustainable environment.



What are the recommended servings per day?

- 3-9 servings per day (see serving sizes below)

What are the different types of healthy fats and oils?

- Fats and oils are made up of basic units called fatty acids. Each type of fat or oil is a mixture of different fatty acids.
- **Monounsaturated Fatty Acids (MUFA)** are found mainly in vegetable oils, nuts, seeds, olives and avocados. They are liquid at room temperature.
- **Polyunsaturated Fatty Acids (PUFA)** are found mainly in vegetable oils, fish and seafood. They are liquid or soft at room temperature. Omega-3 and omega-6 fatty acids are types of PUFA and are considered essential fatty acids because our bodies cannot make them, thus they must be obtained through the diet.
- **Saturated Fatty Acids** are usually solid at room temperature and are found mainly in foods from animal sources like meat, and dairy products, like butter and cheese. Some vegetable oils such as coconut, palm kernel and palm oil also contain saturated fat.
- **Trans Fatty Acids** are liquid vegetable oils that have been chemically processed to become semisolid at room temperature through the addition of hydrogen atoms. Trans fatty acids, also called “partially hydrogenated” oils, are used in some margarines, fried foods, and

process snack foods to improve the flavor, texture and shelf-life .

- Conjugated Linoleic Acid (CLA) is a naturally occurring trans fatty acid found in the meat and dairy products of ruminant animals (such as cows, sheep, goats, and deer), as well as eggs. CLA is not associated with the negative health impacts of artificially produced trans fatty acids and may impart some health benefits, though current research findings are controversial. CLAs are not included in the trans fatty acid listing on a nutrition label.

Why choose healthy fats like MUFA and omega-3s?

- They provide antioxidants such as vitamin E and selenium
- Small amounts of healthy fats help the body absorb vital nutrients, including fat soluble vitamins (A, E, D, K) from other whole foods
- Including healthy fatty acids in your diet in appropriate quantities can help prevent and treat: diabetes, heart disease, cancer, obesity, musculo skeletal pain, and inflammatory conditions
- Some research suggests that diets including MUFA can have a beneficial effect on cholesterol, blood pressure, blood clotting and inflammation
- Omega-3 fatty acids are necessary for proper brain growth and development. They are anti-inflammatory and may be helpful in the prevention and treatment of many diseases.

Why limit saturated fats, trans-fats and omega-6 fatty acids?

- Saturated fat eaten in excessive amounts is the main culprit in raising total and LDL (“bad”) cholesterol, which can increase risk of heart disease.
- High saturated fat intake may also contribute to increasing the risk of obesity, diabetes, and cancer.
- Trans fatty acids act like saturated fats in the body and raise LDL cholesterol levels. Unlike saturated fats, trans fatty acids also lower HDL (“good”) cholesterol. Additionally, trans fatty acids may increase risk and incidence of type 2 diabetes, and may compromise fetal and early infant growth and development.
- Omega-6 fatty acids are essential PUFAs found in vegetable oils commonly used in processed foods containing corn, safflower, and soybean oils. While omega-6 fatty acids are necessary for a balanced diet, we often consume them in overabundance.
- Consuming significantly more omega-6 fatty acids than omega-3 fatty acids, like most American’s do, contributes to an increased risk of chronic diseases and promotes inflammation.

Selected Sources of MUFA with Serving Sizes

(Listed highest to lowest MUFA content)

Oils (serving size: 1 tsp)	Nuts (serving size)	Seeds (serving size)	Butters (serving size)	Other (serving size)

Olive oil	Macadamias (2-3)	Sesame seeds (1 Tbsp)	Almond butter (½ Tbsp)	Avocado (2 Tbsp or 1 oz)
Canola oil	Hazelnuts (5)	Pumpkin seeds (47 seeds)	Cashew butter (½ Tbsp)	Black olives (8)
Peanut oil	Pecans (5 halves)	Ground flaxseed (1 Tbsp)	Peanut butter (½ Tbsp)	Green olives (10)
Sesame oil	Almonds (7)	Sunflower seeds (3 Tbsp)	Tahini/sesame paste (2 tsp)	
Walnut oil	Cashews (6)		Sunflower seed butter (2 tsp)	
Soybean oil	Pistachios (17)			
Flaxseed oil	Brazil nuts (2)			
Grape seed oil	Peanuts (9)			
Mustard oil	Pine nuts (50)			
	Walnuts (4 halves)			

Selected Plant Sources of Omega-3 Fatty Acids

(listed highest to lowest omega-3 content)

Oils (serving size : 1 teaspoon)	Nuts and seeds (serving size)
Flaxseed oil*	Flaxseeds (1 Tbsp)
Walnut oil	Walnuts (4 halves)
Canola oil	Pecans (5 halves)
Soybean oil	Pine nuts (50)
*Should be consumed raw and not used in cooking	

Although some of the omega-3s from plant sources alpha-linolenic acid (ALA) do convert into the longer chain omega-3 fatty acids, eicosapentanoic acid (EPA) and docosahexanoic acid (DHA), this conversion process is inefficient. Therefore, while plant sources of omega-3s do confer some

anti-inflammatory benefits, the impact is likely not as potent as EPA and DHA from animal sources. (*Please visit the **Fish & Seafood** section for more information about other sources of omega-3 fatty acids.*)

Flaxseed Facts

Flaxseeds are an oilseed just like canola and sunflower are oilseeds. Research has found that flax seeds in the diet have anti-inflammatory properties, help regulate blood sugar, and contribute to reducing LDL (“bad”) cholesterol.

- Rich plant source of omega-3 fatty acids
- Good source of fiber
- Contain other beneficial plant nutrients called lignans; research shows that a diet that contains lignans may reduce the risk of several types of cancer, heart disease and osteoporosis
- Lignans may also reduce inflammation in the body
- Using ground flax meal or grinding flaxseeds in a coffee grinder is necessary to make omega-3s available to our bodies
- Do not cook with flax seed oil, as subjecting it to heat produces oxidated by-products that may be harmful
- For ideas on how to incorporate flaxseed oil into your diet see the *Ideas to balance your fat consumption* section below.

Specific Considerations

Calorie-controlled high-MUFA diets:

- Do not promote weight gain
- Are more suitable than low-fat diets for weight loss in obese people because they provide greater satiety for longer periods of time, making it easier to stick to the diet
- High-MUFA diets may help regulate blood sugar and metabolism after a meal
- Are a substitute for low-fat diets for medical nutrition therapy in diabetes

What is the daily recommended intake of omega-3 fatty acids?

There are currently no established guidelines regarding optimal omega-3 intake. According to the Institute of Medicine, the Adequate Intake (AI) is 1.1g daily for women and 1.6 g daily for men. However, some experts believe that these recommendations might be too low to obtain the health benefits associated with omega-3s. Research shows benefits associated with higher intake of 2-3 g per day. The American Heart Association recommends 1-3 g per day for individuals to achieve the heart healthy benefits and reduce the risk of Coronary Heart Disease.

Why is your omega-6 to omega-3 fatty acid ratio important?

Two types of fatty acids that are essential for human health are omega-3 and omega-6. Studies suggest that decreasing the ratio of omega-6 (in vegetable oils) to omega-3 fatty acids (in fatty fish and some vegetable oils) is important to reduce risk of cancer, heart disease, inflammatory conditions, and depression.

Most people consume too many omega-6 fatty acids and consume too little omega-3 fatty acids. The average intake of omega-6 fatty acids relative to omega-3 fatty acids in the Western diet is about 20:1. To reduce your risk of chronic disease, reduce your intake of omega-6 fatty acids and increase your intake of omega-3 fatty acids.

Research suggests that a ratio of 4:1 is recommended for cardiovascular benefits and a ratio of 2:1 is recommended for decreasing risk of some cancers.

Know Your Limits for Fat

- Most people consume too much saturated fat and omega-6 fatty acids, and not enough monounsaturated or omega-3 fatty acids, it is important to consume a variety of fats to achieve a healthy balance.

Ideas to Balance Your Fat Consumption

1. All foods containing fat have a mixture of polyunsaturated, monounsaturated, and saturated fatty acids. It is not feasible, nor desirable to try to eliminate one type of fatty acid from your diet.
2. Choose salad dressings that use olive, canola, walnut or flaxseed oils as a base.
3. Add avocados, nuts, or olives to salads instead of high saturated fat animal foods like cheese, butter and meat.
4. For a snack, opt for a small handful of nuts/seeds each day in place of highly processed and high fat choices including chips, pastries, and cookies.
5. Use olive and canola oils for most cooking. Peanut and sesame oils can be used in Asian cooking.
6. To increase plant sources of omega-3s, choose walnuts, ground flaxseed and uncooked flaxseed oil.
7. Flax seed oil is a delicious butter alternative. Try adding it to baked potatoes, cooked grains and vegetables.
8. Add a tablespoon or two of ground flax seeds or flax meal to smoothies, muffins, bread or any other home-made baked item.
9. Never use oils, seeds or nuts after they begin to smell or taste rank or bitter. This is a sign that the oil has begun to turn rancid through a harmful oxidation process.
10. For high temperature sautéing or frying, use oils with a high smoke point, like canola oil.
11. Choose omega-3 enriched eggs, milk, cheese and meat from grass-fed beef, which contain more omega-3s than conventional varieties.
12. Be wary of any foods deep fried in restaurants. Deep fried foods may say “fried in vegetable oil”, but it is often hydrogenated vegetable oil.
13. A food item may contain less than 0.5 grams of trans fat per serving but still reflect “0” grams of trans fat on its food label. To ensure that the foods you eat are actually free of trans fat, check that hydrogenated and partially hydrogenated vegetable oils are not listed as ingredients.
14. Be aware: products are allowed to be labeled “trans-fat free” if there is less than 0.5 g of trans fat per serving, but the trans fat is still there. Check ingredient labels for the best information.

Resources

A Primer on Fats and Oils

American Dietetic Association

www.eatright.org

Accessed August 5, 2009

Face the Fats

Nutrition Action Health Letter, July/August 2002

www.cspinet.org/nah/07_02/fats.pdf

Accessed August 5, 2009

Fish and Omega-3 Fatty Acids

American Heart Association

<http://www.americanheart.org>

Accessed August 5, 2009

Omega-3 and Food for Thought: How Do I Get Flax in My Diet

Dixon, Suzanne

www.cancer.med.umich.edu/news/pro00fa10.shtml

Accessed August 5, 2009

Nutrition in 1 Ounce of Tree Nuts and Peanuts

International Tree Nut Council Nutrition Research & Education Foundation

www.nuthealth.org

Accessed August 5, 2009

Omega-3 Fatty Acids

University of Maryland Medical Center

<http://www.umm.edu>

Accessed August 5, 2009

Omega-3 Fats for Health and Well-Being

Karst, Karlene

Nutrition in Complementary Care: a Dietetic Practice Group of the American Dietetic Assn. (DIFM Articles)

www.complementarynutrition.org

Accessed August 5, 2009

Questions and Answers about Trans Fat Nutrition Labeling

American Dietetic Association

www.eatright.org

Accessed August 5, 2009

Original Research and Review Articles

Beauchamp GK, et al. **Ibuprofen-like activity in extra-virgin olive oil.** *Nature.* 2005;437:45-46

Blomhoff R, et al. **Health benefits of nuts: potential role of antioxidants.** *British Journal of Nutrition.* 2006; 96 (suppl); 52s-60s.

Calder PC. **Polyunsaturated fatty acids and inflammation.** *Prostaglandins, Leukotrienes and Essential Fatty Acids.* 2006

Calder PC. **Polyunsaturated fatty acids, inflammatory processes and inflammatory bowel diseases.** *Molecular Nutrition and Food Research.* 2008; 52: 885-897.

Cetin I, et al. **Long chain n – 3 fatty acid supply in pregnancy and lactation.** *Current Opinion in Clinical Nutrition and Metabolic Care.* 2008; 11: 297-302.

Chapkin RS, et al. **Dietary docosahexaenoic and eicosapentaenoic acid: emerging mediators of inflammation.** *Prostaglandins Leukotrienes and Essential Fatty Acids.* 2009; doi: 10.1016/j.plefa.2009.05.010

Davis, et al, **Achieving optimal essential fatty acid status in vegetarians: current knowledge and practical implications.** *American Journal of Clinical Nutrition.* 2003;78(suppl): 640s-6s.

De Caterina R, et al. **Nutritional mechanisms that influence cardiovascular disease.** *American Journal of Clinical Nutrition.* 2006;83(suppl):421s-426s.

Ding H, et al. **Chemopreventive characteristics of avocado fruit.** *Seminars in Cancer Biology.* 2007; 17: 386-394.

Erkkila, et al. **Dietary fatty acids and cardiovascular disease; An epidemiological approach.** *Progress in Lipid Research.* 2008; 47 : 172-187.

Hibbeln JR, et al. **Healthy intakes of n-3 and n-6 fatty acids: estimations considering worldwide diversity.** *American Journal of Clinical Nutrition.* 2006; 83(suppl): 1483s-93s.

Lombardo YB, et al. **Effects of dietary polyunsaturated n-3 fatty acids on dyslipidemia and insulin resistance in rodents and humans. A review.** *Journal of Nutritional Biochemistry.* 2006;17:1-13.

Makrides, M. **Outcomes for mothers and their babies: do n-3 long-chain polyunsaturated fatty acids and seafoods make a difference?** *Journal of the American Dietetic Association.* 2008; 108 (10): 1622-1626.

Odegaard AO, et al. **Trans Fatty Acids, Insulin Resistance, and Type 2 Diabetes.** *Nutrition Reviews.* 2006; 64(8): 364-372.

Pan A, et al. **Meta-analysis of the effects of flaxseed interventions on blood lipids.** *American*

Journal of Clinical Nutrition. 2009; 90: 288-297.

Rees AM, et al. **Omega-3 deficiency associated with perinatal depression: Case control study.** *Psychiatry Research*. 2009; 166:254-259.

Ros E. **Dietary cis-monosaturated fatty acids and metabolic control in type 2 diabetes.** *American Journal of Clinical Nutrition*. 2003; 78(suppl):617s-625s.

Ruano J, et al. **Phenolic content of virgin olive oil improves ischemic reactive hyperemia in hypercholesterolemic patients.** *Journal of the American College of Cardiology*. 2005; 46(10):1864-1868.

Simopoulos AP. **Essential fatty acids in health and chronic disease.** *American Journal of Clinical Nutrition*. 1999; 70(suppl): 560s-569s.

Simopoulos AP. **Human requirement for n-3 polyunsaturated fatty acids.** *Poultry Science*. 2000; 79(7):961-970.

Simopoulos AP. **Omega-3 fatty acids in inflammation and autoimmune diseases.** *Journal of the American College of Nutrition*. 2002; 21(6):495-505.

Simopoulos AP. **The Importance of the Omega-6/Omega-3 Fatty Acid Ratio in Cardiovascular Disease and Other Chronic Diseases.** *Experimental Biology and Medicine*. 2008; 223(6): 674-88.

Simopoulos AP. **The importance of the ratio of omega-6/omega-3 essential fatty acids.** *Biomedical Pharmacotherapy*. 2002; 56:365-379.

Smith KM, et al. **Relationship between fish intake, n-3 fatty acids, mercury and risk markers of CHD** (National Health and Nutrition Examination Survey 1999-2002). *Public Health Nutrition*. 2008; 12 (8): 1261-1269.

Tsubura A, et al. **Dietary factors modifying breast cancer risk and relation to time of intake.** *Journal of Mammary Gland Biology and Neoplasia*. 2005;10(1): 87-100.

Valensi P. **Hypertension, single sugars and fatty acids.** *Journal of Human Hypertension*. 2005; 19:5s-9s.

Webb AL, et al. **Dietary lignans: potential role in cancer prevention.** *Nutrition and Cancer*. 2005;51(2): 117-131.

The *Healing Foods Pyramid*[™] was created by the Nutrition Education Team at the University of Michigan Integrative Medicine, Department of Family Medicine in 2005 and updated in 2009.

Back to top

© copyright 2010 Regents of the University of Michigan - University of Michigan Integrative Medicine

Monica Myklebust, M.D. and Jenna Wunder, M.P.H., R.D. For questions and licensing information please call 734-998-7874 or email umim-hfp@umich.edu.

University of Michigan Health System, 1500 E. Medical Center Drive Ann Arbor, MI 48109 734-936-4000

© copyright 2012 Regents of the University of Michigan / Template developed & maintained by: Public Relations & Marketing Communications. Contact UMHS



The University of Michigan Health System Web site does not provide specific medical advice and does not endorse any medical or professional service obtained through information provided on this site or any links to this site. Complete disclaimer and Privacy Statement